

ACTION PLAN FOR RESTORATION OF POLLUTED
LOCATION, PULIKKAKADAVU IN RIVER
CHALAKKUDY, THRISSUR – KERALA
(PRIORITY-V)

(OA No.673/2018)

Submitted

by

District Level Technical Committee
(Thrissur District)

Before

The River Rejuvenation Committee

B. B. L.
Chairman

District Level Technical Committee

Thrissur

Member
Member and Convenor

District Level Technical Committee

Thrissur

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EXECUTIVE SUMMARY

A District Level Technical Committee (Thrissur District) was constituted for preparing draft action plan for the rejuvenation of polluted river location , Pulikkakadavu in Chalakudy river. The members of the committee are as follows.

1. Superintending Engineer, Irrigation, Thrissur: Chairperson
2. Environmental Engineer, District Office, Kerala State Pollution Control Board:
Member & Convenor
3. General Manager, District Industries Centre: Member
4. Representative from revenue department nominated by the District Collector: Member
5. The District Co- ordinator, District Suchitwa Mission: Member
6. The Secretary, Annamanada Municipality: Member
7. The Secretary, Kadukutty Grama Panchayat
8. Joint Director, LSGD, Thrissur
9. Executive Engineer, Kerala Water Authority , Chalakudy Division, Thrissur

The Pulikkakadavu location of the Chalakudy River was identified as polluted location under Priority Category–5 in the CPCB 2022 assessment, leading to the constitution of a District Level Technical Committee (DLTC) to prepare a comprehensive River Rejuvenation Action Plan. Accordingly, DLTC meetings were conducted via online on 26.08.2025 and 24.09.2025 to assess the pollution status and to identify any localized, upstream, or downstream sources contributing to water quality deterioration.

During these meetings, all committee members contributed suggestions based on field evaluations and departmental assessments. A survey of District Industries Centre revealed that majority of the industries operating in the vicinity (i.e., in Annamanada Grama Panchayath) are small-scale units, with none falling under high-pollution categories. A large scale industry Nitta Gelatin Pvt. Ltd located in Kadukutty Grama Panchayat is operating on the upstream of Pulikkakadvu location. The industry fully complies with the Pollution Control Board (PCB) norms. Further, regular monthly monitoring by the Thrissur District PCB from 2022 to October 2025 consistently indicated low BOD levels, confirming that industrial discharges are not a significant source of pollution at this location. However, despite BOD levels being within permissible limits, Total Coliform concentrations are

observed to exceed prescribed standards, indicating potential contamination from non-industrial sources, such as domestic sewage or other diffuse, non-point sources.

The Irrigation Department proposed the removal of excessive vegetation growth along the riverbanks, as such overgrowth may restrict natural water flow, cause stagnation, and adversely impact water quality. To further identify possible pollution sources, a joint monitoring was conducted on 18.11.2025. No major pollution-contributing drains were identified in the immediate vicinity or upstream areas, except for one located at Kallur Vadakkummuri, approximately 1.5 km upstream of Pulikkakadavu Bridge. Laboratory analysis of samples from this drain indicated BOD levels within permissible limits, and no visible waste dumping or discharge was observed either at the drain or along the nearby river stretch, thereby ruling it out as a significant pollution source.

In conclusion, the findings of the joint inspection indicate that Pulikkakadavu does not require an extensive intervention plan, since essential pollution indicators like BOD remain within acceptable limits and no significant industrial or domestic pollution source has been identified. However, the elevated microbial load necessitates a vigilant, monitoring-centred strategy. The proposed action plan—encompassing enhanced surveillance, increased monitoring frequency, riverbank maintenance, community awareness, and strengthened inter-departmental coordination—provides a robust and comprehensive approach to protect and sustain the environmental quality of the Pulikkakadavu location along the Chalakudy River.

CHAPTER 1

INTRODUCTION

Under the National Water Monitoring Programme (NWMP), the Central Pollution Control Board (CPCB) monitors the country's aquatic resources through a network of about 3,500 stations across 29 States and 6 Union Territories. The network includes 2,541 surface-water stations and 989 groundwater wells. Water samples are analysed for 28 core physicochemical and bacteriological parameters, with selected samples further tested for 15 pesticides and 9 trace elements. Bio-monitoring is also conducted at designated locations to provide a comprehensive ecological assessment.

Analysis of recent monitoring data shows that organic pollution and microbial contamination remain major challenges in many water bodies. The primary cause is the discharge of untreated or partially treated domestic wastewater from urban centres, where sewage generation far exceeds treatment capacity. Low flows in several receiving water bodies reduce dilution, further intensifying pollution levels. As a result, biochemical oxygen demand (BOD) and bacterial contamination continue to increase, contributing to widespread waterborne diseases. Water quality assessments rely mainly on BOD as an indicator of organic pollution, and total and faecal coliform counts as indicators of pathogenic contamination.

As part of its routine river water quality assessment, the Central Pollution Control Board (CPCB) identifies polluted river stretches (PRS) based on Biochemical Oxygen Demand (BOD) levels. These stretches are classified into five priority categories:

- **Priority I:** BOD greater than 30 mg/L
- **Priority II:** BOD between 20–30 mg/L
- **Priority III:** BOD between 10–20 mg/L
- **Priority IV:** BOD between 6–10 mg/L
- **Priority V:** BOD between 3–6 mg/L

Using Biochemical Oxygen Demand (BOD) as the key criterion, CPCB's latest assessment—based on 2019 and 2021 data—shows significant improvement compared to earlier years. While earlier assessments identified 150 polluted river stretches (PRS) in 2009,

302 in 2014, and 351 in 2018, the number has reduced to 311 in 2022. The proportion of polluted rivers has also declined from 70% in 2009 to 46% in 2022, with 57% of monitored locations now meeting the BOD standard of <3 mg/L for outdoor bathing. Improvements were recorded in 180 stretches, including the complete removal of 106 stretches from the polluted list, and 74 stretches were reclassified to lower priority categories. However, 108 stretches showed no improvement. In the 2018 assessment, 31 States/UTs had polluted rivers, with Maharashtra having the highest number (53), followed by Assam (44), Madhya Pradesh (22), Gujarat (20), Odisha (19), and Karnataka and West Bengal (17).

In Kerala, river water quality monitoring conducted at 75 locations across 49 rivers during 2019 and 2021 revealed that 25 locations on 18 rivers did not comply with the prescribed BOD standards. According to the CPCB report “Polluted River Stretches for Restoration of Water Quality, 2022,” the Pulickalkadavu monitoring point on the Chalakudy River in Thrissur district has been identified as one of the polluted location. This location falls under Priority Class V, with BOD values ranging between 3 and 6 mg/L, indicating moderate levels of organic pollution.

OA 673/2018 – Directions of the Hon’ble National Green Tribunal (NGT)

In O.A. No. 673/2018—initiated on the basis of a news report in *The Hindu* by Shri Jacob Koshy titled “*More river stretches are now critically polluted in India: CPCB*”—the Hon’ble National Green Tribunal (NGT) issued a series of directives on 20.09.2018, 19.12.2018, 08.04.2019, and 06.12.2019. The Tribunal instructed all States and Union Territories to formulate and submit comprehensive action plans within two months, ensuring that all polluted river stretches are restored to at least bathing-quality standards within six months of the plan’s approval. Bathing-quality water is defined as Biochemical Oxygen Demand (BOD) < 3 mg/L and Faecal Coliform < 500 MPN/100 ml. Additionally, river water is considered suitable for bathing when Chemical Oxygen Demand (COD) is < 30 mg/L, Dissolved Oxygen (DO) > 5 mg/L, and Faecal Coliform < 500 MPN/100 ml.

Despite these repeated judicial directions, substantial quantities of untreated sewage and industrial effluents continue to be discharged into rivers and other water bodies across the country. A key underlying factor is the persistent shortfall in sewage treatment capacity, which remains grossly inadequate relative to the total volume of sewage generated

CHALAKUDY RIVER

Chalaky Puzha, the fifth-longest river in Kerala, extends for about 145 km and drains a basin area of 1,404 km² within the state. Originating from the Anamalai and Nelliampathy ranges of the Western Ghats, the river flows westward through the districts of Palakkad, Thrissur, and Ernakulam. Its major tributaries include Paambikulam, Kuriarkutty, Sholayar, Karappara, and Anakayam. The river's largest stretch lies within Thrissur district, after which it joins the Periyar River near Paravur, ultimately draining into the Lakshadweep Sea.

The basin is bounded by the Karuvannur sub-basin to the north and the Periyar sub-basin to the south, and contains approximately 30,000 ha of wetlands. It receives an average annual rainfall of about 3,000 mm. The total drainage area of the Chalakudy River is 1,704 km², of which 1,404 km² lie in Kerala and the remaining 300 km² in Tamil Nadu. The river is home to the renowned Athirappilly and Vazhachal waterfalls. Major hydropower installations on the river include the Sholayar and Peringalkuthu Hydro-Electric Projects, while the Thumboormoozhy Weir supports irrigation activities. The river merges with the Periyar near Elenthikkara, close to North Paravur in Ernakulam district, before entering the Kodungallur backwaters and finally the Arabian Sea at Azhikode–Munambam (Central Water Commission, 2018).

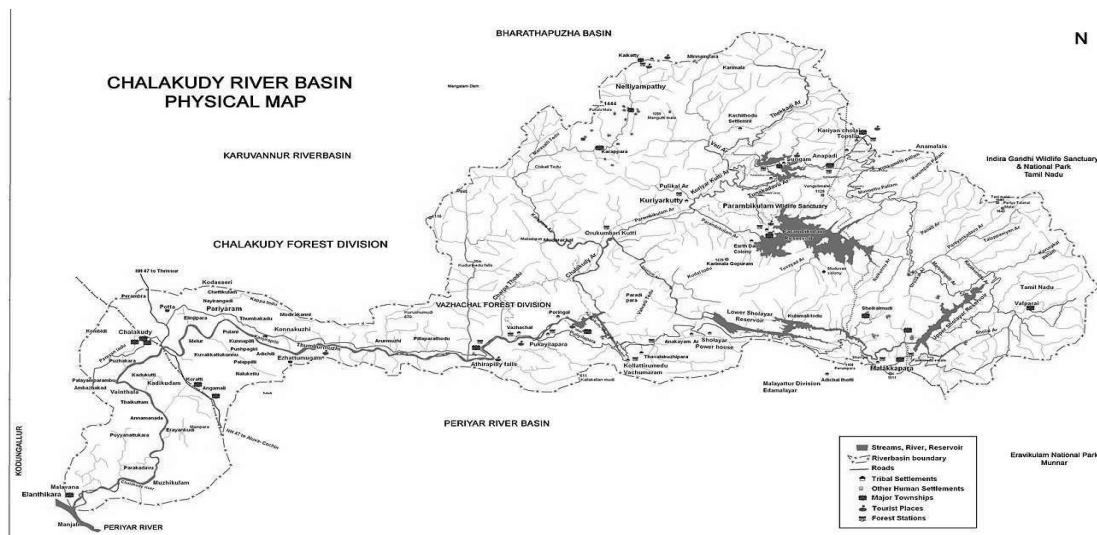


Fig. 1. Chalakudy River Basin

Monitoring Locations at Chalakudy River

As part of the National Water Quality Monitoring Programme (NWMP) administered by the Central Pollution Control Board (CPCB), a designated monitoring station is established at Pulickakadavu (Station Code: 1154). Additionally, under the State Water Quality Monitoring Programme (SWMP), routine surface water quality monitoring is conducted at Peringal Bridge (Station Code: K49), Vettilappara (Station Code: K50), Kanjirapilly (Station Code: K51), Chalakudy Bridge (Station Code: K52), and Palapuzhakadavu (Station Code: K54) to assess the spatial and temporal variations in water quality along the river stretch.

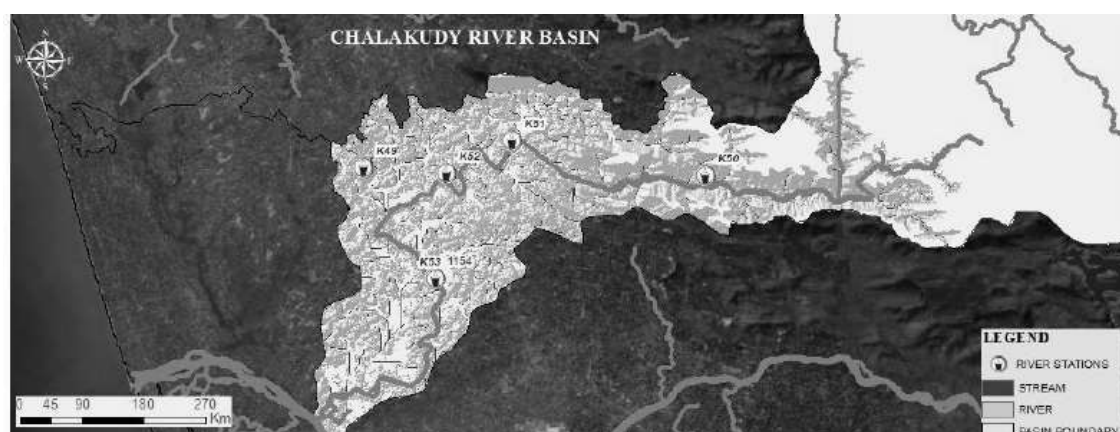


Fig 2. Monitoring locations at Chalakudy river

Pulikkakadavu at Chalakudy River

The Pulikkakadavu Bridge (Palam) spans the Chalakudy River, forming a vital link between Annamanada village on one bank and the Kallur, Valoor, and Koratty regions near NH544 on the opposite side. Annamanada Grama Panchayat, which includes localities like Pulikkakadavu, relies on this bridge for daily transportation and connectivity with neighboring areas. Although the bridge connects two different administrative jurisdictions—Annamanada Panchayat on one side and Kadukutty Panchayat on the other, where Kallur Vadakkummuri and the Kadukutty Grama Panchayat office are situated—Pulikkakadavu itself remains part of Annamanada Panchayat. Kallur

Vadakkummuri accesses NH544 through both the Annamanada–Pulikkakadavu Bridge and the Palayam Parambu Bridge, making these crossings essential for local commuters, trade, and transport. In addition, the Chalakudy River upstream from the bridge hosts industrial activity, such as the Nitta Gelatin plant at Kathikkudam.

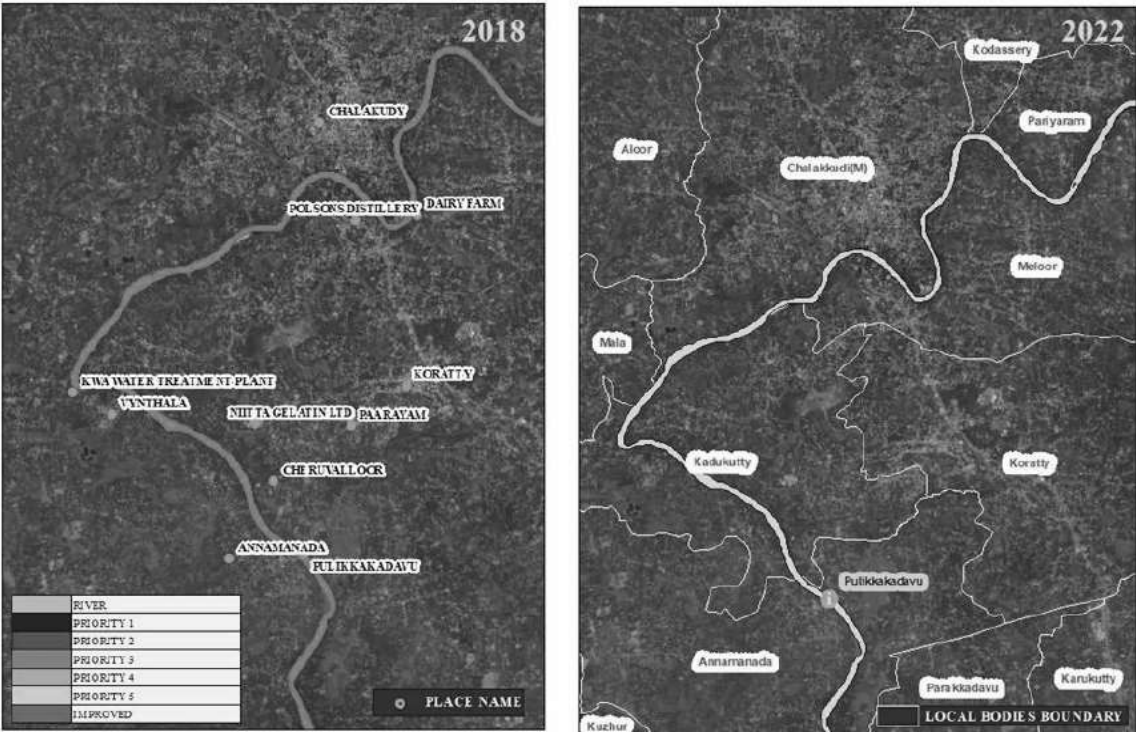


Fig 3. Newly identified polluted location at Pulikkakadavu – River chalakudy (Priority V)

CHAPTER 2

ASSESSMENT OF RIVER WATER QUALITY AT PULIKKAKADAVU BRIDGE

Water quality monitoring data from the past four years at Pulikkakadavu Bridge were analysed, with sampling and laboratory testing performed following the standardized procedures and quality assurance protocols established by the CPCB. The comprehensive results are summarized in the table below. (Table: 1, 2, 3 & 4)

Analysis Report of Pulikkakadavu in the Year 2022 (Table 1)

Sampling month	Dissolved Oxygen (mg/l)	pH	BOD (mg/l)	Total Coliform (CFU/100ml)	Faecal Coliform (CFU/100ml)
January	8.4	7.1	1.9	Not conducted	Not conducted
February	8.4	7.4	1.9	Not conducted	Not conducted
March	6.0	8.0	1.0	Not conducted	Not conducted
April	7.92	8.18	1.54	800	300
May	6.89	6.89	1.19	300	100
June	7.67	7.02	2.5	400	200
July	7.94	6.64	2.8	450	200
August	7.68	7.57	1.73	700	400
September	7.68	6.81	1.28	700	400
October	5.24	6.91	1.87	200	50
November	6.85	6.91	1.55	600	400
December	6.82	8.06	0.81	300	200

Analysis Report of Pulikkakadavu in the Year 2023 (Table 2)

Sampling month	Dissolved Oxygen (mg/l)	pH	BOD (mg/l)	Total Coliform (CFU/100ml)	Faecal Coliform (CFU/100ml)
January	7.12	7.21	1.94	400	200
February	7.01	6.91	2.98	100	50
March	5.39	7.68	1.60	500	450
April	4.23	7.09	0.32	200	NIL
May	6.02	7.96	2.54	800	400
June	5.81	8.20	1.06	300	100
July	6.23	6.44	1.89	300	150
August	5.70	6.93	2.50	600	150
September	5.93	7.01	1.15	200	NIL
October	7.20	6.60	2.10	300	NIL
November	4.66	7.63	2.70	300	100
December	5.50	7.88	2.54	400	50

Analysis Report of Pulikkakadavu in the Year 2024 (Table 3)

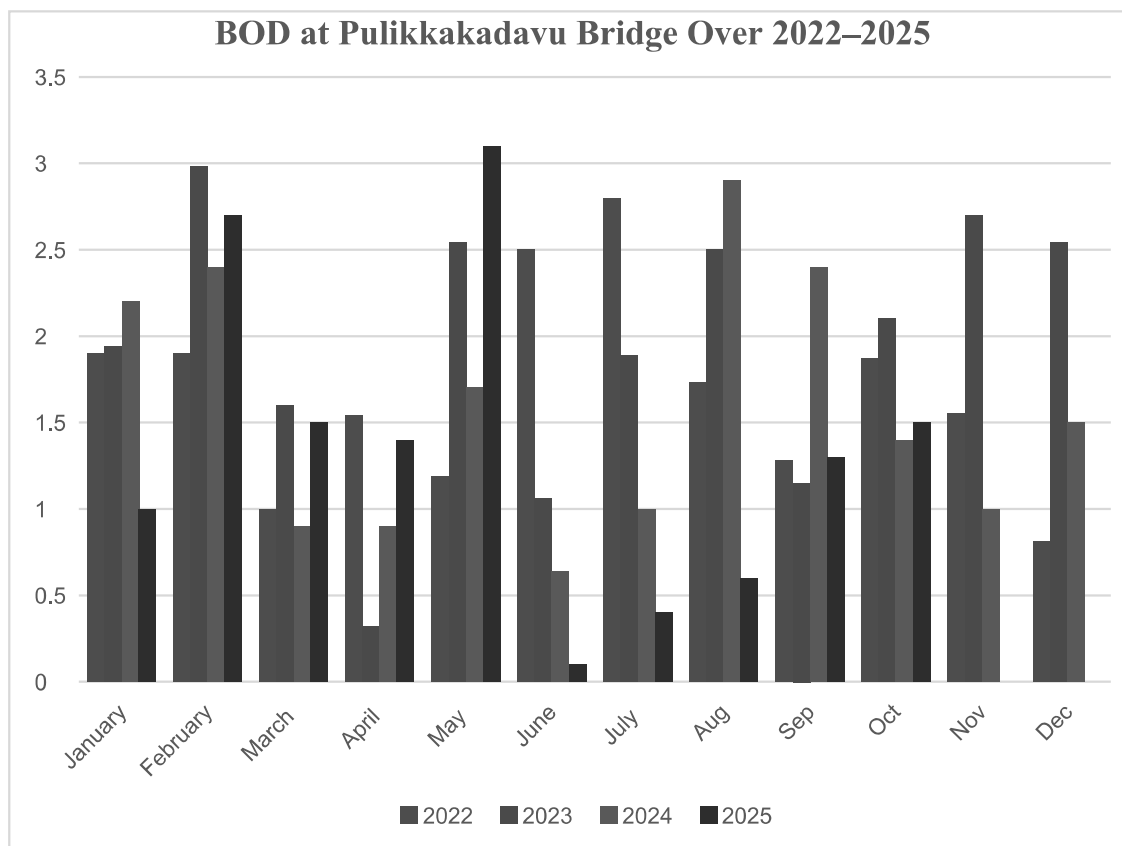
Sampling month	Dissolved Oxygen (mg/l)	pH	BOD (mg/l)	Total Coliform (CFU/100ml)	Faecal Coliform (CFU/100ml)
January	3.81	7.05	2.2	400	Nil
February	6.7	8.0	2.4	700	200
March	7.6	7.17	0.9	550	Nil
April	5.3	7.5	0.9	Nil	Nil
May	5.4	6.6	1.7	2500	1700
June	5.2	8.0	0.64	2400	1500
July	6.7	7.0	1.0	3800	1700
August	8.9	6.9	2.9	1600	280
September	7.4	7.0	2.4	1300	790
October	6.8	7.3	1.4	2200	1400

November	7.2	7.0	1.0	260	170
December	6.8	7.4	1.5	7000	3800

Analysis Report of Pulikkakadavu in the Year 2025 (Table 4)

Sampling month	Dissolved Oxygen (mg/l)	pH	BOD (mg/l)	Total Coliform (CFU/100ml)	Faecal Coliform (CFU/100ml)
January	8.2	7.3	1.0	8	2
February	7.7	8.9	2.7	3100	700
March	7.6	7.5	1.5	3800	2000
April	7.4	7.4	1.4	2800	1500
May	6.2	7.1	3.1	790	330
June	6.6	9.0	0.1	3900	2400
July	6.6	6.8	0.4	5400	790
August	8.6	7.3	0.6	1200	260
September	7.9	6.9	1.3	3500	310
October	7.3	7.7	1.5	49	6

BOD(mg/l)



Monthly monitoring by KSPCB from 2022 to October 2025 indicates that BOD levels have generally been within the prescribed limit of 3 mg/L. The only exception occurred in May 2025, when a BOD concentration of 3.1 mg/L was recorded, slightly exceeding the standard. This appears to be an isolated incident, with subsequent monitoring confirming compliance with the regulatory limit.

While BOD levels at Pulikkakadavu remain within permissible limits, the Total Coliform count at this location consistently exceeds the standard. In contrast, upstream and downstream monitoring stations under the SWMP program do not show comparable increases, indicating a localized contamination issue.

Pollution load in drains

A joint inspection was carried out at Pulikkakadavu Bridge (Lat: 10.2404° Long: 76.331784°) on 18 November 2025 with the specific objective of identifying potential sources of pollution, particularly those contributing to elevated total coliform concentrations. The inspection revealed that no major drains or outfalls discharging pollutants into the water body

are present in the immediate vicinity of the bridge. Moreover, no visible effluent discharges, sewage inflows, or solid waste dumping activities were observed during the site visit.

An upstream inspection covering a distance of approximately 1.5 km identified the Kallur Vadakkummuri drain (Lat: 10.264272° Long: 76.299406°) as a possible source. However, field observations indicated the absence of any visible waste disposal or sewage discharge to the drain. Subsequent laboratory analysis (Table.5) of samples collected from the drain further confirmed that it does not make a significant contribution to the overall pollution load, including Total Coliform contamination, at the Pulikkakadavu monitoring point.

Pollution load at Kallur Vadakkummuri Drain (Table.5)

Parameter	Value
Biochemical Oxygen Demand	1.2 mg/l
Total Coliforms	30 CFU/100ml



Joint inspection conducted at Pulikkakadavu bridge on 18.11.2025



Drain located at Kallur Vadakkummuri during joint monitoring

ACTION PLAN

Activity	Implementing Agency	Cost (Rs. Lakh)	Source of Fund	Timeline	Expected Outcome
Strengthening night-time surveillance along the Pulikkakadavu bridge and riverbank	Annamanada Gramapanchayat h & Police Department	---	LSGD funds	----	Prevention of illegal waste dumping and identification of intermittent pollution sources
Installation of CCTV cameras	Annamanada Gramapanchayat	----	Panchayath Own Fund /	31.03.2026	Improved real-time

at strategic points (bridge area, riverbank access points, under-bridge area)	h		State Plan		monitoring, evidence collection, deterrence of unauthorized activities
Periodical inspection of Vadakkummuri drain to prevent unauthorized sewage connections	LSGD (Annamanada GP) & Health Department	-----	LSGD sanitation fund	Monthly	Prevention of domestic sewage mixing into the river; reduction in microbial load
Periodic removal of overgrown vegetation along the riverbank	Irrigation Department	4,30000	Irrigation Department maintenance fund	Annually	Better water flow, reduced stagnation, improved visibility for surveillance
Installation of warning signboards prohibiting waste dumping	Annamada Gramapanchayat h	----	----	30.01.2026	Visible deterrence; reduced human activities contributing to coliform increase
Increasing number of sampling points (upstream,	Kerala State Pollution Control Board	---	PCB internal fund	Monthly	Better identification of contaminatio

downstream, drain area) and enhancing microbial monitoring					n source; improved water quality assessment
River water quality monitoring at Pulikkakadavu Bridge	Kerala State Pollution Control Board	---	National Water Quality Monitoring Programme (NWMP), CPCB fund	Ongoing; monthly frequency	Monitoring of water quality
Inspection & effluent quality monitoring of the Nitta gelatin and other major pollution prone Establishments	Kerala State Pollution Control Board	--	----	Ongoing; monthly frequency	Prevents unauthorized discharges; improves compliance with discharge norms