

ACTION PLAN

RAMAPURAM RIVER

(PRIORITY- V)

DISTRICT LEVEL TECHNICAL COMMITTEE

Kerala State Pollution Control Board

Irrigation Department

Kerala Water Authority

Suchithwa Mission

Madayi Grama Panchayath

Pariyaram Grama Panchayath

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CHAPTER 1

INTRODUCTION

General

Backgro

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Ramapuram river is the smallest stream in Kannur district. It has 19 Kms length and it has its source in the laterite hills coming in the village limits of IringalinPariyarampanchayath at an elevation of 385 m. Navigable length of the river is 6.4 Km and Basin area 52 Km². The Ramapuram River drains in to the Kavvayi backwaters. The river flows through the villages of Pariyaram, Kolapratvayal, Cheruthazham and Madayi. It is overlooking Payangadi town on the northern bank of KuppamRiver.

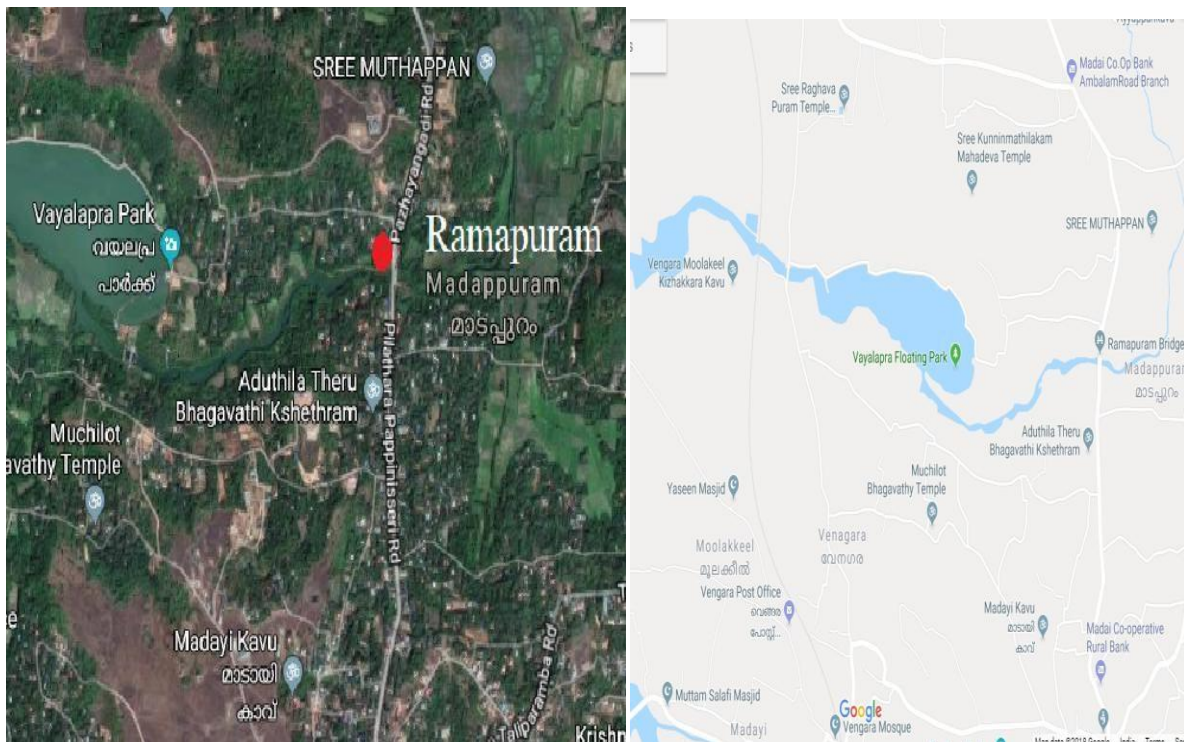


Fig 1.1 Map of Ramapuram River

Physiography of the Basin

This small river rises from a hillock near Pariyaram and flows through Ezhilode and Kunhimangalam and joins Arabian Sea a little north of Madayi. Adjacent areas of the identified stretch are mainly occupied by Paddy fields, Coconut and Areca nut palms. The Ramapuram river basin is located between 12.046° to 12.060° North latitude and 75.265° to 75.303° East longitudes. It has a length of 19 km. The small river flowing through Embettugets diverged into two at Palottukavu, and continue as Ramapuram River and Muttom river.

Land Use Pattern

The land use pattern is mainly agriculture/residential. Majority of the population depends on agriculture for livelihood. The river flows through the midland and coastal region. Paddy, Coconut, Areca nut, Tapioca and Pepper are the cultivating in the midlands. Towards the lower stretches the river is used for fishing activities.

Climate and Rain Fall

Kannur experiences humid tropical monsoon climate in the district. Relative humidity is more during south west monsoon season from period of June to September. It is more during morning hours and is less during evening hours. Evaporation is more during summer months of March to May and low during the months of June to November. Rain fall is the only source of fresh water and it records wide spatio-temporal variations in its availability. Once the rain water reaches surface of the earth and start flowing either as surface run off or infiltrates to recharge ground water the entire process is subject to land and land use management. Based on rainfall and clouding characteristics four seasons can be identified in Kerala, the South- West monsoon (June to September), North-East monsoon (October and November), Winter (December-February) and Pre-monsoon (March-May). Kannur district receives a total annual rainfall of 3438 mm. District experiences heavy rainfall during the South West monsoon season followed by North East monsoon. South West monsoon during June to September contributes 70 % of the total rainfall of the year. The northeast monsoon contributes only about 30%.

CHAPTER 2

STUDY AREA OF RAMAPURAM RIVER

The Study Area

The river stretch from its origin near Iringalin Kannur district is selected for our study. The river flows through villages of Pariyaram, Cheruthazham and Madayi .Major part of the river is through Cheruthazham village. The panchayaths through which it flows are Pariyaram, Cheruthazham and Madayi. Monthly monitoring of water quality of the river is conducting for years under the National Water Quality Monitoring Programme (NWMP) at Ramapurambridge(Station Code: 2299)near Pazhayangadi town in Kannur district.

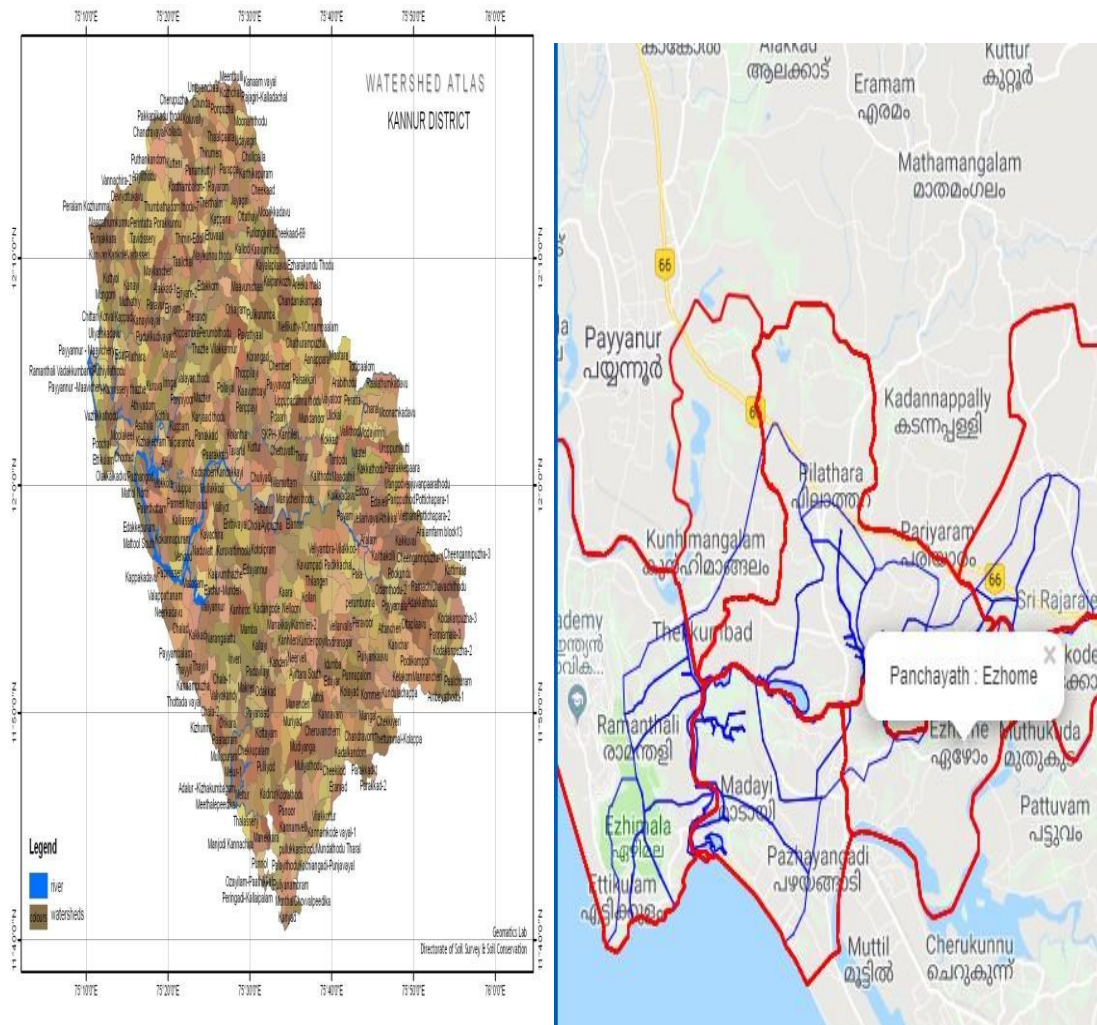


Fig 2.1 Watershed map of Ramapuramriver

The details of panchayats and municipality through which the river flows is as follows ;

Sl No.	Panchayat/Municipality	Taluk	Population (as per 2011 census)
1	Cheruthazham	Taliparamba	26240
2	Pariyaram	Taliparamba	33011
3	Madayi	Taliparamba	33488

Table 2.1: Municipality and Panchayat details

Identified points and causes of pollution

Polluting sources of industrial origin are not identified near to the river stretch. The townships in the panchayat as well as in the municipal area situated away from the river bed and direct discharge of sewerage and sewage noticed. The main activities in the GramaPanchayats of Pariyaram, Cheruthazham and Madayi are in the agricultural sector. Paddy, Coconut, Areca nut etc. are the main crops cultivated. Domestic pollution is the main source of contaminants in the entire stretch. There are places along the river side where dumping of wastes are seen. All kinds of waste materials like plastics, glass bottles, construction debris. Waste dumping in the main river as well as in the streams joining the river adversely affects its water quality.

Motor boats: Boats can affect water quality in a few different aspects. First, they can add metals and chemicals to the water column. Two stroke motors can emit 25-30% of their unburned gas and oil mixture into the water. In contrast, four-stroke motors emit 97% less air and water pollution than old two-stroke motors

Pollution risks from boats : Sewage disposal ,Litter, Cleaning, painting and anti-fouling, Oil, fuel, contaminated bilge waters

The advice below can help you to minimize your risk of polluting the water.

Diesel or oil is damaging to marine life. Make sure it's not released into the water:

Quarrying from river side



Fig 2.6: Unauthorized quarrying soil from river side VayalpraParappu

Impacts related to quarrying activities on and near the river, such as vibrations, land degradation, land subsidence and landslides, water pollution, occupational noise pollution, and air pollution, will lead to health-related problems and loss of biodiversity. Quarrying operations can adversely alter pre-existing ecosystems, and change hydro geological and hydrological regimes. This adverse influence of stone and sand quarrying induces damage in property, depletion of ground water, loss of fertile topsoil, degradation of forests, deterioration in aquatic biodiversity and public health. On the other hand, haphazard quarrying of sand from riverbeds may cause a rapid change in bed configuration in response to the changes in flow. Quarrying basically destroys landscape. This can lead to downstream movement, scouring, or accumulation of sediment while provoking shoreline erosion. When riverbeds are composed of sand, this on-going pattern of erosion and deposition causes meanders to progress slowly downstream in time .

Bridge Construction: Bridge construction operations sites include activities such as bridge demolition, structural excavation and backfill, erecting false work, forming and pouring concrete for footings columns and superstructures, boring, drilling, grinding, mortar mixing, blasting, and bridge cleaning is also main cause of river pollution

Sanitary survey conducted by KSPCB and Local body

Sanitation survey was earlier carried out by the Payyannur municipality. Based on the survey, following recommendations were made.

A. Short term recommendations to control pollution

1. PariyaramGramapanchayath

Providing household latrines

1.Provision of septic tank treatment system for houses(around 200 number houses).

2. New bio toilets for no latrine households and those which are directly connected to drains to water body (10 houses).

Community latrines

Community toilet will be provided wherever necessary with scientific septic tank system.

Solid waste management (Biodegradable waste)

For decomposition of biodegradable waste at its origin itself 815no's pipe compost has already issued and 10050 numbers is to be installed.Panchayath will provide Thumboormuzhi type treatment facility in two places.

Non-Biodegradable waste management

Material Collection Facility has already been started functioning for the management of non-biodegradable waste.For the last two years Haritha Karma Sena collecting non biodegradable wastes like plastics,bags,chappals,dress materials from each and every households, by levying Rs.40 per month and treat the same through MCF and RRF.Green Kerala Company is the agency for the bailed and shredded product from RRF.

Awareness programme

1. Awareness for residence association: Suchitwamission/LSGD/Corporation
2. SWM training to children, youth, Asha workers and other stake holders
3. Follow up systems: Capacity building of community groups, monitoring system and active involvement of residence association is necessary.

2.CheruthazhamGramapanchayath

Providing household latrines

Single pit conversion to bio toilet

Community latrines

- a.Maintenance of existing community toilet and construction of modern septic tank.
- b. Construction of new community toilet

Solid waste management (Biodegradable waste)

For decomposition of biodegradable waste at its origin itself pipe compost and biogas plants are being issued.

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3.MadayiGramapanchayath

Providing household latrines

Single pit conversion to bio toilet

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- b.Construction of new community toilet

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B. Long term Recommendations

Enforcement of rules for proper designing and construction of septic tanks has to be implemented. As the MCF and RRF are not fully activated in the local bodies such types of solid wastes are depositing on the river as well as on the Drains .So MCF and RRF shall be activated and all the waste generating within the local body must be collected and disposed through MCF and RRF.To prevent pollution of River through waste dumping, strict enforcement of rules is required.Fencing using G.I rod and chain shall be provided on bridges inorder to prevent the waste dumping from top of bridges.Local bodyhas to identify suitable location forlive.monitoring facilities. . The role resident's association is crucial in monitoring the pollution abatementenforcement of rules is required

Chapter 3

Sample Analysis and results

Restoration Plan: - Statutory Intervention

Water quality management through setting up of standards for discharge of municipal wastewater and industrial effluents are enforced through the consent to establish and consent to operate require a fresh look in view of ambient water quality requirements of aquatic resources. The prevailing standards prescribed in the consent to industrial sector and general discharge standards adopted for sewage treatment require change in approach from consumption to disposal to treat, recycle, reuse and discharge to aquatic system if matches with the norms of water quality of aquatic resources.

Polluted river stretches have been targeted for restoration of water quality through identification of sources of pollution and interventions through treatment for the municipal as well as industrial effluents.

Monitoring conducted by the Kerala State Pollution Control Board

The tributaries coming under Madayi GP are major causes to the polluted river identified through National Water Quality Monitoring Programme and the reconnaissance survey for river restoration. Most of the drains connecting to the Ramapuram River are completely dry since it is summer season. Only from drains with flow were able to check the flow rate and take the sample. Samples were collected from available drains and tested in the lab.

Test Results

Almost all parts of the river and drains were dry during inspection. So couldn't verify the pollution load.

Chapter 4

Action Plan

Action Plan of Local Body

Sl No	Local body	Ref para no:48 as per NGT order 673/2018 dated:20.09.2018	Activity	Implementing Agency	Unit	Fund and cost	Time of Completion
1	Pariyaram GP	A (b)	Sanitation Facility	Local body	Scientific Septic Tank and Soak pit (Around 20 Nos)	Total Sanitation Fund, Own Fund, Beneficiary Fund(30.00 Lakhs)	03/2020
		C (ii)	Bio degradable waste disposal		Ring compost, Pipe Compost, Dung Pits (10050 Nos) , ThumboorMozhi (2 Nos)	Total Sanitation Fund, Own Fund, Beneficiary Fund (30.00 Lakhs)	03/2022
		C (ii)	Non bio degradable Waste Disposal	Local Body	Clean Kerala Company, MCF	Levyng RS.40 per each	On going project

					and RRF	collection point	
		E	Awareness	youth, Asha workers and other stake holders	Gramasabha and Other classes	Total Sanitation Fund, Development fund, Own fund (1.25 Lakhs)	Whenever necessary
2	Mada yi GP	A (b)	Identification of illegal outlets in to drains and stoppage of the same	Local Body	Soak pit (10 Nos)	Total Sanitation Fund, Development fund, Own fund (1.25 Lakhs)	09/2019
		A (b)	Sanitation Facility	Local Body	Scientific Septic Tank and Soak pit for 22 Houses	Plan fund (SC) 4.4 lakhs	2022
		C (ii)	Bio degradable waste disposal	Ward Sanitation Committee of Local Body	Bio bins, Pit Compost (100 Nos)	Total Sanitation Fund, Own Fund, Beneficiary Contribution(10.00 Lakhs)	2022
		E	Awareness	youth, Asha workers and other stake holders	Mainly in Gramasabha	Beneficiary Contribution	On going

Action plan of Local body

1. **Public Toilet:** Construct public toilets using available funds on the bank of river near Tourist places, Fishing spots etc.
2. **Mini MCE:** Construct material collection facility in miniature form at suitable intervals on the bank of the river in order to prevent dumping of wastes in to water.
3. **Toilet at houses:** Construct toilets with scientific septic tank and Soak pit
4. **Ritro Fitting:** Maintenance work of existing toilets of residences near the bank of river using performance incentive grant.
5. **Bio degradable waste Disposal:** Distribution of Bio gas Plant, Composting facility to residences near river for bio degradable waste disposal.
6. **Common Waste disposal facility:** For the disposal of bio degradable waste disposal at market places, provide community level bio gas plants, Thumboormozhi etc. Using suitable funds
7. **Common Sewage treatment facility:** Provide common sewage treatment facility for waste water generating from market places and disposing in to public drains.
8. **Septage treatment facility :** Construct septage treatment facility

In addition to above, CCTV can be installed at suitable points in order to identify the persons/ establishments dumping waste in to river. All the local bodies must establish slaughter houses with modern facilities and unauthorized slaughter houses shall be strictly enforced.

Strict action shall be taken against non-violating person/ agency by the authorities when noticed. Plantation of trees and plants on the bank will be highly effective in controlling the waste disposal.

Action Plan by Irrigation Department

Sl no	Ref para no:48 as per NGT order 673/2018 dated:20.09.2018	Activity	Implementing Agency	unit	No of units	Cost in crores	Source of fund	Time for completion
1	C (ii)	Providing fencing on Ramapurambr idge across Ramapuramri ver at Madayi GP	Irrigation department	1	1	0.09	Plan Fund	2021
2	E	Desilting and repair of salt water exclusion cross bar at Ramapuram in cheruthazham GP	Irrigation Department	1	1	0.04	SDRF	2020
3	E	Regualting activites in flood plain zone, protection and management of flood plain zone	Irrigation Department	-	-	Protect ion and manag ement of flood plane zone for a period of 3	-	3 years

						years with a fund of 0.75 crores		
4	E	Greenery development-Plantation plan. Plantation on both sides of the river, setting up biodiversity parks on flood plains by removing encroachment	Irrigation Department	-	-	Planting trees on the bank of the river will be completed within 3 years from the commencement of works with a fund of 0.30 crores	-	2 years
5	E	Issues relating to E-flow, maintaining minimum environmental flow of river(by having watershed management provisions)	Irrigation Department	-	-	By Micro watershed management for a period of 3 years with a fund of 0.3 Crore	-	2 years

						from the availab le fund		
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Combined Action Plan

Sl no	Project		Proposed action	Agency	Remarks
	Pollution				
1	Sanitation	A (b)	Providetoilets to residences with treatment and disposal system for sewage and sullage	Local Body	As there are residences with single pit toilet
2	Community Toilet	A (b)	Construction of new community toilets with treatment system	All local bodies SuchitwaMission, Revenue department	Proposed Construction Of new community Toilet at satellite points on the bank of river
3	Rain water recharge	B (ii)	Entry of rain water and rain water recharging to all channels and drain	All local bodies , Kerala Water Authority,	Drains are inspected before rain and all channels and stream are cleaned once in a year
4	Solid waste management	C (ii)	Sanitary waste in hostels, establishments should be segregated, treated and disposed as per Solid Wastes Management Rules,2016 intheir respective wards.Aerocomposting and Material Collection Facility should be given in all wards near the river bank.	Pollution Control Board ,Health department	Check they have board consent and sanitation facility is provided
5	Household waste	C (ii)	Adequate number of kitchen bins shall beprovided	Municipalities and local bodies	Six months

6	Market	C (ii)	Providing proper waste handling facility. For wastewater and solid wastes		Six months
7	Rendering plant	C (ii)	Rendering plant for poultry wastes	Local body	Six months
8	Slaughter house	C (ii)	Slaughter house waste disposal facility	Local body	
9	Establishment like service station and workshops	A (iv)	Strict monitoring of disposal of waste(sewage, sullage, degradable waste, non-biodegradable waste) surveyed area and also in the catchment of the river i)Verify Whether consent to operate of the Board exists	Pollution Control Board	Six months
10	Sanitation survey should be done	A (b)	Sanitation survey is to be conducted for 100m on either sides of the other parts of polluted stretch if any located nearby	Pollution Control Board	Six months
11	Awareness	E	Awareness for residence association:	Suchitwamission/L SGD/Corporation	Once in a month

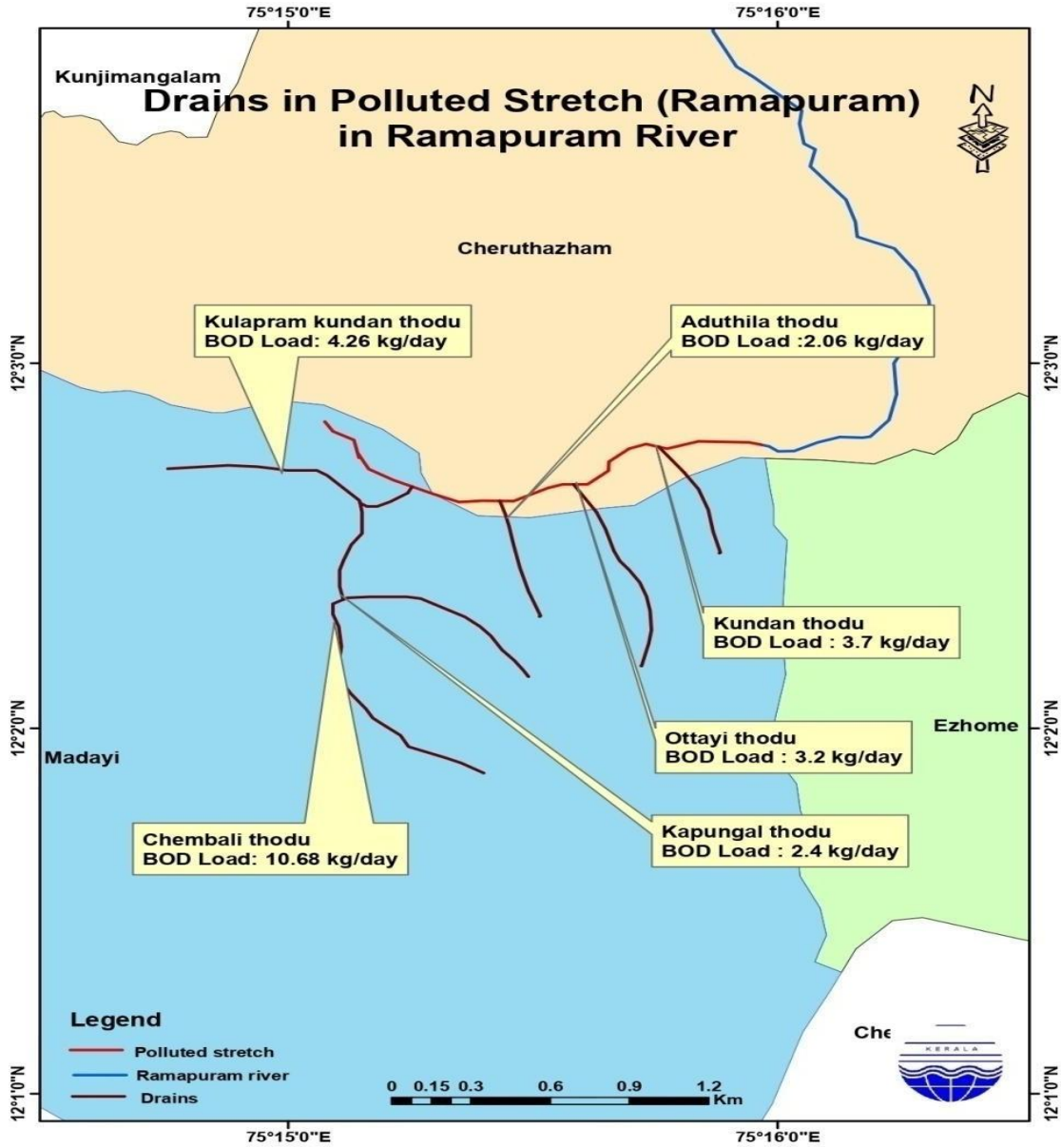
Action Plan by Ground Water Department

Sl.No	Ref para no:48 as per NGT order 673/2018 dated:20.09.2018	Activity	Ground Water Department
1	B(i)	Ground Water resources and regulation of ground water extraction by industries particularly in over exploited as critical zones/blocks	As per Groundwater resources of Kerala, 2017 estimate 1 block (Payyannur) comes under the Ramapuram river basin. It is a safe block with stage of groundwater extraction is 34.84%
2	B(ii)	Ground water recharging / rain water harvesting	The average premonsoon groundwater level ranges from 8.81 mbgl.
3	B(iii)	Periodic ground waste quality assessment and remedial actions in case of con taminated ground water tube wells/bore wells or hand pumps	Groundwater Department has 1 observation dug well and 1 bore well in the river stretch.
4	B(iv)	For regulating use of ground water for irrigation purpose, adopting good irrigation practices	Groundwater is not extracted for irrigation purpose in this area

Pollution Load

RAMAPURAM RIVER

SL NO	DRAINS	BOD	FLOW RATE	Pollution load BOD in Tpd
1	KAPUNGAL THODU	2.4	1	2.4
2	CHEMBALI KUNDU BRIDGE	2.67	4	10.68
3	KULAPRAM KUNDAN THODU	2.13	2	4.26
4	ADUTHILA THODU	2.06	1	2.06
5	OTTAYI THODU	3.2	1	3.2
6	KUNDAN THODU	1.86	2	3.72



Other than these following are some more suggestions from the part of pollution control Board.

1. Proper awareness among the inhabitants in the area is to be given for protecting the water bodies. Basic training for the people at the grass root level is to be provided for river management. All efforts for maintaining the quality of water bodies may be done by the Panchayat/Municipal authorities only with people's participation.
2. The nearby gramapanchayath and municipalities are mainly responsible for not providing municipal waste collection and treatment facilities in the locality. So they must be instructed to provide the required facility for scientific disposal of municipal solid waste as per the MSW rules 2016. The citizens as well as the municipal/gramapanchayath authorities need to be aware of the importance of scientific disposal of waste generated. Their attitude towards handling waste has to be changed. Reducing waste, recovering recyclable materials, return of nutrients to the eco system as well as generation of energy from waste are to be practised. There has to be a valid scheme for collection, segregation, transportation, processing and safe disposal of waste by the authorities. For this affordable and viable waste to energy conversion technologies apart from conventional composting is to be implemented by the municipalities seeking technical expertise.
3. Propagation of vegetative cover in water shed will reduce soil erosion and enhance percolation of rain water into the sub surface. In downstream stretches where the river is saline, propagation of mangroves are essential.
4. Strict monitoring from the part of implementing as well as monitoring agencies is required for effective functioning of waste treatment facilities in waste generating units.
5. The practice of waste dumping into the river is to be prevented legally and strict action against this practice is to be adopted at panchayath and municipality level.
6. Re-survey of the river boundaries throughout the entire stretch is to be done urgently so as to prevent encroachment of the river.
7. The municipalities as well as the panchayaths are to be directed to provide proper waste management facilities of their own. All towns and cities must have Sewage Treatment Plants (STPs) that clean up the sewage. Facility for collection, segregation, transport, processing and scientific disposal of waste generated are to be provided by the local authorities in strict adherence to the Municipal Solid Waste Management Rules, 2016. For this, affordable and viable waste to energy conservation technologies apart from conventional composting is to be implemented seeking technical expertise.

8. Strict monitoring from the part of implementing as well as monitoring agencies is required for effective functioning of waste treatment facilities in waste generating units. The riverine stretches are to be monitored periodically at identified locations for water quality assessment.
9. Modern agricultural practices and technologies introduce the use of inorganic fertilizers with Nitrogen, Phosphorous, Potash and inorganic pesticides in farm lands and play important role in the river pollution. These may concentrate into the water body through run off causing algal blooms by which whole stretch of water become choked. Fertilizers and chemicals application in agricultural lands are to be strictly under technical expertise.
10. Rain water recharging measures must be adopted.
11. Eco tourism and water tourism projects are to be designed giving due importance for protecting the environment. The activities are to be organized in such ways which do not induce any types of pollution to the water body. Strict monitoring from the concerned authorities are recommended in functioning of the tourism projects.
12. Implement Green Protocol effectively in local self governments. Prohibit littering of plastics in the area. Plastic wastes shall be handled as per the provisions of Plastic Waste (Management and Handling) Rules, 2018.
13. Actions shall be taken by the local bodies to clean the storm water drains. Rejuvenation of small streams, creeks leading into the river is to be done.
14. Round the clock patrolling shall be provided so as to prevent waste dumping on public places.