

CHAPTER - IV

Municipal Sewage treatment for restoration of Polluted River Stretches and Lakes

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4.1 Introduction

According to the Seventh Schedule of the Constitution of India (Article 246), 'Water' is a State Subject, and it is the responsibility of the States/UTs to ensure cleanliness and development of rivers within their jurisdiction. The Union Government supplements efforts of the States/UTs by providing financial and technical assistance for abatement of pollution in identified stretches of rivers in the country.

CPCB in association with SPCBs/Pollution Control Committees (PCCs) in different States/ UTs has been monitoring the water quality of rivers and other water bodies across the country, through a network of monitoring stations under the National Water Quality Monitoring Programme (NWQMP). Based on water quality monitoring results, CPCB in September 2018 had identified 351 polluted stretches on 323 rivers across the country which included 17 rivers from West Bengal. The polluted locations in a continuous sequence are defined as Polluted River Stretches (PRS) and categorised in five priority classes based on BOD concentration as follows:

- (i) exceeding BOD levels >30 mg/l,
- (ii) BOD between 20 mg/l & 30 mg/l,
- (iii) BOD between 10 mg/l & 20 mg/l,
- (iv) BOD between 6 mg/l & 10 mg/l and
- (v) BOD between 3 mg/l & 6 mg/l.

NGT³⁸ in the case of Restoration of Polluted River stretches asked (December 2019) all the States and Union Territories to revise, prepare and implement action plans to restore polluted PRSs. The order directed 100 *per cent* treatment of sewage by 31 March 2020 to the extent of in-situ remediation. The timeline for completing all steps of the action plans including completion of setting up of STPs and their commissioning was March 2021.

Audit observed that due to non-processing of solid and liquid waste within the time line, the Principal Bench of the Hon'ble NGT in its order dated 01 September 2022, had directed the State Government to deposit ₹ 3,500 crore as compensation within two months.

Accordingly, the State Government deposited ₹ 3,500 crore in a ring fenced account and a sum of ₹137.10 crore has been incurred from the account till November 2023. Fund from this ring fenced account will be utilized for future purposes as and when required.

Of the 17 PRS identified (2018) by CPCB in West Bengal, seven river stretches were examined in the course of Audit. CPCB's Report on "PRS for Restoration

³⁸ Order against the OA No. 673/2018.

of Water Quality-2022” was also examined by Audit wherein it was noted that the water quality, based on the BOD level, of these seven sampled PRS changed over the period from 2018 to 2022 leading to a change in their status, as shown in **Table 4.1**.

Table 4.1: Status of sampled PRS

Sl No.	Name of River	Status in 2018	Status in 2022	Remarks on quality of water
1	Mahananda	Priority-II	Priority-I	Deteriorated
2	Churni	Priority-III	Priority-II	Deteriorated
3	Mathabanga	Priority-IV	Priority-III	Deteriorated
4	Ganga	Priority-III	Priority-IV	Improved
5	Dwarka	Priority-III	Priority-V	Improved
6	Vidyadhari	Priority-I	Priority-II	Improved
7	Mayurakshi	Priority-V	Excluded from PRS	Improved

Audit observed that although the water quality of three rivers *Dwarka*, *Vidhyadhari* and *Ganga* improved in terms of BOD, the bacteriological contamination in terms of the level of Faecal Coliform (FC) was still at an alarming level as discussed in paragraphs 3.3.2, 3.7.1 and 3.4.4. Further, in contravention of the Guidelines of Water Quality monitoring issued (December 2007) by CPCB which requires that sampling stations should be located upstream and downstream of significant pollution outfalls like city, sewage drains and industrial effluent outfalls, the river *Mayurakshi* was excluded from the polluted river stretch list by CPCB on the basis of the water quality report of WBPCB for only the upstream water as discussed in detail in **Paragraph 4.6.2**.

This Chapter deals with the management of municipal sewage for abatement of pollution of the seven selected PRS and two lakes namely *Santragachi* and *Mirik* lakes.

Audit findings are discussed in the succeeding paragraphs.

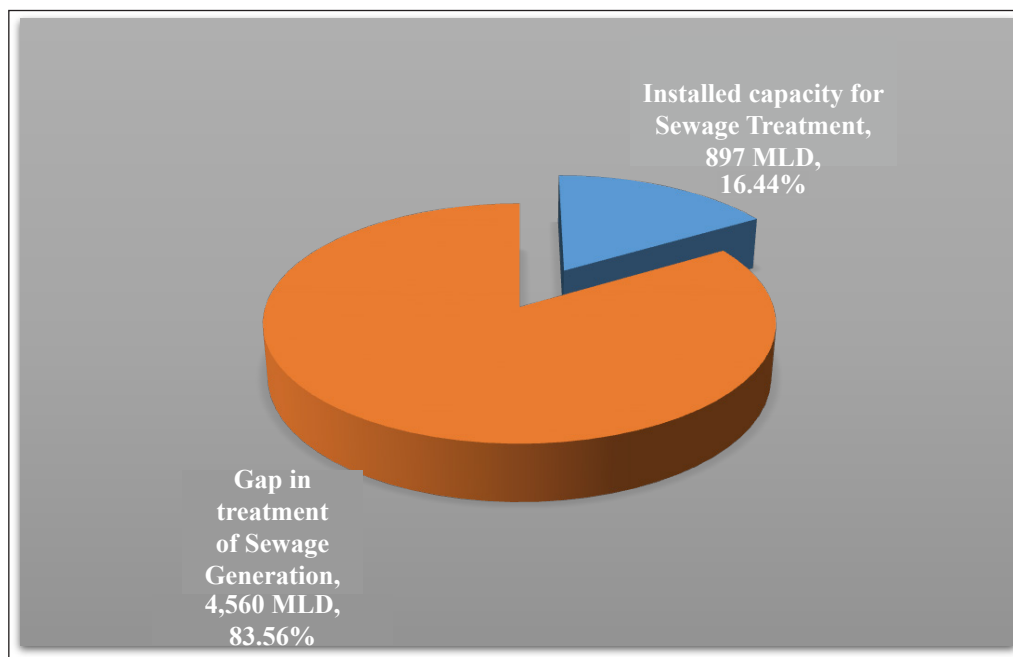
4.2 Gap in sewage treatment

STPs play a crucial role in managing wastewater. The main functions of STPs include (a) pollution reduction by removing harmful contaminants, (b) environmental protection by ensuring that discharge water meets environmental standards, (c) water recycling by reusing treated wastewater and (d) public health protection by preventing spread of diseases associated with untreated sewage.

NGT set a deadline of March 2021 to take all steps for rejuvenation of polluted river stretches including completion of setting up of STPs and their commissioning.

As of March 2021, the estimated sewage generation for the State was 5,457 MLD and the total capacity for sewage treatment of the 29 existing and 36 proposed STPs was 1,202 MLD. However, installed capacity of STPs was only 897 MLD (16.44 per cent) causing a gap of 4,560 MLD as shown in **Chart 4.1**.

Chart 4.1 : Total Sewage Generation vs Sewage Treatment



Further, out of 897 MLD of installed capacity, the operationalized capacity was 337 MLD (37.56 *per cent*) and the actual utilized capacity was only 213 MLD (63.20 *per cent*). Further the aggregate capacity of environmentally compliant STPs (i.e. STPs meeting discharge standards of MoEF&CC and NGT norms³⁹) was only 126 MLD.

In addition to the above sewage generation, there were 123 dumpsites in the State with legacy solid waste of 61.76 MT (August 2023) which also contributed to the water pollution.

Further, out of 7,322 villages in the four sampled districts of the State, only 197 villages were declared as Open Defecation Free plus (ODF+) till December 2023. The unsafe faecal disposal practice contributed to the conversion of large areas of land into faecal fields which potentially put water sources at risk of flooding with faecal material during rains.

Thus, there was a huge gap between sewage generation and the capacity available for its treatment, leading to deterioration of water quality of rivers. Considering rapid urbanisation and resultant rise in sewage generation, there is a need to bridge the existing gap on priority. Apart from filling up this gap, there is also a need to synchronise future requirement of sewage treatment capacity.

The detailed reasons for gaps in sewage treatment capacity are discussed in the succeeding paragraphs. Audit observations on municipal sewage treatment in respect of seven sampled rivers are in succeeding paragraph:

³⁹ As per MoEF&CC norms vide their order dated 13 October 2017 (i) For cities other than metro cities, state capitals and Union Territories - pH-6.5 to 9.0, BOD < 30mg/l, TSS < 100 mg/l and FC < 1,000 MPN/100 ml and as per the norms of NGT vide order dated 30 April 2019 revised the norms as BOD < 10 mg/l, pH – 5.5 to 9.0, TSS < 20 mg/l, COD < 50 mg/l; FC – desirable <100 MPN/100 ml & permissible < 230 MPN/100 ml, Nitrogen-Total < 10 mg/l and Phosphorous-Total < 1.0 mg/l.

4.3 Pollution Abatement for River Ganga

National Ganga River Basin Authority (NGRBA) was established (February 2009) with the objective of ensuring that by the year 2020 no untreated municipal or industrial effluents are discharged into the River Ganga. *Namami Gange* was approved by Government of India in 2015 to accomplish the twin objectives of effective abatement of pollution and conservation-rejuvenation of river Ganga. The Action Plan for Rejuvenation of River Ganga identified (July 2020) a total 120 kms stretch from *Tribeni* to *Diamond Harbour* encompassing 29 Towns⁴⁰ of West Bengal located on the banks of the Ganga, as polluted.

Audit observed that 17 projects (new/renovation) involving setting up of 26 STPs with an aggregate capacity of 491.68 MLD and an aggregate approved cost of ₹ 2,862.95 crore were taken up (between February 2011 and September 2020) for treating municipal sewage falling into the river Ganga. An expenditure of ₹ 1,707.39 crore was incurred on setting up of STPs along with Intersection and Diversion structures (as of June 2023). Of the 26 STPs, 19 STPs with a total capacity of 231.68 MLD were completed and operationalized by KMDA.

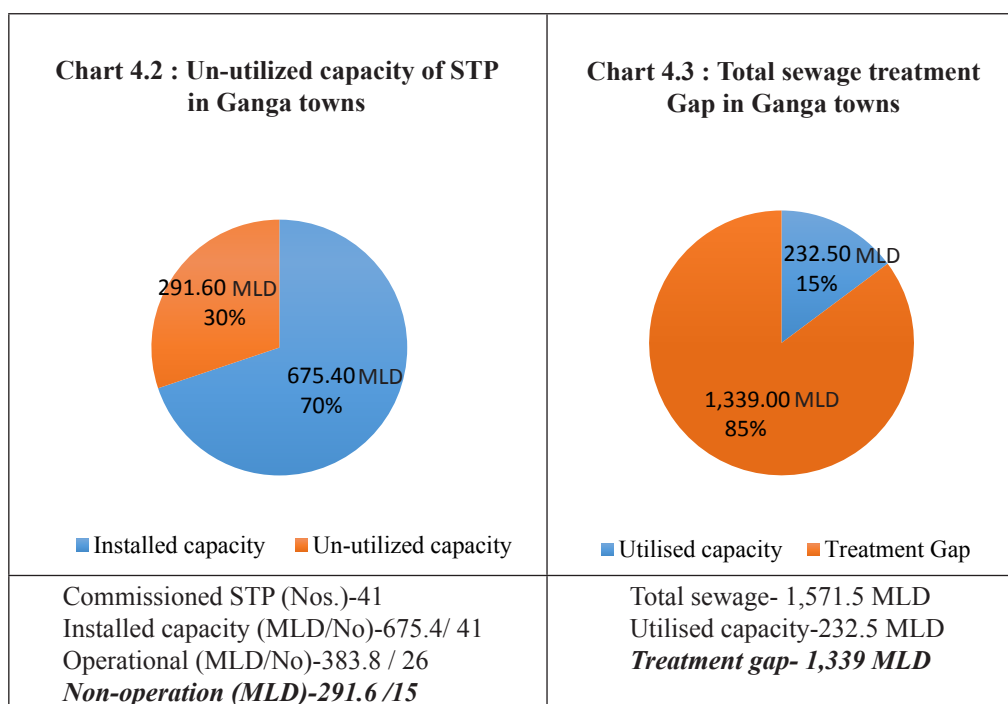
However, Audit observed that the sewage treatment capacities were impaired in the absence of adequate sewerage conveyance systems connecting to the household sewer line, non-installation of disinfection system, deficient co-ordination amongst different agencies, deficient functioning of established infrastructure, etc., as discussed below:

4.3.1 Non-achievement of targets for sewage treatment

The aim of the *Namami Gange* programme⁴¹ was to target sanitation of all anthropogenic activities, waste management of all industrial units, reduce water pollution levels etc. Sewage Treatment Plants play an important role in meeting the objectives of the Programme and controlling water pollution. The status of 41 STPs commissioned in 29 towns on the bank of river Ganga in the State as of March 2023, is detailed in **Chart 4.2** and **Chart 4.3**.

⁴⁰ Baidyabati, Bansberia, Baranagar, Barrackpore, Bhadreswar, Bhatpara, Budge Budge, Champdani, Chandannagar, Diamond Harbour, Garulia, Gayeshpur, Halisahar, Howrah, Hooghly-Chinsura, Kalyani, Kamarhati, Kanchrapara, Khardaha, Kolkata MC, Konnagar, Maheshtala, Naihati, North Barrackpore, Panihati, Rishra, Serampore, Titagarh and Uttarpara-Kotrung.

⁴¹ The Cabinet Approval to *Namami Gange* was given on 13 May 2015. The programme was to be implemented by 2020.



- Out of 41 commissioned STPs, 26 STPs were in operation with an installed capacity of 383.80 MLD. Audit observed that only 232.50 MLD was being utilized *i.e.* 60.60 *per cent* of 383.80 MLD. The underutilization of the installed capacity was mainly due to pending work of diversion of sewerage to the STPs by providing house connections and installation of Interception and Diversion (I&D) network for the drains.
- The reasons for non-operation of 15 STPs were mainly due to damaged infrastructure and wastewater load not reaching the STPs.

Thus, there was a gap of 1,339 MLD⁴² in treatment capacity and almost 85 *per cent* of total sewage generated was released into the river Ganga without treatment.

4.3.2 Compliance status of the STPs

MoEF&CC vide their order dated 13 October 2017, stipulated the standard⁴³ to be followed for treated sewage from STPs. Further, NGT *vide* order dated 30 April 2019 revised this standard⁴⁴, which *inter alia* stipulated that BOD is required to be <10 mg/l.

The Monitoring report of CPCB (for March 2023), revealed that out of total 26 operational STPs installed on the river Ganga in the State, only 13 were found to be compliant in terms of BOD and only seven STPs were compliant in terms of FC⁴⁵ criteria of the NGT norms.

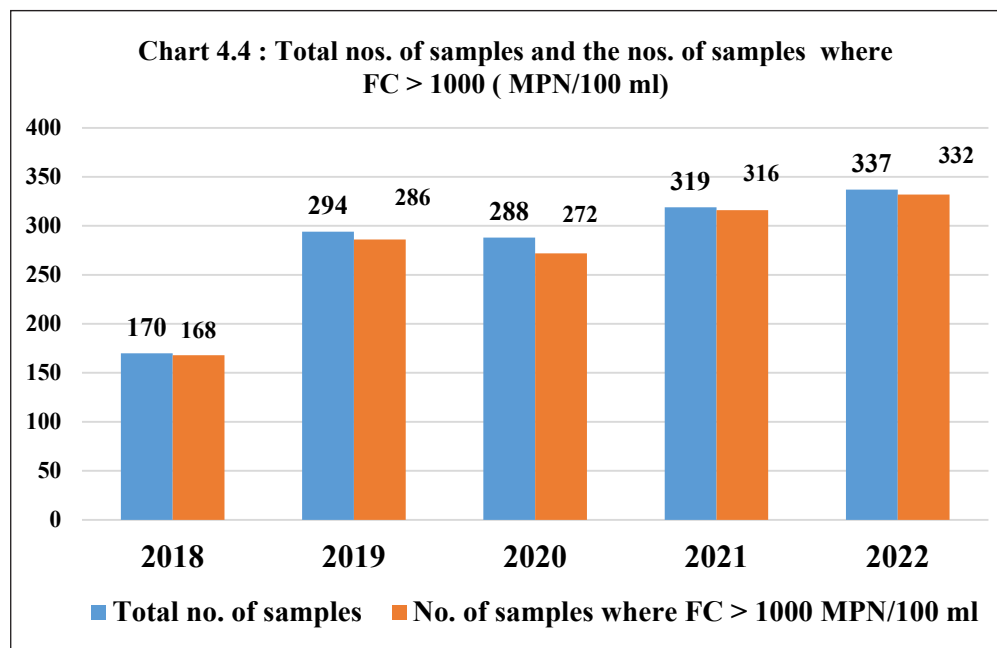
⁴² Total sewage (1,571.50 MLD) – Utilised capacity (232.50 MLD) = 1,339.00 MLD.

⁴³ (i) For cities other than metro cities, state capitals and Union Territories - pH-6.5 to 9.0, BOD <30 mg/l, TSS < 100 mg/l and FC < 1,000 MPN/100ml.

⁴⁴ pH – 5.5 to 9.0, TSS < 20 mg/l, COD < 50 mg/l; FC – desirable < 100 MPN/100 ml & permissible < 230 MPN/100 ml, Nitrogen-Total < 10 mg/l and Phosphorous-Total < 1.0 mg/l.

⁴⁵ FC > 1,000 MPN/100 ml.

Further, it was noted that the entire length of the river Ganga was polluted by Faecal Coliform bacteria, in variable degrees as was evident from the water quality data during the period 2018-22 of all the 14 monitoring stations of WBPCB as shown in **Chart 4.4**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

Audit observed that despite high bacteriological contamination which might lead to waterborne diseases, adequate steps were not being taken by the implementing agencies as mentioned in the Action Plan (like *Kolkata Municipal Corporation, Kolkata Metropolitan Development Authority etc.*), for rejuvenation of river Ganga as was evident from the STP monitoring report of CPCB (March 2023). It was also observed that disinfection system *i.e.* chlorination plants for mitigating bacteriological contamination were not available in 12 out of total 26 operational STPs.

Audit findings in sampled STPs of towns located on the river Ganga, are discussed in succeeding paragraphs:

4.3.2.1 Gayeshpur STP

The work of setting up of *Gayeshpur* STP with 8.33 MLD installed capacity was administratively approved (February 2011) by the National River Conservation Authority at an estimated cost of ₹168.67 crore for completion by February 2014. It was seen that KMDA took more than two years to finalise the tender and finally the work was awarded at a cost of ₹ 156.93 crore in October 2013. The STP started operations from September 2017.

Audit observed that since operationalization of the STP, it did not run at full capacity. As per the report⁴⁶ of March 2023, only 2.95 MLD of capacity was being utilised against an installed capacity of 8.33 MLD. It was also noted that out of 15,000 households in the catchment area, 11,575 house

⁴⁶ Monthly Progress Report sent by the WBSPMG (West Bengal State NGRBA Programme Management Group) to the NGRBA in the NGT matter OA No 673.

connections only (i.e. house sewer connected to drains) were completed till November 2023. Further, four drains were also yet to be tapped (i.e. intercepted and diverted to STP for treatment).

In reply the Department stated (March 2024) that for feeding full capacity sewage, work of Interception and Diversion of six untapped drains carrying sewage was under process.

4.3.2.2 *Panihati* STP

The work of rejuvenation of existing three STPs⁴⁷ along with lifting station & pumping station, sewage network and five years operation and maintenance was awarded in December 2019 at a tendered cost of ₹ 52.99 crore. These STPs were to cater to three municipal towns along the river Ganga viz. *Panihati*, *Garulia* and *Naihati* and were to be rejuvenated within one year of award of the contract. Audit observed the following lapses in implementation of the project:

- Joint site inspection of *Panihati* (August 2023) by Audit along with the officers of KMDA, revealed that operation and maintenance had started from July 2022, without getting CTO⁴⁸ from WBPCB and without completion of all the components viz. connection from the Lifting Station (LS) to the Main Pumping Station (MPS) intersecting the main outfall drain (PB Ghat drain) of the *Panihati* Municipality into Ganga.
- The sewer connection to the existing work and intersection with the drain could not be done as requisite approval was not received from the concerned Department⁴⁹. The letter regarding existing sewage line was addressed to the concerned Executive Engineer only in June 2022, more than two years after taking up the work in January 2020. This indicated poor planning and lack of effective co-ordination between the departments.
- Instead, a portion of the nearby drain was being diverted to the pumping station for feeding the STP. The effluents from the STP were falling into nearby ditches along the Kalyani Expressway contributing to pollution levels. Water quality test of the samples taken from the STP outlet (02 November 2023) by CPCB, in the presence of the officials of WBPCB and Audit, showed that the level of TSS and FC was higher than the permissible limit⁵⁰ in the tested samples.

⁴⁷ Waste Stabilization Pond Technology of total capacity of 22.5 MLD.

⁴⁸ Section 25 of Water (Prevention and Control of Pollution) Act, 1974 *inter alia* provides that no person shall, without the previous consent of State Board establish any treatment or disposal system which is likely to discharge sewage into a stream or well or sewer or on land.

⁴⁹ Existing manholes lying on roads belong to the Public Works Department.

⁵⁰ TSS - 277 mg/l against the permissible limit of 50 mg/l, FC-70 × 10² mg/l against the permissible limit of 1,000 mg/l.



Figure 4.1: A portion of the sewage from nearby drain was being taken to the pumping station for feeding STP.



Figure 4.2: PB Ghat drain falling into Ganga untapped.

In reply, the Department stated (March 2024) that the sewage from PB Drain was tapped partially.

Thus, the main objective of the *Panihati* STP to tap one of the most polluted drains viz. PB Ghat drain was yet to be fulfilled. This was also evident from the Report⁵¹ of WBPCB which stated that the drain had a flow of 4.76 MLD and pollution load above permissible limit⁵².

4.3.2.3 *Naihati* STP

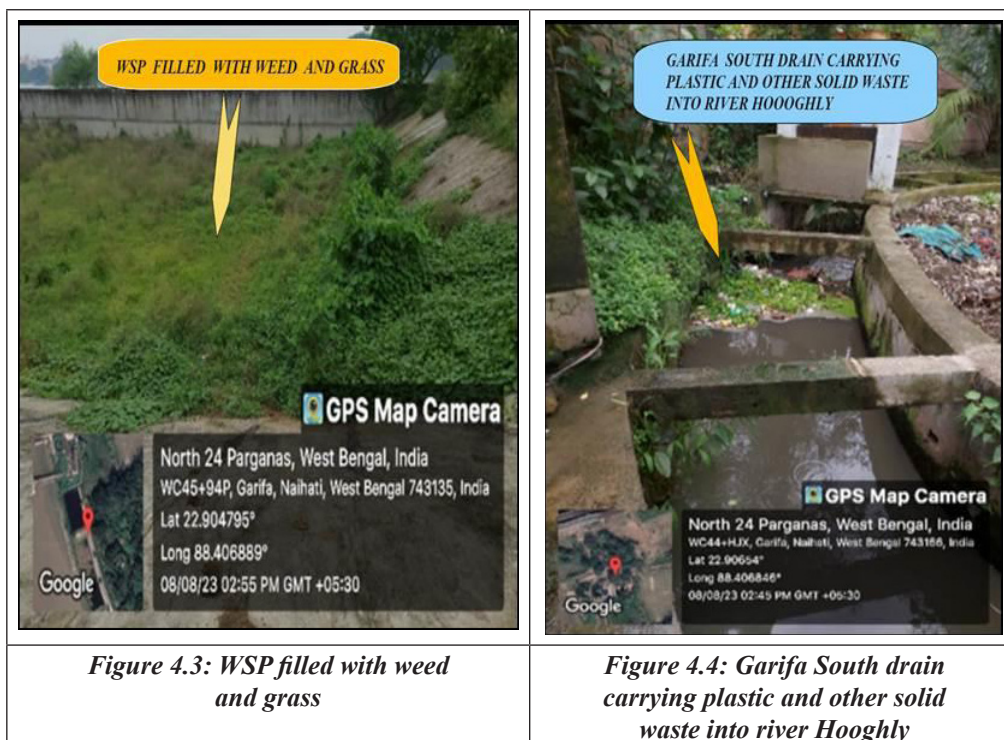
A Sewage Treatment Plant with capacity of 6.5 MLD for *Naihati* Municipality was approved in March 2019 at a cost of ₹ 14.71 crore by NMCG. The scheduled date of completion of the STP was January 2021, however, it was completed in July 2022. The STP was jointly inspected by Audit along with representatives of KMDA in August 2023.

Audit observed that the STP was not in operation since January 2023, due to failure of one of its Waste Stabilization Ponds (WSP). The pond was found to be filled with weed and grass during the joint inspection of the STP by Audit and KMDA.

Audit also noted that the Garifa South Drain, one of the drains connected to the STP, was filled with plastic and other solid waste, and sewage was flowing into the river Ganga, without treatment.

⁵¹ Report on Assessment of Pollution Loads to River Ganga through 56 outfalls by the School of Water Resources Engineering, Jadavpur University.

⁵² COD-102 mg/l, BOD-50 mg/l, TC- 1.6×10^7 MPN/100ml and FC- 5.2×10^5 MPN/100ml.



In reply, the Department stated (March 2024) that due to failure of retaining wall foundation, the STP became non-operational and after rectification work the STP has become functional. KMDA further added that the drain was under control of local ULB (*Naihati Municipality*) and the responsibility of cleaning the drain on a regular basis lies with the ULB.

However, the reply may be seen in view of the fact that KMDA did not furnish any water quality test report in support of the functional status of the STP.

4.3.2.4 Budge Budge STP

The work of setting up of a 9.3 MLD capacity STP, seven lifting stations, one main pumping station, sewerage network and O&M for 10 years in *Budge Budge* Municipal town was awarded in January 2016 to a private agency by the Executive Engineer, West bank Division, Ganga Action Plan (GAP) Sector, KMDA, at a tendered cost of ₹190.09 crore for completion by January 2019.

Audit observed that the house connection work was still in progress, as of November 2023 and ₹135.93 crore had been paid to the contractor. Provisional time extension was given upto September 2023 by KMDA to complete the work. However, the incomplete *Budge Budge* STP was commissioned in February 2022 and was treating only 3.46 MLD of sewage against the required installed capacity of 9.30 MLD.

Joint site inspection (August 2023) revealed that wastewater from *Churial* drain and another unnamed drain were flowing into river Ganga. Sewage from these two drains had not been tapped and diverted to the STP, and thus, untreated wastewater of the drains was adding to the pollution load of the river. Both these drains were also not being monitored by WBPCB.

In reply, KMDA stated (March 2024) that house connection work was in progress and after completion of the work, sewage will be diverted to STP.

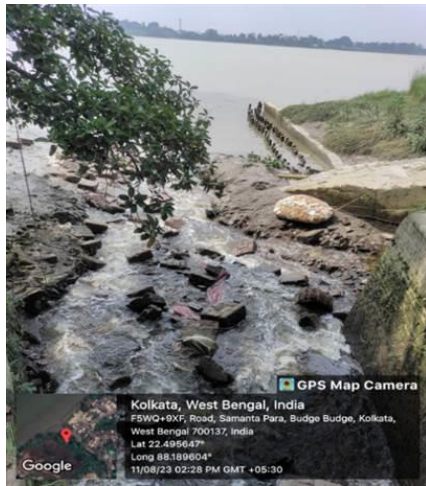


Figure 4.5: Unnamed outfall discharging in River Ganga.



Figure 4.6: Churial drain discharging in River Ganga.

4.3.2.5 Nabadwip STP

The *Nabadwip* STP with a capacity of 10 MLD was installed in 1995 for *Nabadwip* Town. Executive Engineer, Nadia Division, PHED was responsible for the operation and maintenance of the STP. However, the non-operation of the STP was reported in June 2021, by the concerned Executive Engineer, Nadia Division to the Chief Engineer, HQ, PHED. Subsequently, CPCB also reported on the non-operation of *Nabadwip* STP in its Inspection Report (December 2022) and recommended that the STP be made operational with immediate effect.

However, during joint site inspection (November 2023) by Audit with the officials of PHED, it was seen that the STP was still not functioning and PHED had not taken any action to make it operational. **It was also observed that the anaerobic pond was infested with dense vegetation, and the facultative⁵³ and maturation ponds were being used for pisciculture by *Nabadwip* Municipality.**



Figure 4.7: Anaerobic Pond infested with dense vegetation



Figure 4.8: Facultative Pond used for pisciculture.

⁵³ Pond to treat wastewater through sedimentation and anaerobic oxidation of organic materials.

In response to an audit query, PHED stated (June 2023) that the STP had been handed over to the concerned *Nabadwip* Municipality for its operation and maintenance. The reply is not acceptable as the existing wastewater line and pumping works from the MPS to STP were still being maintained by PHED, whereas five waste stabilisation ponds⁵⁴ which are an integral part of this STP, were handed over (November 2013) to the concerned Municipality and were being used for pisciculture.

This indicated that there was absence of a clear delineation of duties between agencies for proper maintenance and monitoring of the created infrastructure to control pollution.

In reply, the Department stated (March 2024) that it would strive to strengthen coordination with the concerned municipality, in future.

4.3.2.6 Uttarpara-Kotrung and Konnagar STP

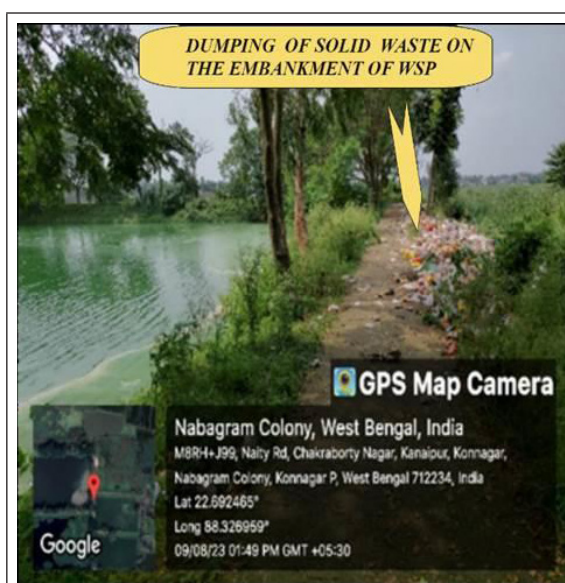


Figure 4.9: Dumping of Solid waste on the embankment of WSP

The work “*Rejuvenation of existing STP along with lifting station and pumping station including sewage network and five years of operation and maintenance at Uttarpara-Kotrung and Konnagar*” in Hooghly District was taken up in June 2020 and completed in July 2022, at a tendered value of ₹ 17.11 crore with a design capacity of 22 MLD.

However, CPCB’s Monitoring report (January-March 2023) showed that the STP was non-compliant with the discharge norms set by NGT. The existing BOD and COD levels in the

treated sewage were 36 mg/l and 64 mg/l respectively against the NGT standards of < 10 mg/l for BOD and < 50 mg/l for COD.

The amount of sewage pumped out at pumping stations must be received at the STP. To ensure that there is no leakage of sewage, flow meters are required to be installed both at the pumping station and at the STP.

Joint inspection of the STP in August 2023, along with representatives of KMDA revealed that though a flow meter was installed at the pumping station, it was not installed at the STP. Thus, the quantum of sewage received at the STP could not be ascertained. Solid waste including plastic waste was found dumped on the embankments of the Waste Stabilization Ponds (WSP).

In reply, the Department stated (March 2024) that the matter of dumping of solid waste had been taken up with the concerned Gram panchayat.

⁵⁴ Two anaerobic ponds, two facultative and one maturation.

4.3.2.7 Baidyabati and Bhadreswar STP

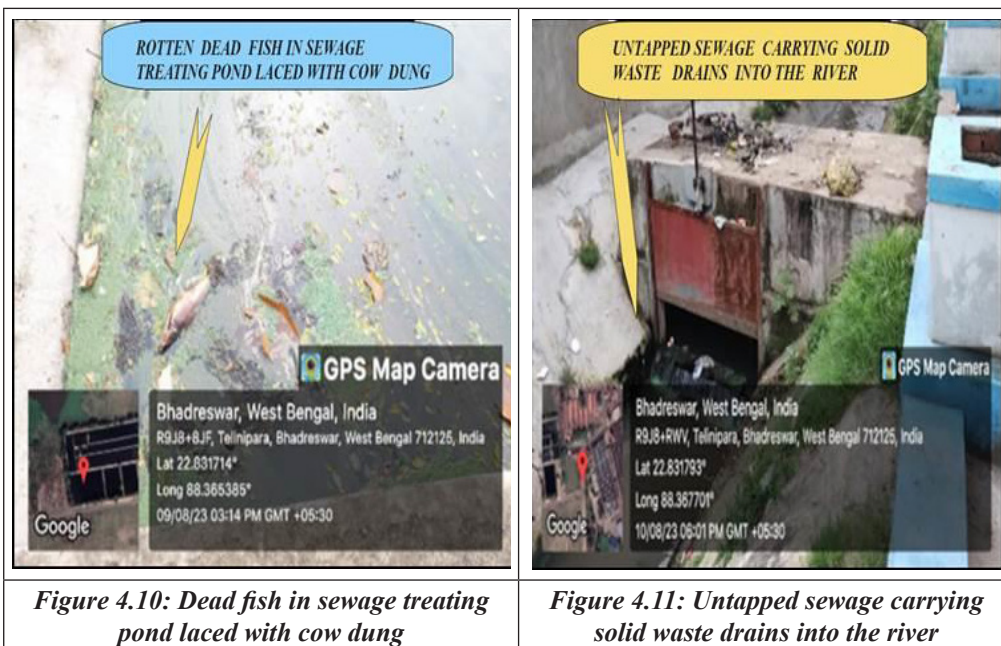
The work “Rejuvenation of existing STP along with lifting station and pumping station including sewage network and five years of operation and maintenance at Baidyabati and Bhadreswar under Hooghly District” was taken up in June 2021 by KMDA and completed in July 2022 at a tendered amount of ₹ 11.78 crore, with a design capacity of 7.60 MLD.

Joint inspection of the STP for *Bhadreswar* in August 2023, along with the representatives of KMDA revealed that the pond water of the STP was laced with cow dung and the water was foamy with dead fish floating in the pond. Audit also observed that the untreated drain water was being allowed to flow into the river Ganga, carrying solid waste, including plastic.

Water quality tests of the sample from the *Bhadreswar* STP outlet done (02 November 2023) by CPCB in the presence of officials of WBPCB and Audit showed that the level of FC (at 22×10^2 MPN/100 ml) was much higher than the permissible limit of 230 MPN/100 ml defined by the NGT.

In reply, the Department stated (March 2024) that slurry of cow dung was entering the STP through drains and DPR was being prepared to tap drains of *Baidyabati* and *Bhadreshwar* Municipalities.

However, the STP did not manage wastewater and ensure discharge standards even though it was under regular operation and maintenance of KMDA.



Thus, from the above illustrative cases on the inspections of the sampled STPs it was evident that the desired objective of installation of STPs was sub-optimally achieved due to factors like under-utilisation of capacity, non-integration of sewage networks and drains with STPs, absence of dis-infection systems and inadequate maintenance of the STP ponds *etc.*

4.3.3 Pollution abatement of Tolly Nullah

Tolly Nullah also called as ‘*Adi Ganga*’ was excavated for the purposes of navigation; however it has presently ceased to be a free flowing channel due

to siltation, rapid dense inhabitation along its banks, dumping of solid waste, discharge of untreated sewage, *etc.* The nullah is connected to river Hooghly at one end and to *Vidyadhari* River at its other end. The nullah carries all types of drainage and municipal wastes from 28 wards of Kolkata Municipal Corporation (KMC) along with three wards of *Rajpur-Sonarpur* Municipality and finally drains into the river *Hooghly*.

The issue of pollution in river *Adi Ganga* first came before NGT in July 2015. However, due to the continued pollution, NGT in its order dated 21 September 2020 (OA 12/2015) directed the KMC to set up an STP by December 2020, remove encroachments, rehabilitate the displaced persons within six months and clear the river of silt and hydrophytes. NGT further directed that KMC should prepare an action plan to deal with accumulation of solid waste underneath the elevated metro station and around the piers within one month and implement the plan within the next month.

In this regard, Audit observed the following:

- KMC prepared a DPR of ₹ 938.89 crore (Phase-I) and ₹ 219.64 crore (Phase-II) for Pollution Abatement Project for Rejuvenation of River *Adi Ganga* under the '*Namami Gange Program*' in August 2022. NMCG approved Phase-I of the project in December 2022 for ₹653.67 crore and issued Administrative Approval and Expenditure Sanctions (AA&ES) for the same in January 2023. However, as of November 2023, AA&ES for Phase-II had not been issued and the tendering process for Phase-I was still underway.
- Besides, dredging work was to be done for both phase-I and II, from State fund. While Phase-I⁵⁵ of the dredging work was completed (May 2023) at a cost of ₹ 10.03 crore, dredging under Phase-II⁵⁶ of *Tolly Nullah* measuring 5.37 kms, (at an estimated cost of ₹ 13.02 crore), was still in progress as of September 2023.



Figure 4.12: Dredging work in progress



Figure 4.13: Dredging work yet to be started

⁵⁵ From the confluence point to Chetla Bridge measuring 4.7 kms.

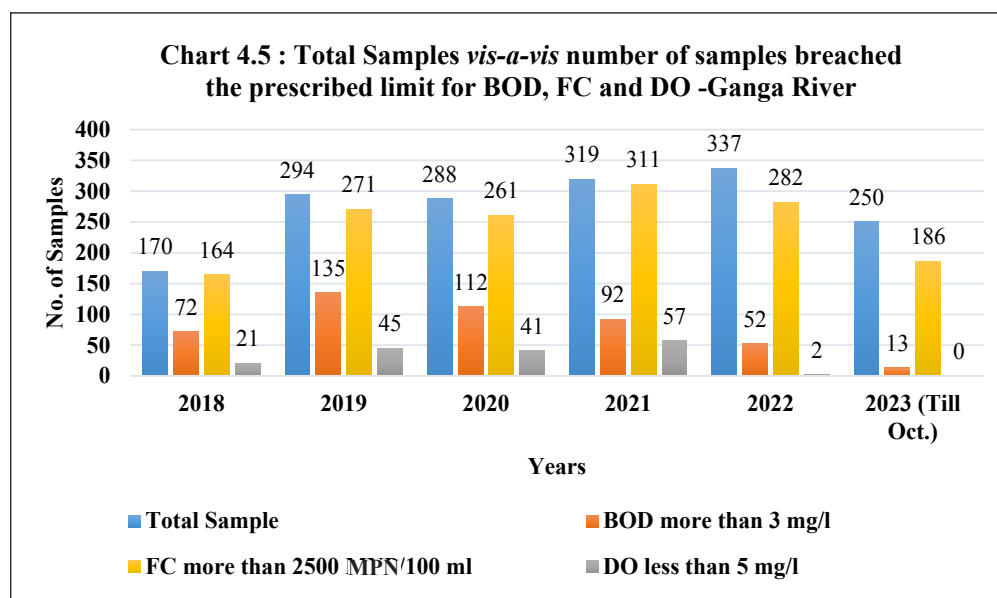
⁵⁶ From Kudghat Metro station to Chetla Bridge (Phase-II).

Thus, the project for pollution abatement of Tolly Nullah could not be completed even after eight years of the matter coming to the notice of NGT, and the untreated sewage of 25.10 MLD continued to flow into river *Adi Ganga*.

In reply, the Department stated (March 2024) that technical evaluation of bids of the project under Phase-I (under NMCG) was under process and the dredging work of Tolly Nullah would be completed by October 2025.

4.3.4 Impact on the water quality of river Ganga

Due to inadequate/inefficient sewage treatment facilities for drains discharging into the river Ganga, the pollutant load in the river water continuously exceeded the prescribed limits during the period 2018-23. While the number of times BOD breached the prescribed limit ranged between 15 per cent to 46 per cent of total tests⁵⁷ conducted, FC was above norms in 74 per cent to 97 per cent of test cases, and DO did not meet the prescribed standards in one to 18 per cent tests. Details of the same are depicted below in **Chart 4.5**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

Recommendation 5:

UD&MA Department should complete the ongoing STPs as well as operationalise the non-functional STPs at the earliest and ensure strict compliance with environmental norms in their operations.

4.4 Pollution abatement of River *Vidyadhari*

The Action Plan for rejuvenation of the river *Vidyadhari* was prepared in July 2019 by PHED encompassing management of municipal wastewater and industrial waste water management. The estimated budget for the plan was ₹ 2,515 crore and projects under it, were to be completed by March 2023.

As per the Action Plan, eight drains were initially identified as carrying 1,539 MLD of sewage from areas of KMC and its vicinity into river *Vidyadhari*.

⁵⁷ Water quality test done by WBPCB under National Water Monitoring Programme.

Further, there were nine existing STPs with a total treatment capacity of 1,233.24 MLD, including 910 MLD being treated naturally in the East Kolkata Wetland.

The work of preparing the DPR for rejuvenation of PRS of *Vidyadhari* was given to IIT, *Kharagpur* by PHED. Audit observed that IIT, *Kharagpur*, while preparing the DPR, had identified numerous other drains with outlets into the river *Vidyadhari*, in addition to the initially identified eight drains of the adjoining urban and semi urban areas which carried untreated sewage, eventually disposing into the river *Vidyadhari*. The report added that the untreated or partially treated industrial effluents from industrial cluster at Calcutta Leather Complex, housing over 500 small-medium industries were discharging about 150 kg of heavy metal Chromium on a daily basis into the urban wastewater channel that was then being drained into fishponds of the East Kolkata Wetlands.

Based on these additional drains highlighted by IIT, the RRC of the State, in its 15th meeting, on 30 September 2022, engaged KMDA to set up additional STPs/FSTPs for six municipalities⁵⁸. The work of setting up these STPs was to be carried out by KMDA. However, Audit observed that as of December 2023, no progress was made in this regard due to unavailability of site.

Audit also conducted a joint inspection of the existing nine STPs in July-August 2023 and observed that sewage with either no treatment or partial treatment, was being discharged into various municipal canals and finally falling into the Vidyadhari River as discussed below.

4.4.1 East Kolkata Wetland

East Kolkata Wetlands (EKW), is an important *Ramsar*⁵⁹ site, situated on the Eastern fringes of Kolkata and spread out over an area of 12,500 hectare⁶⁰. East Kolkata Wetlands Management Authority (EKWMA) works towards conservation and management of EKW. It is estimated that EKW naturally treats around 910 MLD of sewage generated in Kolkata city before discharging into *Vidyadhari* River. In this regard, Audit observed the following:

- EKWMA and CPCB conducted (October 2019) a study which identified the EKW as under immediate threat of species extinction and habitat destruction due to anthropogenic factors. The study showed that the sewage that enters the Wetlands consists of toxic and non-biodegradable matter, including a range of heavy metals. The result of sample test (9th, 16th and 23rd December 2018) conducted by CPCB of the raw sewage showed that pH of the sewage was alkaline (7.76 to 8.03), DO was completely absent and BOD varied from 39 to 87 mg/l. The analysis of the samples from the Wetland of EKW also indicated presence of heavy metals such as lead, cadmium, chromium.

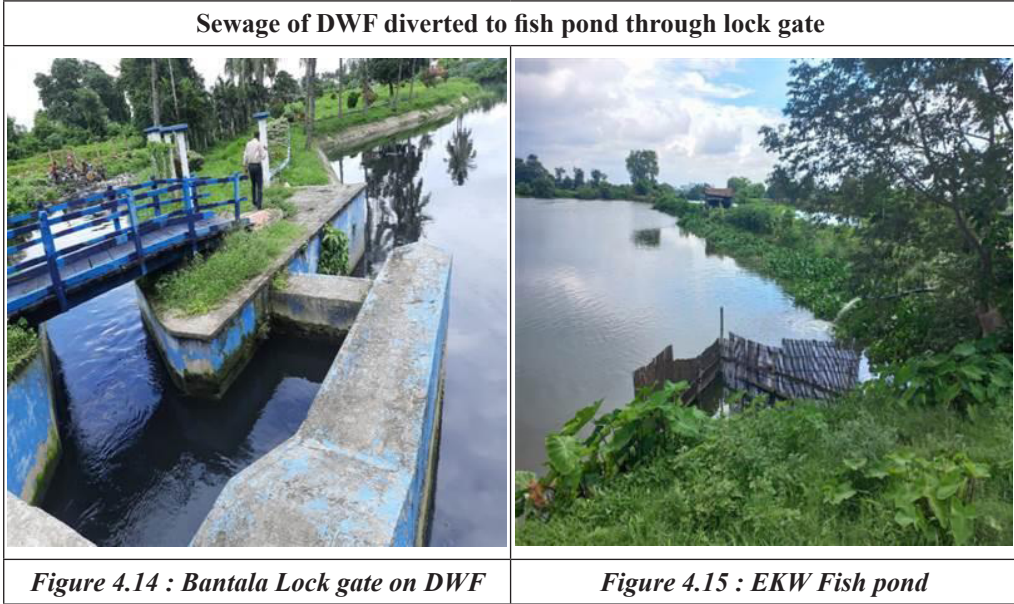
⁵⁸ i) Barasat, ii) Dum Dum, iii) Madhyamgram, iv) North Dum Dum, v) New Barrackpore and vi) Rajarhat Gopalpur.

⁵⁹ A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention, also known as “The Convention on Wetlands”, an international environmental treaty signed on 02 February 1971 in Ramsar, Iran, under the auspices of UNESCO.

⁶⁰ Approximately 45.93 *per cent* comprises water bodies and 38.92 *per cent* is agricultural land. The remaining portion is occupied by urban and rural settlement (10.42 *per cent*) and sites for garbage disposal 4.73 *per cent*.

- In consideration of the ecological importance of the EKW, WBPCB was supposed to carry out water analysis tests of EKW. Audit noted that a quality analysis of water of EKW at two outlets⁶¹ had been carried out by WBPCB during June 2018 to May 2019 (once in a month), but thereafter, no such tests were carried out. These tests revealed that as against permissible limits prescribed by the MoEFCC, the level of BOD exceeded the prescribed limit by seven times, TSS was 14 times higher and FC was in excess of 24 times of permissible level.

Joint site inspection of EKW (July 2023) revealed that the sewage flowing through Dry Weather Flow (DWF) was diverted into sewage fed fishery ponds at *Bantala* lock gate. However, there was no flow meter or other measuring mechanism to assess the actual quantity of wastewater diverted to the fish ponds. Thus, the quantity of wastewater treated through sewage fed fish ponds of EKW could not be ascertained.



Further, surveillance of physicochemical and biological properties of the wastewater that entered into EKW was not undertaken by WBPCB. In the absence of a continued monitoring mechanism, the qualitative nature of the sewage entering EKW and the efficiency of sewage treatment through aquaculture could not be assessed.

In reply, the Department stated (March 2024) that it was decided that flow meters would be installed by KMC at different points of the canals to measure the volume of sewage passing through EKW. It also added that CPCB had fixed two points within EKW where water quality sewage would be monitored. WBPCB stated (March 2024) that henceforth it would monitor water quality on a regular basis and data would be uploaded in the portal.

However, due to the absence of regular monitoring of the sewage in EKW, the adequacy of the natural treatment process and requirement of further remedial measures such as setting up of STPs, treatment of hard metals *etc.* could not be assessed.

⁶¹ Bamanghata Jalpath and Uttar hatgachha.

Recommendation 6:

WBPCB should bring EKW into its regular monitoring schedule and plan for effective remedial measures.

4.4.2 Operational status of Bangur STP

Figure 4.16: Primary Clarifier at the STP

The STP at *Bangur* with an installed capacity of 52 MLD was in operation since 2011. The STP treats wastewater from part of North Kolkata and *South Dum Dum* Municipality and discharges into *Bagjola* canal which ultimately falls into the river *Vidyadhari*. The STP received about 26 MLD raw sewage generated from parts of North Kolkata and *South Dum Dum* Municipalities. However, the treated wastewater of the STP was not being re-used and was being drained out into *Bagjola* canal. It was noted

that the STP does not have chlorination facility required for bacteriological disinfection and the treated sewage was discharged into the *Bagjola* canal laced with heavy concentration of faecal coliform. Water Analysis Reports for the period December 2022 to March 2023, as made available by KMC revealed that the treated wastewater was not compliant with treated discharge standards⁶².

Water quality test of the samples from the *Bangur* STP outlet conducted (November 2023) by CPCB in the presence of officials of WBPCB and Audit showed that the level of FC (49×10^2 MPN/100 ml) was much higher than the permissible limit of 1,000 MPN/100 ml.

Thus, the STP could not bring pollution load of sewage down to the prescribed level and continued to discharge treated sewage containing FC above prescribed limits due to absence of chlorination facilities.

In reply, the Department stated (March 2024) that tender would be floated soon for installation of chlorination facility.

4.4.3 Kestopur/Bagjola STP

The *Kestopur/Bagjola* STP, with an installed capacity of 27.27 Million Litre per Day (MLD), was receiving 19 MLD sewage from Salt Lake area. Section 17(f) of the Water (Prevention and Control of Pollution) Act, 1974 required WBPCB to inspect STPs regularly. However, against these norms, it was noted that WBPCB had not carried out inspection of the STP during 2018-19 to 2022-23.

⁶² As set in NGT order dated 30.04.2019 in OA 1069/2018 for parameters like BOD at 15-19 mg/l, TSS at 26-30 mg/l and FC at 14,706-46,808 MPN/100 ml.

Further, as per the Water (Prevention and Control of Pollution) Act, 1974, any STP is required to obtain a CTO from the relevant Pollution Control Board before commencing actual operations. However, Audit observed that the *Kestopur/Bagjola* STP was functioning without CTO and thus remained outside the regular monitoring of WBPCB for environmental compliances.

As per the latest (September 2023) water quality test report of the STP, the value of BOD in *Kestopur/Bagjola* STP was 18 mg/l, COD 60 mg/l and the FC level was 6,500 MPN/100 ml, which were not compliant with the discharge norms of NGT.

The joint inspection of the site by Audit & Engineers of the UD&MA Department (10 August 2023) revealed that the treated wastewater was not being re-used and was drained out into *Dum Dum Cantonment Canal* which later joins with *Vidyadhari* river through the *Bagjola* canal. It was noted that chlorination of treated effluents was also not done before discharging the treated water into the canal as there was no facility for chlorination at the STP. Thus, the treated sewage was loaded with heavy concentration of faecal coliform.



Figure 4.17: Treated water discharging into outlet drain



Figure 4.18: Treated water discharging into Bagjola canal through Dum Dum Cantonment canal

Thus, it is evident that the action plan for rejuvenation of river *Vidyadhari* was not implemented within the stipulated time period of March 2023. Further, STPs were not fully equipped to treat wastewater and there was lack of continuous monitoring system for drains which impaired the adequacy and efficiency of the remedial interventions for river *Vidyadhari*.

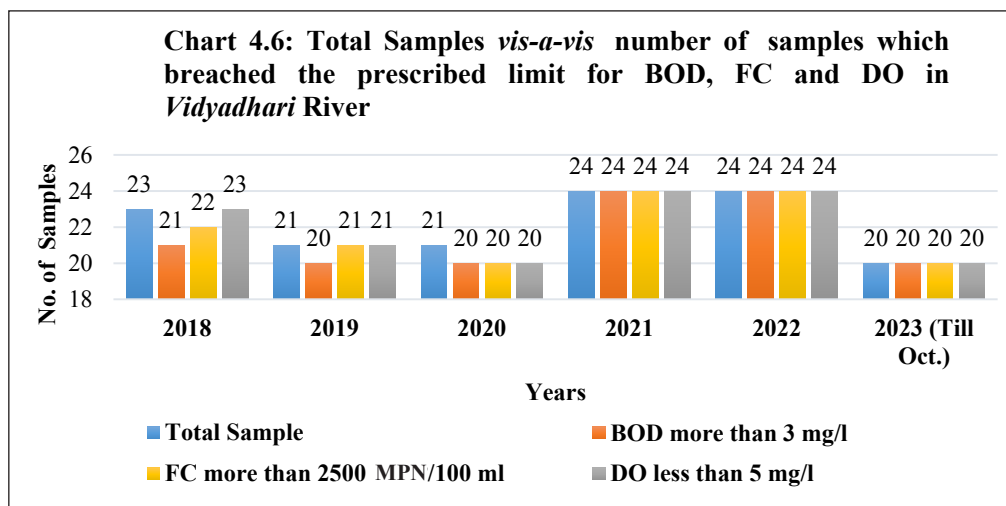
4.4.4 Impact on the water quality of the river *Vidyadhari*

WBPCB monitored the water quality at two different locations⁶³ on this river. Audit scrutiny of the results of the water quality analysis for the period 2018-23 (upto October 2023) showed that the quality parameters of the river water regularly did not meet the approved standards. During 2018-23 (up

⁶³ Upstream-Harora Bridge and downstream-Malanchara Burning ghat.

to October 2023), the water quality analysis of river *Vidyadhari* was done 132 times by WBPCB, and it was noticed that the standards for BOD were breached 129 times in the range of 3.19-29.64 mg/l, for FC 131 times in the range 4,000 -3,00,000 MPN/100 ml, for DO 111 times in the range 0.1-4.6 mg/l.

Regular failure of the river water in meeting prescribed quality standards on parameters like BOD, FC and DO underlined unabated sewage contamination of the river water as shown in **Chart 4.6**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.5 Pollution abatement of River *Mahananda*

The river *Mahananda* originates in *Darjeeling* District and enters *Siliguri* town at *Champasari* area. The river is non-tidal in nature and receives substantial amount of municipal sewage round the year from *Siliguri* city. In absence of effective remedial measures, the untreated sewage continued to flow into the river *Mahananda* resulting in further deterioration of its water quality. As a result, during the period 2018-22, the river had been degraded (i.e. from priority II to I) by CPCB. In this context, Audit observed the following:

4.5.1 Inordinate delay in finalisation of the DPR for constructing the STPs

According to the Action Plan for rejuvenation of PRS-*Mahananda* River, which was prepared (July 2019), by the Siliguri Jalpaiguri Development Authority (SJDA), there was no functional STP for treating the 44 MLD of sewage draining into the river through eight major drains on the right bank and 12 on the left bank of the *Mahananda River*. The main objective of the Action Plan was to treat municipal sewage flowing into the rivers *Mahananda* and its tributaries *Jorapani* and *Fuleswari*.

Accordingly, the Plan envisaged (July 2019) setting up of two STPs⁶⁴ with a total capacity of 47 MLD in *Siliguri* town. The STPs were to be completed within a period of 1.5 to five years. SJDA was entrusted with the task of management of municipal wastewater and setting up of STPs. Further UD&MA Departmental contemplated another STP at the right bank of River *Mahananda*.

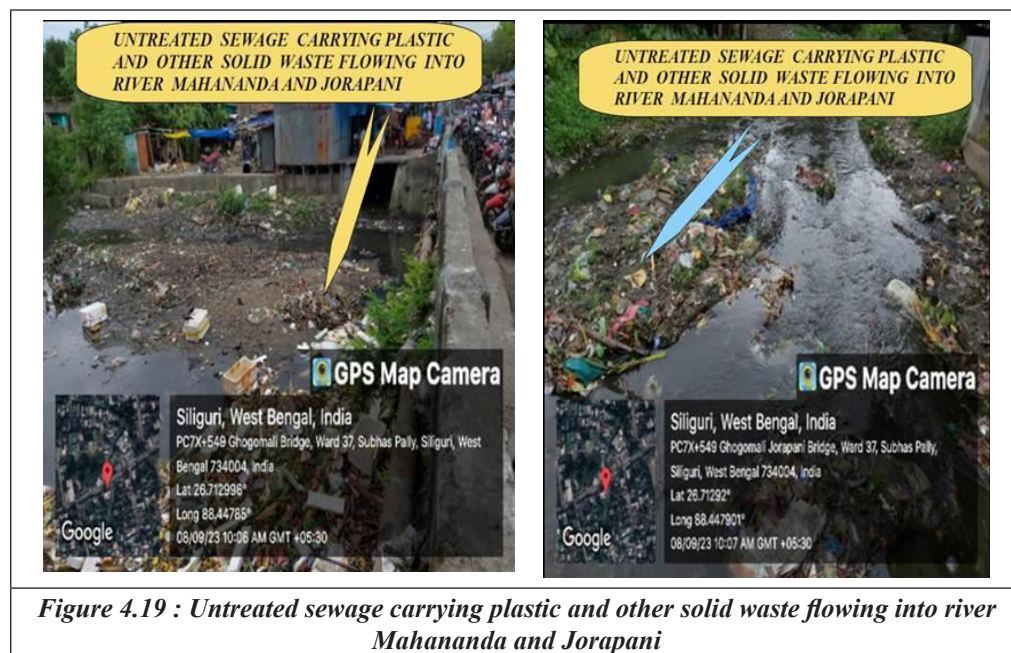
⁶⁴ Naukaghat (32 MLD) and one at Jorapani (15 MLD).

Audit observed that prior to preparation of the said Action Plan, SJDA had invited EOI in June 2018 for the preparation of a DPR to operationalize two existing but incomplete STPs (STP II and STP III) on the river *Mahananda*. This DPR which was prepared by SJDA was vetted by KMDA and its finalization took more than two years due to lack of effective co-ordination between the two entities. Finally, the DPR was submitted (February 2021) to the UD&MA Department for Administrative Approval.

However, the UD&MA Department, GoWB did not accord Administrative Approval for the work due to change in scope of work and therefore KMDA was assigned the task of preparing a fresh DPR for the project (*i.e.* for rehabilitation of STP-II and STP-III) in January 2022. This DPR was prepared and approved in June 2022, based on which, KMDA awarded (May 2023) the work⁶⁵ of Rejuvenation and Augmentation of existing two STPs at a total tendered cost of ₹ 73.33 crore to a private agency.

In respect of STP-I on the right bank of *Mahananda*, an agency was engaged by KMDA to prepare a DPR for the 48 MLD STP. Approval of the DPR was pending till August 2023 although the project was scheduled to be commissioned by March 2025 as per the affidavit submitted (March 2023) by State Government to NGT⁶⁶.

Thus, due to delay in finalisation of DPR for about 42 months, it was noted that sewage treatment infrastructure for river *Mahananda* was non-operational. Audit conducted a joint physical inspection (September 2023) of major drains near Surya Sen Park, Noukaghat with the officials of KMDA and found that the untreated sewage of the drains, carrying plastic and other solid waste, were draining into rivers *Mahananda*, *Jorapani* and *Fuleshwari*.



⁶⁵ Rejuvenation and Augmentation work for existing two STPs (54 MLD) including Interception and Diversion network for tapping existing drains falling into the River Mahananda (from the eastern bank) including operation and maintenance for a period of five years.

⁶⁶ OA_10 of 2016.

In reply, the Department stated (March 2024) that the work of rejuvenation of STP-II and STP-III was ongoing and was expected to be completed by June 2025 and added that the DPR for STP-I had been submitted in February 2024.

4.5.2 Interim measures

Due to continued delay on the part of relevant authorities in taking remedial action for controlling water pollution on the river *Mahananda*, a Committee for assessment of environmental compensation was appointed by NGT *vide* order dated 20 September 2021. The Committee assessed that an environmental compensation of ₹ 2.40 crore was to be paid and directed SJDA to deposit the amount with the District Magistrate, Darjeeling. This amount would be used for taking up works related to restoration of water quality of the river. SJDA accordingly deposited ₹ 2.00 crore with District Magistrate, *Darjeeling* as an interim compensation.

It was noticed in Audit that, out of the above ₹ 2.00 crore received as part of interim measures, the DM had taken up (December 2022) works of an estimated value of ₹ 0.80 crore⁶⁷, which *inter alia* included setting up of *in-situ* bioremediation work at two locations⁶⁸.

Audit conducted joint physical inspection (September 2023) of both the work sites with the official of KMDA and found that at *Naukaghat* the drain and the area abutting the drain were filled with plastic and other solid waste. The untreated sewage was passing into the river carrying solid waste. Further, at *Surya Sen Park* the wheel paddle aerator was not functioning and was clogged with plastic and other solid waste. The area abutting the drain was also littered with plastics and other solid waste.

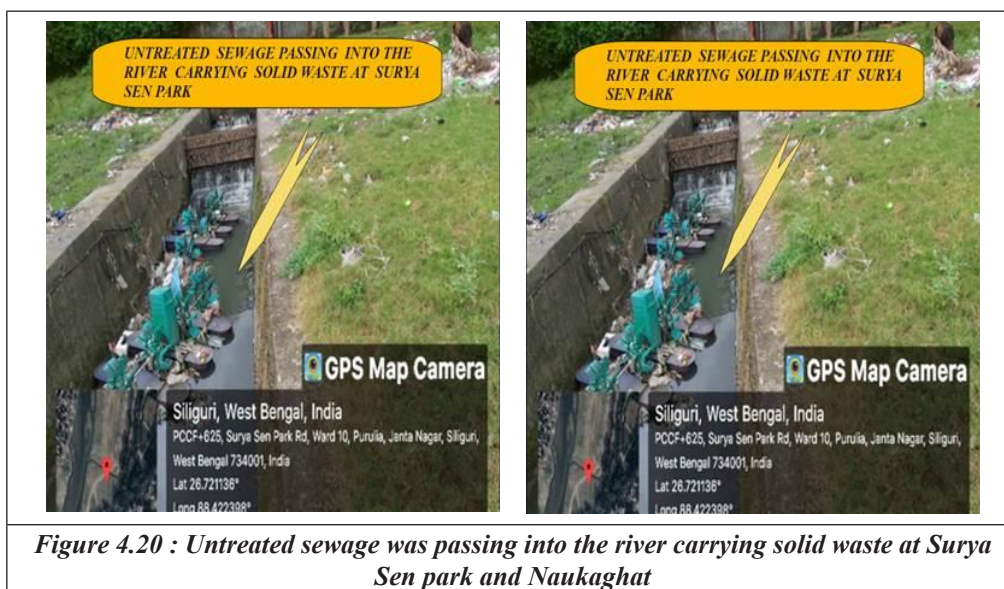


Figure 4.20 : Untreated sewage was passing into the river carrying solid waste at Surya Sen park and Naukaghat

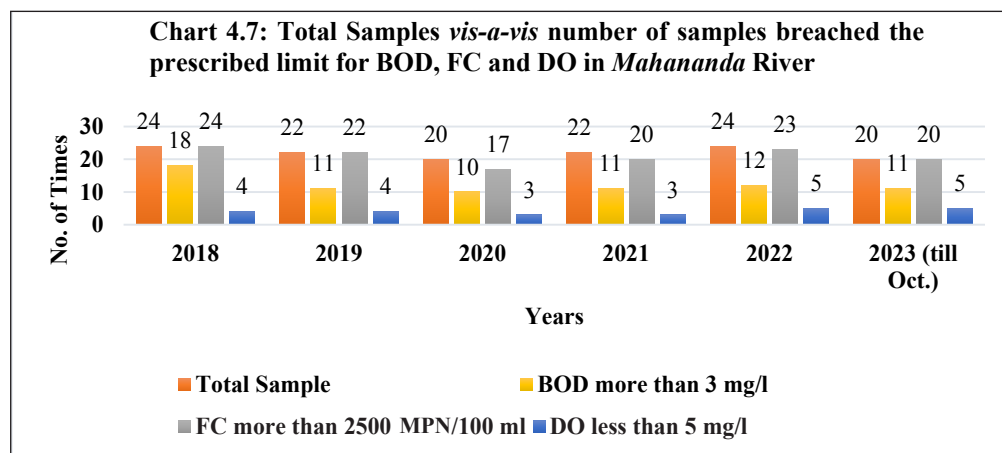
⁶⁷ (i) ₹ 0.21 crore -Installation of iron grates at the major drains falling into the river *Mahananda* at *Siliguri* Town, (ii) construction of public toilets at ₹ 0.45 crore and (iii) in-situ bioremediation work for two number of drains at ₹ 0.13 crore.

⁶⁸ (i) *Naukaghat* with cascading technology and (ii) *Surya Sen Park* with wheel paddle aerator technology.

Audit further observed that in the 16th River Rejuvenation Committee (held at the level of the Member Secretary, WBPCB, being the chairman of RRC) meeting held on 30 June 2023, the issue of pollution of the river due to discharge from cattle sheds near *Siliguri* was flagged. However, no effective remedial action was taken.

4.5.3 Impact on water quality of *Mahananda* River due to prolonged delay in implementation of Action Plan

The delay in implementation of remedial measures to control water pollution on the river *Mahananda*, deteriorated the quality of the river water over a period. Audit observed that as per the *water quality tests conducted by WBPCB* during the period 2018-23, the BOD, COD and FC exceeded the prescribed limits set by CPCB as shown in **Chart 4.7**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.6 Pollution abatement of River *Mayurakshi*

River *Mayurakshi* originates in Jharkhand, flows through the districts of *Birbhum* and *Murshidabad* in West Bengal before draining into the river Ganga. The 95.00 km stretch of this river from *Suri* to *Durgapur*, had been identified as a Polluted River Stretch (PRS) by CPCB. An Action Plan for Rejuvenation of the *Mayurakshi* River was submitted by RRC, West Bengal to the CPCB, in September 2020.

According to the Action Plan, *Suri* (up-stream town) and *Sainthia* (down-stream town) were the two major towns in the catchment of the identified polluted stretch, with a total of 26 drains⁶⁹ contributing to the pollution of the river with an aggregate sewage of 6.72 MLD⁷⁰. At the time of identification of the PRS, the BOD level of the river was 5.2 mg/litre and therefore, the river was put under the category of Priority-V by CPCB in 2018.

Under the approved Action Plan, the Municipal Engineering Directorate (MED) of UD&MA Department was charged with management of municipal wastewater. Further, it was also proposed to set up structures for primary

⁶⁹ 12 at *Suri* and 14 at *Sainthia*.

⁷⁰ *Suri*: 4.04 MLD and *Sainthia*: 2.68 MLD.

treatment of wastewater⁷¹ at the 26 drains by providing screens, sedimentation tanks, disinfection facilities (by due date of June 2021).

4.6.1 Primary treatment facilities for municipal wastewater at *Suri* and *Sainthia*

The UD&MA Department, GoWB accorded (March 2020) Administrative Approval of ₹ 78.96 lakh and ₹ 86.26 lakh for setting up of primary treatment facilities for municipal wastewater at *Suri* and *Sainthia*, respectively. These works were to be carried out by Executive Engineer, Birbhum Division, MED with May 2022, as the stipulated completion date.

Audit observed the following:

- Primary treatment of wastewater structures at *Suri* was not completed (till September 2023) for the 12 identified drains because the required land for the project could not be arranged by the Suri Municipality.
- The Executive Engineer, MED, *Birbhum* awarded (June 2021) the work -“In-situ and Ex-situ works for biological water treatment of drainage water for environment remediation of *Sainthia* Municipality” to a contractor at an estimated cost of ₹ 82.59 lakh to be completed within 12 months. However, progress of the work was only 70 *per cent* and no further funds were allocated for the project by the UD&MA to the Executive Engineer, MED, *Birbhum*.
- Further, as per the site inspection Report by the MED, the sustainability of the bio-remediation work depended upon diversion of existing drains and other minor adjustments, which would involve additional costs beyond the original DPR sanctioned amount. Accordingly, these additional works of in-situ and ex-situ biological water treatment of drainage water for environment remediation of *Sainthia* were awarded in June 2022 at a tendered amount of ₹ 26.72 lakh by the Executive Engineer, MED, *Birbhum* to a private agency with scheduled date of completion being within six months from issue of work order. Work valuing ₹ 9.97 lakh was completed till May 2023, with a physical progress of 40 *per cent* and no payment thereof was made to the Executive Engineer, MED, *Birbhum* by the UD&MA Department till September 2023.

Joint physical inspection of the bio-remediation work along with the officials of MED (September 2023) revealed that the construction of earthen embankment and the linking of existing drains to the treatment facilities were not completed, and therefore the primary treatment facilities could not be put to use, as shown in **Figure 4.21**.

⁷¹ (i) Biological water treatment, (ii) Construction of Chlorination system.



Figure 4.21 : In-complete bio-remediation works for treatment of drain water at Sainthia

Thus, the bio-remediation work could not be completed in any of the identified outfalls for *Suri* and *Sainthia* towns till September 2023, and the untreated sewage continued to discharge directly into the river *Mayurakshi*. This rendered the entire expenditure of ₹ 42.22 lakh⁷² on the primary wastewater treatment facilities at *Sainthia* town unfruitful as the intended outcome of treating municipal wastewater could not be achieved even after the lapse of more than one year from the scheduled date of completion (May 2022).

4.6.2 Delisting of the river from the list of PRS in disregard to the norms of CPCB

The ‘Guidelines for Water Quality Monitoring’ issued (December 2007) by CPCB require that sampling stations should be located upstream and downstream of significant pollution outfalls like city sewage drains and industrial effluent outfalls.

The water quality status of the river *Mayurakshi* was monitored by the WBPCB under the National Water Monitoring Programme on a monthly basis at the Water Intake Point for *Suri* Town i.e. up-stream of the river *Mayurakshi*. The 95 km polluted river stretch had no other monitoring station in its downstream stretch.

Audit observed that WBPCB had carried out wastewater analysis for *Sainthia* Municipality (downstream town) in June 2020, and the analysis report highlighted that the BOD levels (mg/l) were in the range of 5.37-65.83 and FC (MPN/100 ml) was in the range of 1,200-5,800, breaching the prescribed limits⁷³. Since June 2020, wastewater quality analysis was not carried out by the WBPCB for the downstream town of *Sainthia*.

It was, however, observed that based on the water quality report of only the upstream water at *Suri*, without conducting test on the downstream at *Sainthia*, the river *Mayurakshi* was delisted from the polluted river

⁷² ₹ 32.25 lakh + ₹ 9.97 lakh.

⁷³ BOD-3 mg/l and FC- 2,500 MPN/100 ml.

stretches (Priority-V) in September 2022 by CPCB. Further, none of the primary treatment of wastewater structures as envisaged in the Action plan for management of sewage were completed for either of the catchment towns (*i.e. Suri and Sainthia*) till September 2023.

In reply, the Department stated (March 2024) that setting up of another water monitoring station at a downstream town was under consideration.

4.7 Pollution abatement of river *Dwarka*

The *Dwarka* River is a tributary of River *Bhagirathi*. The *Dwarka* originates in Jharkhand, flows through *Birbhum* district and finally flows through *Murshidabad* district, where it joins the River *Bhagirathi*. The *Tarapith* to *Sadhak Bamdeb Ghat*, about 1.5 km long stretch of this river has been identified as “Polluted”. The river is non-tidal in nature and receives domestic wastewater from the adjoining area of the *Tarapith* Temple round the year. BOD and FC are the principal pollutants in this river stretch.

The work of construction of an STP with a capacity of 4.25 MLD including two lifting Stations and sewer line was awarded in February 2020 by *Birbhum* Division, PHED. This STP was partially completed and commissioned in September 2022, at a cost of ₹ 25.88 crore. Yet the household sewage connection system to feed the STP was not implemented by PHED. A DPR was prepared and submitted to the PHED in January 2021 by the Chief Engineer, Planning & Water Quality Monitoring, PHED, but the proposal was administratively approved only in June 2022, *i.e.* almost 1.5 years after the proposal. As of September 2023, only one component of the integration work had been tendered at a cost of ₹ 0.29 crore. ***As a result, all the eight major identified drains contributing to pollution of the river continued discharging into the river.***



Figure 4.22 : Untapped Drains discharging into the river

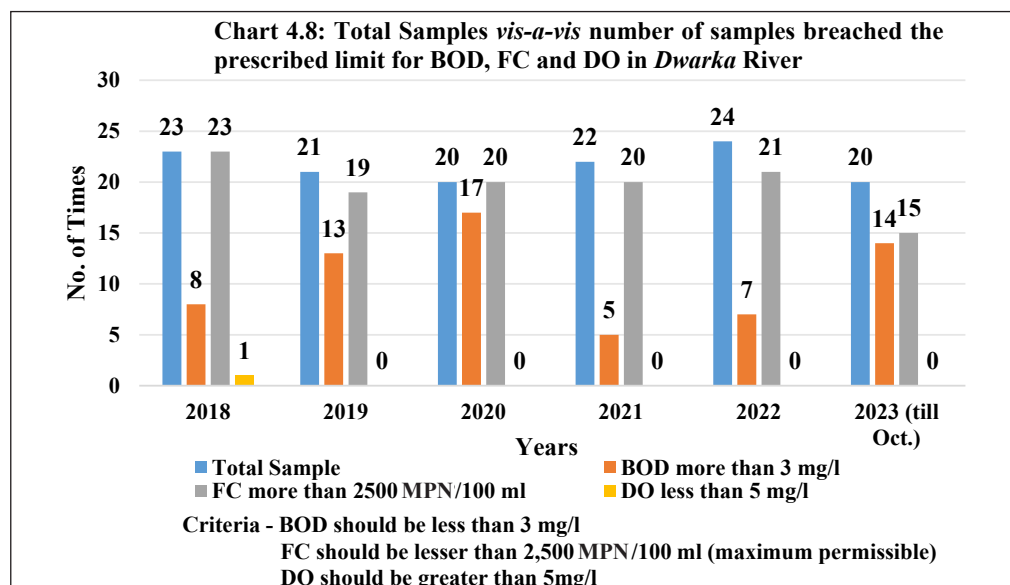
Audit further observed that 30 hotels were discharging waste directly into the river. Though the issue was discussed in the RRC meeting (16th meeting June 2023) and accordingly the implementing agency, PHED had handed over the list of the hotels to WBPCB, action was not taken to stop the discharge of untreated sewage from the hotels into the river.

Thus, inability of the implementing authority, PHED in timely taking up the integration of household sewage collection system with the STP coupled with inaction of WBPCB in restricting the hotels from unauthorised discharge directly into the river led to deterioration in the water quality of the river.

In reply, the Department stated (March 2024) that the scope for integration of various components to STP was included at a later stage and the work was delayed as the area was congested and crowded. The reply is not tenable as the scope for integration of various components to STP should have been considered before the work of construction of the STP was awarded.

4.7.1 Impact on water quality of Dwarka River

Audit observed that due to non-integration of household sewage collection system with STP, the water quality of river Dwarka deteriorated as was evident from the water quality tests conducted by WBPCB during 2018-23, where the number of times BOD breached the prescribed limit ranged between 23 per cent to 85 per cent of total times the tests were conducted while FC was found to have breached the limit in a range between 75 per cent to 100 per cent as shown in **Chart 4.8**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.8 Pollution abatement of Mathabhanga and Churni

The river *Mathabhanga* originates from the river *Padma* in *Bangladesh*, enters India at the *Gede* of *Nadia* district, and terminates near *Majhdia* splitting into two portions, one moving down south draining into the Bay of Bengal, and the other moving towards southwest as the river *Churni* to meet the Ganga at *Payradanga* in *Nadia* district.

According to the Action Plans of *Churni* and *Mathabhanga* prepared by KMDA and PHED respectively (July 2020) and proposed by RRC for approval of CPCB, the causes of pollution of these two river stretches were:

- (i) Untreated industrial wastewater discharge from a sugar mill in *Darshana* in *Bangladesh* (untreated trade effluent in the river three-to-four times during the year).
- (ii) Municipal sewage discharge from *Ranaghat* Town.

Records showed that the matter relating to effluent discharge from the sugar industries of *Bangladesh* was taken up with the Foreign Ministry (of *Bangladesh*) by the Ministry of External Affairs, GOI.

Approved Action Plan of the river *Churni* (July 2020) envisaged construction of three STPs along with Interception and Diversion (I&D) network for existing nine drains at the *Ranaghat* municipality at an estimated cost of ₹ 48.63 crore. Subsequently, total 14 drains were identified during detailed survey at the time of preparation of the DPRs. These projects were to be implemented by KMDA. In this regard Audit observed:

- Out of three STPs, KMDA awarded (November 2021) the job of construction of two STPs⁷⁴ with I&D Network for existing six number of drains falling in River *Churni* (including five years of Operation & Maintenance Period) to a contractor.
- The work was awarded (November 2021) at a tendered cost of ₹ 45.19 crore with November 2023 as the stipulated date of completion. As of October 2023, ₹ 7.07 crore was paid to the contractor by KMDA and only 27 per cent of the work was completed.
- In respect of the other proposed STP at *Chaitanya Ghat* with a capacity of 5.2 MLD which was planned for the remaining eight drains, the work could not be started, as land for the same had not been obtained by KMDA.

In reply, the Department stated (March 2024) that the work of two ongoing STPs would be completed by July 2024 and the work of remaining one STP (5.2 MLD) would commence after purchase of land.



Figure 4.23: Drains falling into the River Churni

⁷⁴ 4.0 MLD capacity at Sreenathpur and 2.6 MLD at Silver Jubilee Road.

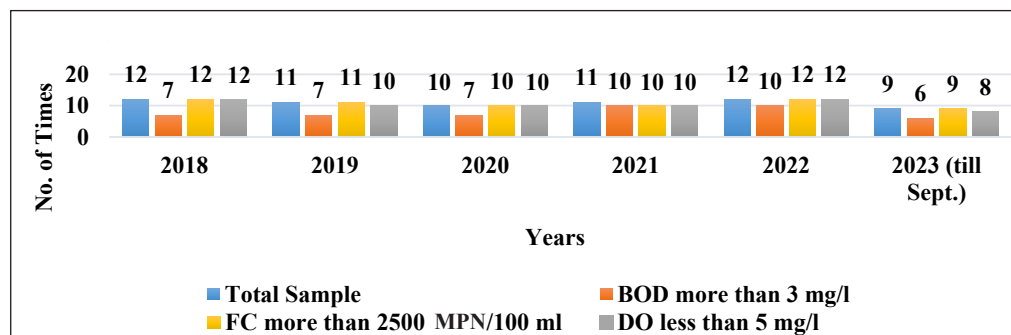
Thus, slow progress in the construction of STPs in *Ranaghat* town resulted in further degradation of the water quality of *Churni* and *Mathabhanga*.

4.8.1 Impact on water quality of *Mathabhanga* and *Churni* Rivers

(A) *Mathabhanga* River

During the period 2018-23, tests were conducted by WBPCB wherein it was observed that the number of times BOD breached the prescribed limit, ranged between 58 per cent to 83 per cent. Similarly, FC breached the prescribed limits between 75 per cent to 100 per cent of times and DO did not meet the prescribed standards between 89 per cent to 100 per cent, as shown in the **Chart 4.9**.

Chart 4.9: Total Sample vis-a-vis number or samples breached the prescribed limit for BOD, FC and Do in *Mathabhanga* River

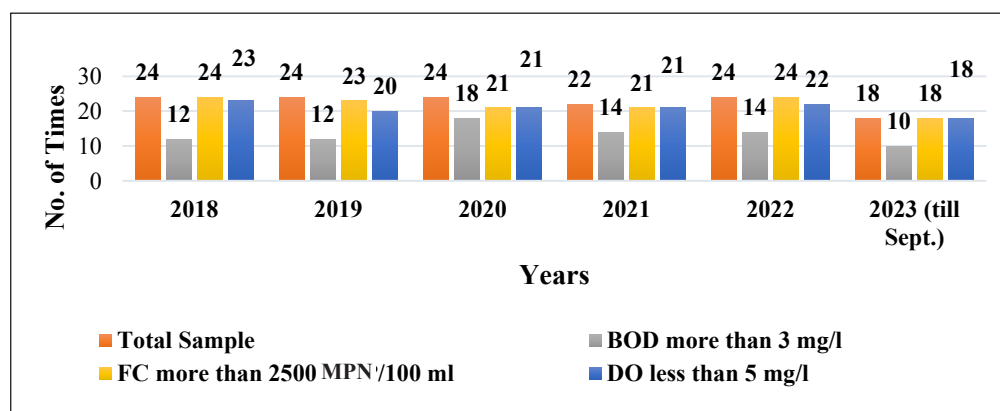


(Source: Water quality data of WBPCB under National Water Monitoring Programme)

(B) *Churni* River

During 2018-23 while the number of times BOD breached the prescribed limit ranged between 50 per cent to 75 per cent of total times tests were conducted, for FC it ranged between 88 per cent to 100 per cent, and DO did not meet the prescribed standards in 83 per cent to 100 per cent test cases, as shown in the **Chart 4.10**.

Chart 4.10: Total Sample vis-a-vis number or samples breached the prescribed limit for BOD, FC and Do-*Churni* River



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.9 Non-utilisation of sewage treatment facility for *Mirik* Lake

The hill town *Mirik*, in *Darjeeling* district is centered around tourism with *Mirik* lake being the focal point. This central lake has been losing its aesthetic value

due to growing anthropogenic activities besides natural causes like siltation. WBPCB's water quality reports of the lake water reflected this deterioration.

Gorkahaland Territorial Administration (GTA) prepared a DPR in 2013 for improvement of drainage and sewerage system in *Mirik*. Following the revision of discharge standards for treated effluents by MoEF&CC in November 2015, GTA revised the DPR without altering the sanctioned amount of ₹ 37.39 crore. The DPR envisaged construction of three STPs having sewage treatment capacity of 1,200⁷⁵ Kilo Litre Per Day (KLD) for different wards of *Mirik* Municipality. The STPs were completed in June 2019 after an expenditure of ₹ 36.30 crore was incurred by the GTA. However, the STPs were not operationalized.

Subsequently, *Mirik* Notified Area Authority took possession of the three STPs in February 2023. However, as house to house connections for feeding through the sewer network to the STPs were not included in GTA's DPR, MED prepared a DPR of ₹ 8.61 crore for house service connection along with three years Operation and Maintenance in February 2023. It was noted that despite a lapse of 50 months from completion of the STPs, work had not commenced till August 2023.

Audit conducted a joint physical inspection of the three STPs, along with representatives of the Division Office, MED, *Siliguri*, *Mirik* Municipality and the WBPCB in September 2023. This inspection revealed that:

- All the three STPs were not functional since completion of their construction as none of the drains were connected and work for house-to-house connection had not been taken up.
- Untreated sewage was flowing into the lake water and coloured wastewater was noticed beside an outfall to the lake.
- The lake water was found to be eutrophic.
- As no dredging work was carried out in the lake, sediment deposition was observed.
- Though WBPCB's water quality analysis reports of the lake indicated non-compliance with the stipulated standards, no remedial actions such as arresting discharge of untreated wastewater into the lake and periodic dredging of the lake were found to have been taken. Chairman, *Mirik* Municipality stated that due to paucity of fund, remedial action could not be taken.

⁷⁵ i.e. STP 1 (600 KLD), STP 2 (300 KLD) and STP 3 (300 KLD).



Figure 4.24: Untreated sewage along with coloured effluent flowing into the lake

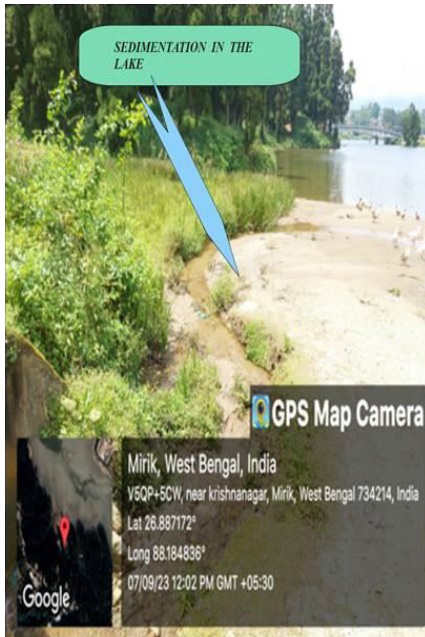


Figure 4.25: Sedimentation in the lake

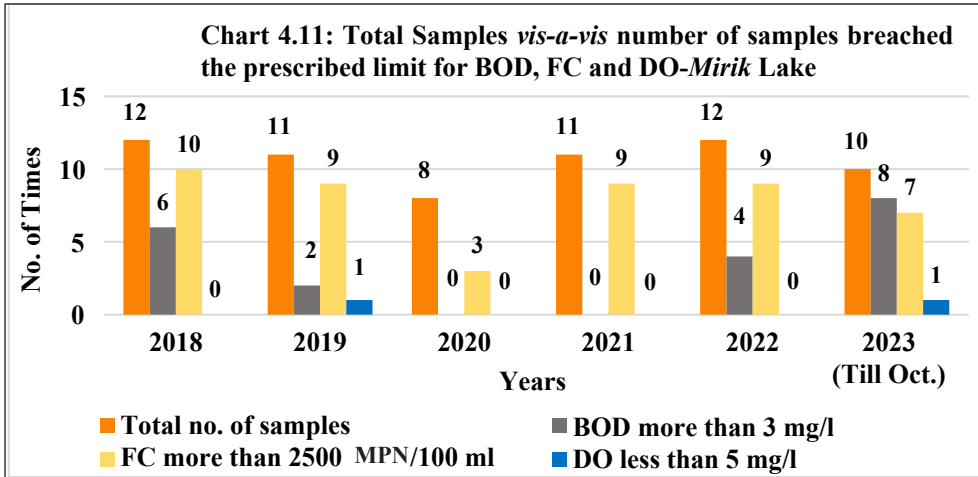
Thus, three sewage treatment facilities created at an expenditure of ₹ 36.30 crore could not be used even after four years of their completion and the pollution in the lake continued unabated.

In reply, the Department stated (March 2024) that UD&MA Department has initiated measures for making the STPs functional.

4.9.1 Impact on water quality of Mirik Lake (Darjeeling)

Audit observed that during 2018-23, BOD exceeded the prescribed limit in the years 2018, 2019, 2022 and 2023 while FC breached the limit in all the five years and DO did not meet the prescribed standards in 2019 and 2023.

The number of times BOD breached the prescribed limit ranged between zero to 80 per cent of the total times tests were conducted by WBPCB, while FC exceeded the range between 20 to 83 per cent times. It was further noted that DO did not meet the prescribed standards in zero to 10 per cent cases as shown in the **Chart 4.11**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.10 Santragachi lake (Howrah)

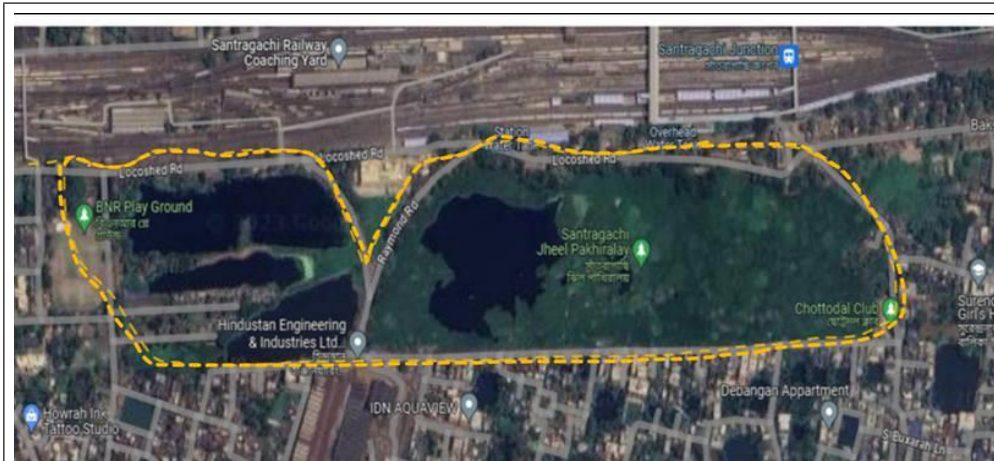


Figure 4.26: Santragachi lake

Santragachi Lake is located next to the *Santragachi Railway Station, Howrah*. The lake attracts a large number of migratory birds in winter, particularly in December and January. Observing damage to the lake due to discharge of untreated sewage and other waste from Howrah Municipal Corporation (HMC) area, in January 2016, a case was filed before the National Green Tribunal (NGT), Special Bench to prevent further damage to the lake.

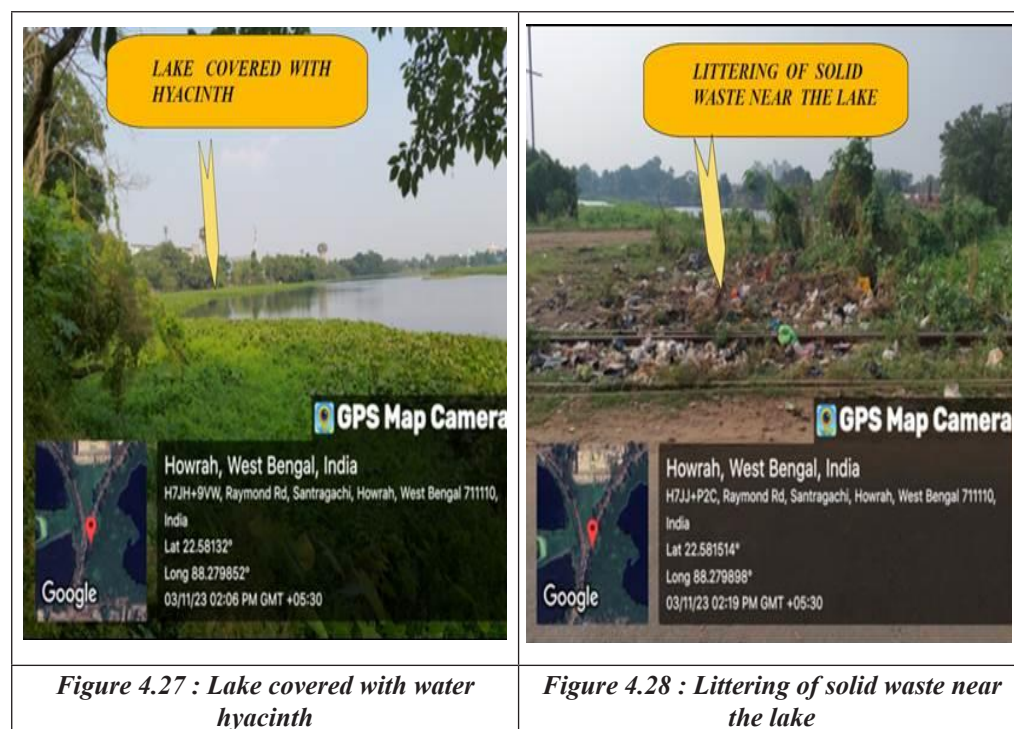
The tribunal issued (January 2016) notices to the HMC and the Forest Department to take remedial actions such as sealing of the outlets creating pollution and acting against illegal construction. The WBPCB was also directed by NGT to furnish a status report about the compliance with environmental norms. Subsequently, the Tribunal ordered the following in June 2020:

- a) The Railway Ministry was to provide land to KMDA for setting up of the STP for treatment of *Santragachi Lake* water.
- b) The cost of the project would be shared between HMC and the Railways in the ratio of contribution of sewage and,
- c) Encroachments from the Lake would be removed.

In September 2021, the Tribunal reviewed the progress and constituted a Committee to examine the Detailed Project Report (DPR) of ₹ 28.82 crore prepared by the KMDA for remedial measures to be taken to prevent pollution to *Santragachi Lake*.

Based on the DPR, audit observed that KMDA was assigned the work of construction of a garland drain around all sides of the Lake including interception and diversion of all outfalls to convey untreated effluents into the STP. KMDA proposed setting up of a low-cost sanitation treatment process by providing a Waste Stabilisation Pond (WSP), STP and two pumping stations.

Joint inspection of the Lake along with officials of WBPCB in November 2023 revealed that a major part of the Lake was covered with hyacinth. The work of the STP along with the garland drain had not yet commenced, though the NGT's stipulated period expired in November 2022. Further, residential units and shops were abutting the lake leading to direct discharge of waste into the lake.



Records also revealed that the land for setting up of the STP was not allocated by Indian Railways as of October 2023. The water quality analysis, carried out by WBPCB, in March 2023, revealed high levels of BOD (15 mg/l), high concentration of Total Coliforms (TC) (24,000 MPN/100 ml) and low levels of DO at 3.2 mg/l.

Thus, remedial measures for revival of the lake could not commence even after seven years since the matter first came before NGT in 2016, and the discharge of untreated sewage continued into the lake.

In reply, the Department stated (March 2024) that the Administrative Approval for the project from the UD&MA Department was awaited.

Recommendations 7:

UD&MA Department should complete the projects related to connections of household sewage with STPs and tapping of drains not connected with STPs on priority basis.