

**Revised Action Plan  
for  
Rejuvenation of River Damodar  
Paschim Bardhaman, West Bengal**

**Priority – IV**

**Nodal Agency  
Asansol Durgapur Development Authority  
Department of Urban Development & Municipal Affairs  
Government of West Bengal**

**Approved by  
River Rejuvenation Committee, West Bengal  
*(constituted in compliance to the order of the Hon'ble National Green Tribunal)***

**Submitted to  
Central Pollution Control Board, Delhi**

**JULY, 2020**

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## Executive Summary

| Sl. | Description of Item  | Details   |               |                |  |
|-----|--|---|---------------|----------------|--|
| 1.  | Name of the identified polluted river  | River Damodar   |               |                |  |
| 2.  | Identified polluted stretch of the river   | Disherghar to Durgachakam.<br><br>Disherghar to Durgapur is presently under consideration by ADDA   |               |                |  |
| 3.  | Total length of the polluted river   | 200 k.m. (approx.)<br>Disherghar to Durgapur presently under consideration by ADDA is approx. 80 KM |               |                |  |
| 4.  | Towns in the catchment of the polluted stretch of the river  | Kulti (Part), Asansol, Burnpur, Raniganj, Andal, Durgapur (part)                                    |               |                |  |
| 5.  | Is river perennial?  | Non perennial   |               |                |  |
| 6.  | No. of drains contributing to pollution and names of major drains  | Eleven (11)   |               |                |  |
|     | Drain discharging to river Damodar   | BOD (mg/L)  | FC(MPN/100mL) | TC (MPN/100mL) |  |
|     | i) Dihika canal discharging to river Damodar (Asansol, Burnpur)  | 3.70  | 3400          | 4700           |  |
|     | ii) Tamla canal discharging to river Damodar (Durgapur)  | 4.43  | 2000          | 2400           |  |
|     | iii) Singaranriver discharging to river Damodar (Andal G.P.)   | 5.89  | 1300          | 2400           |  |
|     | iv) Dhenua Canal discharging into the river Damodar (Asansol)  | 3.73  | 3200          | 4000           |  |
|     | v) Nunia Canal near Ghagarburi discharging into the river Damodar (Raniganj G.P.)  | 3.95  | 3400          | 4700           |  |
|     | vi) NupurNallah at Madanpur discharging into the river Damodar (Asansol)   | 5.01  | 2600          | 3900           |  |
|     | vii) Nunia Canal at Narayankuri village discharging into the river Damodar (Asansol)   | 7.99  | 2700          | 4100           |  |
|     | viii) DishergharNallah (near ChinnamastaMandir) discharging into the river Damodar (Asansol, Kulti)                                    | 4.32  | 4000          | 4800           |  |
|     | ix) DishergharNallah (Nadighat) discharging into the river Damodar (Asansol, Kulti)  | 3.71  | 3900          | 4700           |  |
|     | x) Chinakuri (near Power Station) discharging into the river Damodar (Asansol, Kulti)  | 4.30  | 2400          | 3900           |  |
|     | xi) Chinakuri (near pumping Station) discharging into the river Damodar (Asansol, Kulti)   | 5.06  | 3300          | 4600           |  |
| 7.  | Whether 'River Rejuvenation Committee' (RRC) constituted by the State Govt./UT Administration and If so, Date of constitution of 'RRC' | Yes.<br>07.01.2019  |               |                |  |
| 8.  | Major Towns on the banks of the river with population  | Population contributing sewage to the river Damodar as per 2011 census.                             |               |                |  |
|     | a) Population contributing sewage to the river Damoda=>  |   |               |                |  |
|     | (i) 2011 (Census)  | 14,77,419   |               |                |  |
|     | (ii) 2020  | 17,00,808   |               |                |  |
|     | (iii) 2035 (STP Design Year)   | 20,73,121   |               |                |  |
|     | (iv) 2050 (Sewer Design Year)  | 24,45,435   |               |                |  |
|     | b) Per Capita Water Demand=> (i) 2020-2050   | 135 Lpcd  |               |                |  |
|     |  |   |               |                | 1. DMC (70%) : 3,96,562<br>2. Andal Block : 1,86,915<br>3. Raniganj Block : 1,06,441<br>4. AMC : 5,63,917<br>5. Raniganj Municipality : 1,29,441<br>6. Kulti Municipality(30%): 94,143<br><b>TOTAL : 14,77,419</b> |
| 9.  | Major industrial estates located with total no. of industries  |   |               |                |  |
|     | a. Total no. industries discharging wastewater directly/indirectly in to the river   | 30  |               |                |  |
|     | b. Total water consumption   | 307275.308 KLD  |               |                |  |

|     |    |   |   |
|-----|----|---|---|
|     | c. | Total industrial effluent generation  | 99843.26 KLD  |
|     | d. | No. of industries having captive ETPs and their treatment capacity  | No. of industries=30<br>Treatment capacity=99843.26 KLD   |
|     | e. | No. of CETP's and their treatment capacity  | NIL   |
|     | f. | Gap in industrial wastewater treatment  | NIL   |
|     | g. | Total HW generation in TPA in the catchment area  | All hazardous waste generating industries are disposing their hazardous wastes through one (1) Common Hazardous Waste Treatment, Storage and Disposal Facility operating at Haldia.   |
|     | h. | Existing HW Treatment and Disposal Facilities and total capacity with life span   |   |
| 10. | i) | Nos. of the drainage outfall canals discharging into the Damodar River<br>a) Within Kulti (Part), Asansol, Burnpur, Raniganjareas<br>b) Within Durgapur(part) and Andal areas   | 9<br>2  |
| 11. |    | Domestic flow as per drainage outfall .<br><ul style="list-style-type: none"> <li>• Present Flow (2020)</li> <li>• Capacity of Existing STP/ETP</li> <li>• Gap</li> <li>• Perspective flow (STP design period 2035)</li> <li>• Proposed (installed) capacity</li> </ul> | 184 MLD<br>13.82 MLD<br>170.18 MLD<br>224 MLD (appx.)<br>210 MLD  |
| 12. |    | Project Area  | 380.68sq.k.m.   |
| 13. |    | Scope of the works  | Appropriate technology to be adopted to achieve the bathing water quality as per the national standard. Accordingly selection of Consultant for preparation of DPR has been finalized and placed before NMCG for their approval. However, suitable interim measures shall be taken by Sept. 2020. |
| 14. |    | Existing STP maintained by the following organizations in Durgapur<br>i) DMC (1 MLD), ii) DSP (6 MLD), iii) DPL (5 MLD), iv) ABL (0.5 MLD), v) DVC (1.32 MLD),  | Total – 13.82 MLD   |
| 15. |    | Nodal Agency  | Asansol Durgapur Development Authority, 1 <sup>st</sup> Administrative Building, City Centre, Durgapur-713216, Dist. PaschimBardhaman, W.B.   |

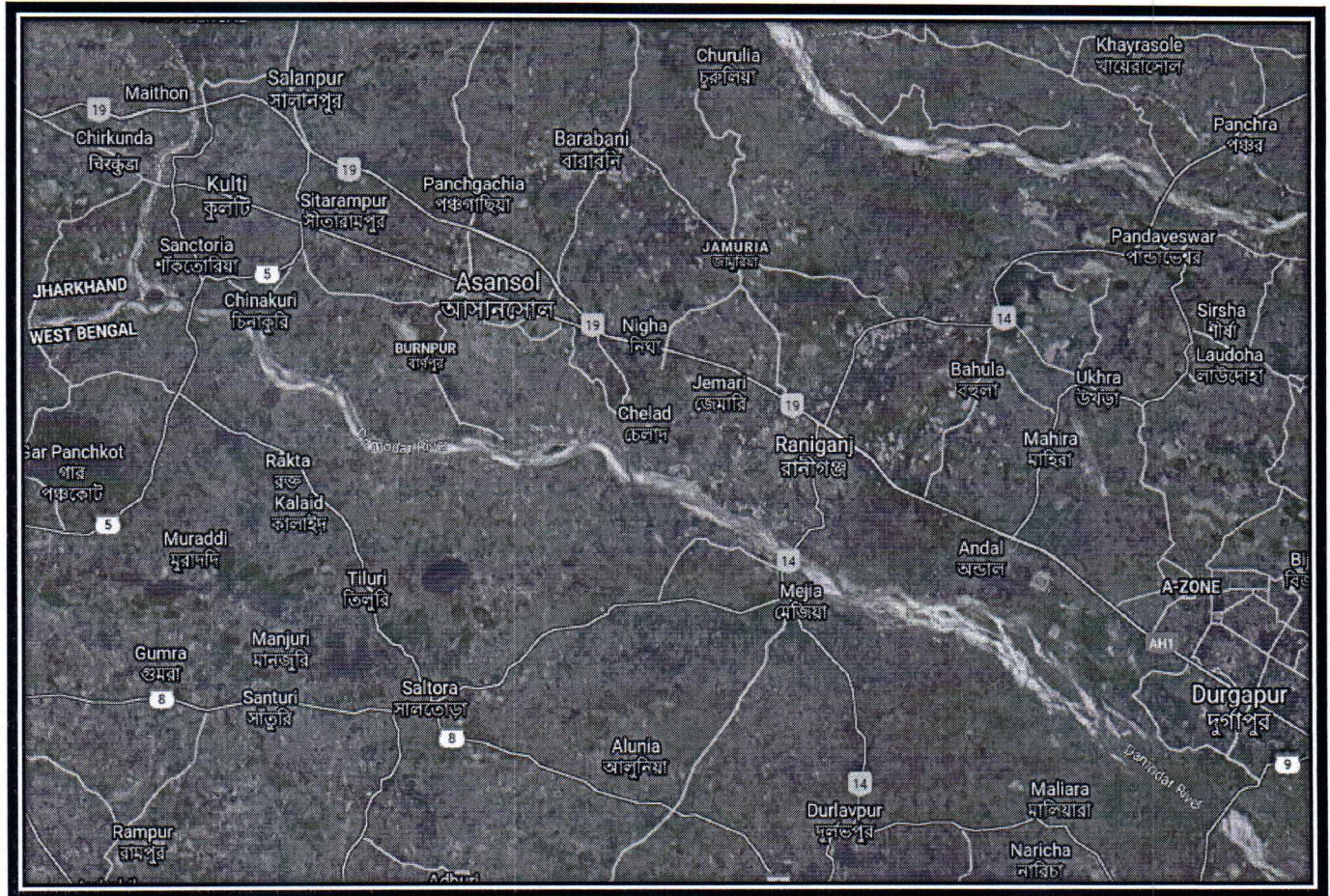
### Proposed Mechanism for execution of action plans:

This action plan implementation is to be monitored by the River Rejuvenation Committee (RRC) through meetings every month. The Central Monitoring Committee constituted by the Hon'ble NGT under the Chairmanship of the Secretary, Ministry of Jal Shakti, GoI also holds meeting in every month with the Chief Secretary/Principal Secretary, Environment of the State to assess progress of work. Every month Monthly Progress Report will be sent to Ministry of Jal Shakti, GoI.

An Environment Monitoring Cell in the Office of the Chief Secretary, WB has been constituted to oversee the progress of work.

## Expected deliverables with respect to achieving goals :

Considering the importance of this river in the Paschim Bardhaman district with respect to the livelihood of the fishermen living on both sides of the river, rejuvenation of water quality of this river is extremely important as it is non-perennial River. For achieving this objective, generated municipal sewage should be treated and discharged only when they comply with the prescribed standards. It has to be ensured that no industrial effluents are discharged without being properly treated and complying the discharged standards prescribed under the Environment (Protection) Rules, 1986. **The target for water quality for the stretch is to be fit at least for bathing purposes (i.e. BOD < 3 mg/l and FC < 500 MPN/100 ml).**



Google image of river Damodar from Dishergarh to Durgapur

**Response of the RRC, WB on comments of the  
Task Team for ensuring compliance to Hon'ble NGT (PB), New Delhi in OA No 673/2018  
held during 26.02.2020 and 11.06.2020**

| Comments of Task Team   | Corresponding response(s) of RRC_ West Bengal  |
|---|--|
| Latest water quality of PRS covering all parameters not provided  | Monthly water quality data for BOD & FC for the years 2017 and 2018 provided. Moreover, latest water quality of river Damodar covering all parameters also provided for the month of April 2020.   |
| Projected population not taken into account for assessment of sewage generation.  | Projected population till 2035 considered for assessment of sewage generation  |
| Detailed gap analysis (Town wise/ ULB wise) w.r.t. sewage, Industrial Effluent and Waste Management along with infrastructure available not included  | Available information included in the report.  |
| Aspects such as Utilization of treated waste water, Removal of encroachments not covered in action plan   | Department of Urban Development and Municipal Affairs, GoWB has prepared a policy on use of treated wastewater. The policy is in final stage of preparation. The same will be sent to CPCB for approval.   |
| Timelines for construction of STPs is exceeding March, 2021   | Primary treatment of wastewater in the nine drains in Kulti (part), Asansol, Burnpur, Raniganj and two drains in Andal and Durgapur (part) by providing screens, sedimentation tank, aeration, if necessary followed by disinfection by chlorination/hypochlorite is proposed. The work will be completed by 31.05.2022. |
| Action plan to be revised adding latest water quality data for the polluted river, major drains with flow and other parameters.   | Available information included in the report.  |
| Map showing all the towns, tributaries, drains & industrial estates, contributing to pollution to be included   | Available information included in the report.  |
| Gap analysis with projection up-to 15 years w.r.t sewage and Waste Management be included in action plan  | 210 MLD  |
| Action to be initiated against industries functioning without captive ETPs or connection with CETPs.  | All GPIs and SPIs under consent administration of WBPCB are having captive ETPs.   |
| Detailed gap analysis w.r.t present generation, projected generation existing infrastructure, existing capacity utilization, gap observed in the catchment for management of industrial effluent and waste management (solid waste, hazardous waste, C & D waste, bio-medical waste) need to be detailed in a separate table clearly. | Available information included in the report.  |

## Background:

The West Bengal is the land of rivers. An intricate network of three major river basins (the Ganga, Brahmaputra and Subarnarekha) drains this State. Human settlement and related activities on the banks of the rivers have gradually increased over the years. Considering very rich ecological diversities of the water resources and the benefits of river network, most of the industrial development in this State took place near the rivers and the population density is also very high in these areas. As a result, these rivers receive liquid wastes like industrial discharges and municipal sewage and solid wastes are also dumped near the banks of the rivers.

Since early eighties, the West Bengal Pollution Control Board (WBPCB), in collaboration with the Central Pollution Control Board (CPCB), initiated monitoring of water quality of all important rivers, canals, ponds and reservoirs. The CPCB conducted water quality assessment based on available data have collected till 2016 to identify polluted river stretches in the entire country.

An application was registered before the Hon'ble National Green Tribunal, Principal Bench, New Delhi as O.A. No. 673/2018 on the basis of a news item dated 17.09.2018 in "The Hindu" under the heading "More river stretches are now critically polluted: CPCB". The Hon'ble Tribunal was pleased to pass an order on 20.09.2018 identifying seventeen (17) polluted river stretches in the State of West Bengal and categorized these polluted stretches in five priority classes (Table-1). The Hon'ble Tribunal directed the State to prepare action plans for rejuvenation of these 17 polluted river stretches for bringing all the polluted river stretches to be fit at least for bathing purposes (i.e. BOD < 3 mg/l and FC < 500 MPN/100 ml). The Hon'ble NGT further directed on 19.12.2019 that action plans for rivers are to be reviewed by the CPCB before acceptance.

**Table 1: Polluted river stretches in West Bengal**

| Sl. No. | Priority | River        | Polluted Stretch identified           | BOD (mg/L) when identified as polluted |
|---------|----------|--------------|---------------------------------------|--|
| 1       | I        | Vindyadhari  | Haroa Bridge to Malancha Burning Ghat | 26.7 – 45.0                            |
| 2       | II       | Mahananda    | Siliguri to Binaguri                  | 6.5 – 25                               |
| 3       | III      | Churni       | Santipur Town to Majhadia             | 10.3 – 11.3                            |
| 4       | III      | Dwarka       | Tarapith to SadhakBamdebGhat          | 5.6 – 17.0                             |
| 5       | III      | Ganga        | Tribeni to Diamond Harbour            | 5.0 – 12.2                             |
| 6       | IV       | Damodar      | Durgachak to Dishergarh               | 4.4 – 8.2                              |
| 7       | IV       | Jalangi      | LaalDighi to Krishna Nagar            | 8.3                                    |
| 8       | IV       | Damodar      | Midnapore to Ramnagar                 | 9.9                                    |
| 9       | IV       | MathaBhanga  | Madhupur to Gobindapur                | 8.5                                    |
| 10      | V        | Barakar      | Kulti to Asansol                      | 5.7                                    |
| 11      | V        | Dwarakeshwar | Bankura to Kushtia                    | 1 – 5.6                                |
| 12      | V        | Kaljani      | Bitala to Alipurduar                  | 6.0                                    |
| 13      | V        | Karola       | Jalpaiguri to ThakurerKamat           | 3.9                                    |
| 14      | V        | Mayurakshi   | Suri to Durgapur                      | 5.2                                    |
| 15      | V        | Rupnarayan   | Kolaghat to Benapur                   | 3.1 – 5.8                              |
| 16      | V        | Silabati     | Ghatal to Nischindipur                | 3.8                                    |
| 17      | V        | Teesta       | Siliguri to Paharpur                  | 3.3                                    |

## **River Rejuvenation Committee:**

In compliance to the direction of Hon'ble National Green Tribunal, Principal Bench, New Delhi in respect of O.A. No. 673/2018, the Government of West Bengal constituted the River Rejuvenation Committee (RRC) for preparation of such action plans for effective abatement of pollution, rejuvenation, protection and management of the identified polluted River stretches, for bringing the polluted river stretches to be fit at least for bathing purposes and identified the following components for such action plan, although all the components may not be applicable for all the polluted river stretches:

1. Identification of polluting sources
2. Trade and sewage generated in the catchment area of polluted river stretch
3. Functioning status of STPs/ETPs/CETP
4. Interception and Diversion of sewage carrying drains to the STP
5. Solid waste management including quantification and characterisation of solid waste, Bio-medical waste management, e-waste and processing facilities, quantification and characterisation of solid waste
6. Protection and management of Flood Plain Zones (FPZ)
7. Rain water harvesting, ground water charging
8. Adopting good irrigation practices
9. Address issues relating to ground water extraction
10. Maintaining minimum environmental flow of river and plantation on both sides of the river
11. Plantation on both sides of the river
12. Setting up of biodiversity parks on flood plains by removing encroachment.
13. Utilization of treated sewage so as to minimize extraction of ground or surface water

The Member Secretary, West Bengal Pollution Control Board is the Chairman, RRC and the Chief Executive Officer, Kolkata Metropolitan Development Authority is the Member-Convenor, RRC. The Committee is functioning under the supervision and coordination of Principal Secretary, Environment Department, GoWB.

The main causes of the river water quality deterioration are (1) Discharge of industrial wastewater (2) Discharge of municipal wastewater and (3) Pollution from nonpoint sources. Any action plan for any river stretch to improve its water quality then is required to address these three issues and address them primarily. In West Bengal there are forty eight (48) Grossly Polluting Industries (GPIs) and four hundred (400) odd Seriously Polluting Industries (SPIs). All these industries are under Consent administration of the WBPCB. The WBPCB inspects the GPIs every month and SPIs periodically to assess the environmental performance of these industries. All these industries are having Effluent Treatment Plant(s) inside the premises and the industrial wastewater generated are treated in these ETPs before being discharged either in to the river / canal or to local water bodies (Ponds & Wetlands) or to municipal drains/public sewer those are channelized to the canals. The river stretches in the State run through habitations of wide varieties and human activities. The habitations on the banks of these rivers also generate large quantities of sewage water regularly which are also drained through various discharges channels in to these rivers. As the rivers are not of perennial nature, during lean periods the water volume becomes less resulting in high pollution concentrations. Inadequacy in solid waste management facilities resulted in unscientific dumping of solid wastes on the banks and this is also a major source of river pollution. Since most of these rivers are having long stretches, agricultural runoffs also finally find their ways in to these rivers. The river water quality database of the WBPCB however shows no significant impact of such non-point source contribution in any of these river stretches.

Therefore, the action plan for river Damodar needs to be prepared for its catchment areas considering the discharges from industrial source, discharges from municipal outfalls, interception and diversion of sewage carrying drains to the STP, solid waste management, Bio-medical waste management, e-waste management, ground water management, rain water harvesting, ground water charging, maintaining minimum environmental flow of river, protection and management of Flood Plain Zones (FPZ), adopting good irrigation practices, plantation on both sides of the river, setting up of biodiversity parks on flood plains etc.



## **Damodar River System**

The river Barakar originated from the reservoir Maithon of the Chotanagpur region and joined the river Damodar at Dishergarh after it came out of the Panchet Dam. These two rivers run by the towns Kulti (Part), Asansol, Burnpur, Raniganj, Andal and Durgapur (Part) and drains into the river Ganga after passing through the rural areas of Udaynarayanpur and Bagnan. These two river systems are being considered together as the problem area for these two stretches belong to the same local authority, i.e., the Asansol Municipal Corporation, Durgapur Municipal Corporation and the Asansol Durgapur Development Authority and this stretch belongs to the district authority of Paschim Bardhaman. Both the rivers are non-tidal in the concerned stretch and tidal in the stretch of Udaynarayanpur and Bagnan. This Udaynarayanpur and Bagnan stretch does not receive wastewater from the city area of Asansol Durgapur and is at a distance of more than 100 km from the Durgapur area which is the last city to discharge untreated wastewater to Damodar. Flow in the river receives enormous amount of discharge of municipal sewage round the year. BOD and Bacteriological count (Faecal Coliform) are the principal pollutants in this river stretch. The principal sources for this river are presented below.

### **Polluting sources of Damodar River**

1. Dihika canal discharging to river Damodar (Asansol, Burnpur)
2. Tamla canal discharging to river Damodar (Durgapur)
3. Singaranriver discharging to river Damodar (Andal G.P.)
4. Dhenua Canal discharging into the river Damodar (Asansol)
5. Nunia Canal near Ghagarburi discharging into the river Damodar (Raniganj G.P.)
6. Nupur Nallah at Madanpur discharging into the river Damodar (Asansol)
7. Nunia Canal at Narayankuri village discharging into the river Damodar (Asansol)
8. DishergarhNallah (near Chinnamasta Mandir) discharging into the river Damodar (Asansol, Kulti)
9. Dishergarh Nallah (Nadighat) discharging into the river Damodar (Asansol, Kulti)
10. Chinakuri (near Power Station) discharging into the river Damodar (Asansol, Kulti)
11. Chinakuri (near pumping Station) discharging into the river Damodar (Asansol, Kulti)

Some minor outfall drains leading to Tamla Nallah which ultimately discharging into the River Damodar (Durgapur).

The water quality status of the river, as influenced by the discharges of the sources mentioned above is monitored on monthly basis at ten water quality monitoring stations spanning the entire stretch. On the basis of this data the stretch was identified as under priority III. During preparation of the current report, the water quality data of this stretch for last two years was analyzed using the latest "CRITERIA FOR PRIORITISATION OF POLLUTED RIVER LOCATION (DRAFT)" circulated by the Central Pollution Control Board (CPCB). Using data of last 24 determinations in two years (January 2017 to December 2018), the river stretch could be identified as Priority III (Moderately Polluted or Fair) with the last two years' average BOD data of 3.2 mg/L and Faecal Coliform value of 5362 MPN/100mL.

### **Water Quality and Goals and Status**

Considering the impact of this river water to the requirement of water intake point for industrial and domestic supply after treatment and the livelihood of the people living on both sides of the river, revival of the water quality of this river is extremely important on context of its utility as it is a non tidal River. The ultimate goal for beneficial use of rivers will determine the level of actions to be taken for maintaining the water quality. Under the present circumstances, it appears that river system serve the purpose of drinking water intake points (for supply after treatment) fishery, irrigation and, most importantly, the health of the sensitive gangetic ecosystems downstream. For achieving this objective, industrial wastewater discharge and generated municipal sewage

should be treated to meet the required standards for outdoor bathing. Also, the trade and other effluents generated within the catchment of river Damodar which are ultimately joining and contributing to the pollution load in the rivers should be treated to meet the effluent discharge standards stipulated under the general standards for discharge of environmental pollutants part-a: effluents of the Environment (Protection) Rules, 1986.

**The status of the Damodar river water quality for the years from 2017 to 2018 is presented below:**

| Month-year | Damodar at Dishergarh |                | Damodar at ISSCO |                |
|------------|-----------------------|----------------|------------------|----------------|
|            | BOD (mg/L)            | FC (MPN/100mL) | BOD (mg/L)       | FC (MPN/100mL) |
| Jan-17     | 2.5                   | 8000           | 2.7              | 1400           |
| Feb-17     | 2.5                   | 3300           | 2.9              | 1700           |
| Mar-17     | 2.3                   | 2200           | 3.5              | 2100           |
| Apr-17     | 2.35                  | 2700           | 2.7              | 3000           |
| May-17     | 6.35                  | 3300           | 3.05             | 3400           |
| Jun-17     | 4.3                   | 6000           | 2.95             | 5000           |
| Jul-17     | 1.25                  | 3400           | 2.1              | 2600           |
| Aug-17     | 5.1                   | 2600           | 3.2              | 3000           |
| Sep-17     | 1.75                  | 3300           | 2.6              | 2600           |
| Oct-17     | 2.35                  | 3400           | 4.45             | 2200           |
| Nov-17     | 5.2                   | 2200           | 2.95             | 2100           |
| Dec-17     | 4.9                   | 3300           | 5.7              | 2100           |
| Jan-18     | 3.8                   | 2700           | 3.9              | 1700           |
| Feb-18     | 3.6                   | 3300           | 3.6              | 2600           |
| Mar-18     | 3.15                  | 3000           | 3.35             | 2700           |
| Apr-18     | 2.85                  | 2600           | 3.25             | 24000          |
| May-18     | 2.8                   | 2700           | 3.1              | 3300           |
| Jun-18     | 1.25                  | 3300           | 2.2              | 2600           |
| Jul-18     | 2.9                   | 17000          | 1.95             | 11000          |
| Aug-18     | 2.8                   | 11000          | 2.5              | 22000          |
| Sep-18     | 2.65                  | 9000           | 2.45             | 5000           |
| Oct-18     | 2.2                   | 14000          | 2.1              | 7000           |
| Nov-18     | 2.1                   | 7000           | 2.3              | 8000           |
| Dec-18     | 2.95                  | 2100           | 1.85             | 6000           |

| Month<br>- year | Damodar at Narayanpur |                   | Damodar at MajherMana<br>Village |                   | Damodar at Andal<br>(Upstream) |                   |
|-----------------|-----------------------|-------------------|----------------------------------|-------------------|--------------------------------|-------------------|
|                 | BOD<br>(mg/L)         | FC<br>(MPN/100mL) | BOD<br>(mg/L)                    | FC<br>(MPN/100mL) | BOD<br>(mg/L)                  | FC<br>(MPN/100mL) |
| Jan-17          | 2.15                  | 2600              | 2.5                              | 8000              | 2.7                            | 1400              |
| Feb-17          | 2.8                   | 3400              | 2.5                              | 3300              | 2.9                            | 1700              |
| Mar-17          | 5.35                  | 5000              | 2.3                              | 2200              | 3.5                            | 2100              |
| Apr-17          | 2.15                  | 3400              | 2.35                             | 2700              | 2.7                            | 3000              |
| May-17          | 1.75                  | 4000              | 6.35                             | 3300              | 3.05                           | 3400              |
| Jun-17          | 2.5                   | 5000              | 4.3                              | 6000              | 2.95                           | 5000              |
| Jul-17          | 1.35                  | 5000              | 1.25                             | 3400              | 2.1                            | 2600              |
| Aug-17          | 2.5                   | 2200              | 5.1                              | 2600              | 3.2                            | 3000              |
| Sep-17          | 3.4                   | 5000              | 1.75                             | 3300              | 2.6                            | 2600              |
| Oct-17          | 4.95                  | 3400              | 2.35                             | 3400              | 4.45                           | 2200              |
| Nov-17          | 2.1                   | 2700              | 5.2                              | 2200              | 2.95                           | 2100              |
| Dec-17          | 4.25                  | 3300              | 4.9                              | 3300              | 5.7                            | 2100              |
| Jan-18          | 2.25                  | 2300              | 3.8                              | 2700              | 3.9                            | 1700              |
| Feb-18          | 2.9                   | 3000              | 3.6                              | 3300              | 3.6                            | 2600              |
| Mar-18          | 2.95                  | 4000              | 3.15                             | 3000              | 3.35                           | 2700              |
| Apr-18          | 2.9                   | 1100              | 2.85                             | 2600              | 3.25                           | 24000             |
| May-18          | 2.8                   | 14000             | 2.8                              | 2700              | 3.1                            | 3300              |
| Jun-18          | 2.9                   | 6000              | 1.25                             | 3300              | 2.2                            | 2600              |
| Jul-18          | 2.9                   | 14000             | 2.9                              | 17000             | 1.95                           | 11000             |
| Aug-18          | 2.7                   | 11000             | 2.8                              | 11000             | 2.5                            | 22000             |
| Sep-18          | 2.9                   | 9000              | 2.65                             | 9000              | 2.45                           | 5000              |
| Oct-18          | 3.1                   | 8000              | 2.2                              | 14000             | 2.1                            | 7000              |
| Nov-18          | 2.75                  | 9000              | 2.1                              | 7000              | 2.3                            | 8000              |
| Dec-18          | 2.65                  | 7000              | 2.95                             | 2100              | 1.85                           | 6000              |

| Month - year | Damodar at Andal (Downstream) |                | Damodar at Asansol |                |
|--------------|-------------------------------|----------------|--------------------|----------------|
|              | BOD (mg/L)                    | FC (MPN/100mL) | BOD (mg/L)         | FC (MPN/100mL) |
| Jan-17       | 2.15                          | 2600           | 2.5                | 8000           |
| Feb-17       | 2.8                           | 3400           | 2.5                | 3300           |
| Mar-17       | 5.35                          | 5000           | 2.3                | 2200           |
| Apr-17       | 2.15                          | 3400           | 2.35               | 2700           |
| May-17       | 1.75                          | 4000           | 6.35               | 3300           |
| Jun-17       | 2.5                           | 5000           | 4.3                | 6000           |
| Jul-17       | 1.35                          | 5000           | 1.25               | 3400           |
| Aug-17       | 2.5                           | 2200           | 5.1                | 2600           |
| Sep-17       | 3.4                           | 5000           | 1.75               | 3300           |
| Oct-17       | 4.95                          | 3400           | 2.35               | 3400           |
| Nov-17       | 2.1                           | 2700           | 5.2                | 2200           |
| Dec-17       | 4.25                          | 3300           | 4.9                | 3300           |
| Jan-18       | 2.25                          | 2300           | 3.8                | 2700           |
| Feb-18       | 2.9                           | 3000           | 3.6                | 3300           |
| Mar-18       | 2.95                          | 4000           | 3.15               | 3000           |
| Apr-18       | 2.9                           | 1100           | 2.85               | 2600           |
| May-18       | 2.8                           | 14000          | 2.8                | 2700           |
| Jun-18       | 2.9                           | 6000           | 1.25               | 3300           |
| Jul-18       | 2.9                           | 14000          | 2.9                | 17000          |
| Aug-18       | 2.7                           | 11000          | 2.8                | 11000          |
| Sep-18       | 2.9                           | 9000           | 2.65               | 9000           |
| Oct-18       | 3.1                           | 8000           | 2.2                | 14000          |
| Nov-18       | 2.75                          | 9000           | 2.1                | 7000           |
| Dec-18       | 2.65                          | 7000           | 2.95               | 2100           |

| Month - year | Damodar at Durgapur |                | Damodar at Ranigunj |                |
|--------------|---------------------|----------------|---------------------|----------------|
|              | BOD (mg/L)          | FC (MPN/100mL) | BOD (mg/L)          | FC (MPN/100mL) |
| Jan-17       | 2.15                | 2600           | 2.5                 | 8000           |
| Feb-17       | 2.8                 | 3400           | 2.5                 | 3300           |
| Mar-17       | 5.35                | 5000           | 2.3                 | 2200           |
| Apr-17       | 2.15                | 3400           | 2.35                | 2700           |
| May-17       | 1.75                | 4000           | 6.35                | 3300           |
| Jun-17       | 2.5                 | 5000           | 4.3                 | 6000           |
| Jul-17       | 1.35                | 5000           | 1.25                | 3400           |
| Aug-17       | 2.5                 | 2200           | 5.1                 | 2600           |
| Sep-17       | 3.4                 | 5000           | 1.75                | 3300           |
| Oct-17       | 4.95                | 3400           | 2.35                | 3400           |
| Nov-17       | 2.1                 | 2700           | 5.2                 | 2200           |
| Dec-17       | 4.25                | 3300           | 4.9                 | 3300           |
| Jan-18       | 2.25                | 2300           | 3.8                 | 2700           |
| Feb-18       | 2.9                 | 3000           | 3.6                 | 3300           |
| Mar-18       | 2.95                | 4000           | 3.15                | 3000           |
| Apr-18       | 2.9                 | 1100           | 2.85                | 2600           |
| May-18       | 2.8                 | 14000          | 2.8                 | 2700           |
| Jun-18       | 2.9                 | 6000           | 1.25                | 3300           |
| Jul-18       | 2.9                 | 14000          | 2.9                 | 17000          |
| Aug-18       | 2.7                 | 11000          | 2.8                 | 11000          |
| Sep-18       | 2.9                 | 9000           | 2.65                | 9000           |
| Oct-18       | 3.1                 | 8000           | 2.2                 | 14000          |
| Nov-18       | 2.75                | 9000           | 2.1                 | 7000           |
| Dec-18       | 2.65                | 7000           | 2.95                | 2100           |

|   |      |
|---|------|
| Average BOD for last two years (mg/L)     | 3.2  |
| Average TC for last two years (MPN/100mL) | 5362 |

**Present Status of the quality of the water of the River Damodar as per WBPCB Report:**

| April 2020                                 | River Damodar      |              |           |                 |           |
|--|--------------------|--------------|-----------|-----------------|-----------|
|  | Dishergarh Village | D/S of IISCO | Narainpur | Near MujherMana | Andal D/S |
| Ammonia-N (mg/L)                           | 0.243              | 0.192        | 0.184     | 0.216           | 0.172     |
| BOD (mg/L)                                 | 2.55               | 1.40         | 2.60      | 2.85            | 2.20      |
| Calcium (mg/L)                             | 29.79              | 27.83        | 32.14     | 29.00           | 30.58     |
| Chloride (mg/L)                            | 11.66              | 10.66        | 19.26     | 32.44           | 10.14     |
| COD (mg/L)                                 | 12.96              | 10.80        | 9.72      | 18.36           | 11.88     |
| Conductivity(us/cm)                        | 219.30             | 224.00       | 336.10    | 355.00          | 242.10    |
| Dissolved O <sub>2</sub> (DO) (mg/L)       | 7.80               | 8.20         | 9.00      | 7.90            | 7.20      |
| Fecal Coliform (MPN/100ml)                 | 4700               | 3300         | 2100      | 4700            | 2200      |
| Magnesium (mg/L)                           | 9.05               | 8.33         | 15.72     | 13.81           | 10.00     |
| Nitrate-N (mg/L)                           | 0.6540             | 0.3259       | 0.4677    | 0.4045          | 0.1741    |
| pH   | 8.11               | 8.03         | 8.07      | 7.96            | 7.93      |
| Phosphate-P (mg/L)                         | 0.1117             | 0.0439       | 0.0577    | 0.0951          | 0.0976    |
| Potassium (mg/L)                           | 3.10               | 2.70         | 5.10      | 3.40            | 2.80      |
| Sodium (mg/L)                              | 14.90              | 15.80        | 15.40     | 16.80           | 15.90     |
| Sulphate (mg/L)                            | 27.1437            | 12.7112      | 35.3917   | 30.6022         | 29.2513   |
| Total Alkalinity (mg/L)                    | 76.00              | 64.00        | 102.00    | 104.00          | 116.00    |
| Total Coliform (MPN/100ml)                 | 7000               | 4800         | 3200      | 7000            | 2700      |
| Total Dissolved Solids(TDS) (mg/L)         | 134.00             | 140.00       | 234.00    | 218.00          | 220.00    |
| Total Hardness as CaCo <sub>3</sub> (mg/L) | 111.72             | 103.88       | 145.04    | 129.36          | 117.60    |
| Turbidity (NTU)                            | 21.40              | 18.12        | 19.41     | 19.28           | 19.20     |

**Present Status of the quality of the water of the River Damodar as per WBPCB Report:**

| April 2020                                 | River Damodar |             |              |              |              |
|--|---------------|-------------|--------------|--------------|--------------|
|  | Andal U/S     | Asansol U/S | Durgapur U/S | Raniganj D/S | Burdwan Town |
| Ammonia-N (mg/L)                           | 0.188         | 0.213       | 0.187        | 0.166        | 0.154        |
| BOD (mg/L)                                 | 2.80          | 2.55        | 2.40         | 2.75         | 2.65         |
| Calcium (mg/L)                             | 34.50         | 21.17       | 25.87        | 24.30        | 27.44        |
| Chloride (mg/L)                            | 15.21         | 22.31       | 18.25        | 32.44        | 11.66        |
| COD (mg/L)                                 | 14.04         | 10.80       | 9.72         | 12.96        | 9.72         |
| Conductivity(us/cm)                        | 337.60        | 232.00      | 322.50       | 357.40       | 367.30       |
| Dissolved O <sub>2</sub> (DO) (mg/L)       | 7.30          | 8.40        | 7.80         | 7.90         | 8.50         |
| Fecal Coliform (MPN/100ml)                 | 2600          | 3200        | 2600         | 4300         | 2100         |
| Magnesium (mg/L)                           | 13.81         | 10.00       | 11.91        | 13.34        | 9.53         |
| Nitrate-N (mg/L)                           | 0.4870        | 0.1910      | 0.1740       | 0.1355       | 0.6540       |
| pH   | 7.97          | 7.86        | 7.94         | 7.99         | 8.07         |
| Phosphate-P (mg/L)                         | 0.0713        | 0.0854      | 0.1783       | 0.1455       | 0.1117       |
| Potassium (mg/L)                           | 2.10          | 4.00        | 4.60         | 4.80         | 3.70         |
| Sodium (mg/L)                              | 15.60         | 14.70       | 15.80        | 16.40        | 16.50        |
| Sulphate (mg/L)                            | 33.4236       | 21.7102     | 25.4607      | 28.7192      | 27.1437      |
| Total Alkalinity (mg/L)                    | 106.00        | 90.00       | 108.00       | 114.00       | 96.00        |
| Total Coliform (MPN/100ml)                 | 3300          | 4700        | 4000         | 7000         | 4000         |
| Total Dissolved Solids(TDS) (mg/L)         | 224.00        | 134.00      | 238.00       | 264.00       | 218.00       |
| Total Hardness as CaCo <sub>3</sub> (mg/L) | 143.08        | 94.08       | 113.68       | 115.64       | 107.80       |
| Turbidity (NTU)                            | 15.59         | 23.14       | 20.66        | 18.22        | 18.46        |

**Ecological/Environmental Flow (E-Flow)**

The river Damodar has freshwater up-stream flow from the reservoirs Panchet. This river receives huge runoff during monsoon and base flow is maintained primarily from the reservoir discharge. Afforestation, rainwater harvesting and reduction of ground water exploitation from flood plain of these rivers can be tried, but lean season discharge from the reservoirs is the key for maintenance of ecological flow for this river. Discharge of industrial and urban wastewater after appropriate treatment meeting the stipulated discharge standard for respective industries and STPs of the urban cities like Disherghar, Asansol, Kulti, Durgapur, Raniganj etc. At the four locations, i.e., upstream and downstream of river for the considered stretch, flow of the river should be measured and record maintained by State Irrigation department.

**Table-6: Action Plan with agencies responsible, time target and budgetary estimates**

| Departments /Agencies          | Actions to be taken   |  | Targeted timeline           | Budgetary Estimate (Rs. In lakh)            |  |
|--------------------------------|---|--|-----------------------------|---|--|
| Asansol Municipal Corporation  | 1. Action plans for management of municipal wastewater discharge for Damodar.   |  | 31 <sup>st</sup> May, 2022. | NA  |  |
|                                | 2. Action plan for solid waste management.<br>3. Action plan for development of greeneries.<br>4. Action plans for Ground water re-charging /rain water harvesting.<br>5. Action plan for management of plastic waste, Hazardous, Bio-medical and Electrical and Electronic wastes.   |  | June, 2020 to July, 2022    | NA  |  |
| Durgapur Municipal Corporation | 1. Action plans for management of municipal wastewater discharge for Damodar.   |  | 31 <sup>st</sup> May, 2022. | NA  |  |
|                                | 2. Action plan for solid waste management.<br>3. Action plan for development of greeneries.<br>4. Action plans for Ground water re-charging/rain water harvesting.<br>5. Action plan for management of plastic waste, Hazardous, Bio-medicaland Electrical and Electronic wastes.   |  | June, 2020 to July, 2022    | NA  |  |
| WBPCB                          | All industries are having treatment facilities in place and are being monitored on regular basis.   |  | Continuous process          | -   |  |
| SUDA                           | Action plans for management of Municipal, Plastic, Hazardous, Bio-medical and Electrical and Electronic wastes the following rivers and towns.<br>Detailed gap analysis w.r.t town-wise water consumption(Including ground water consumption), sewage generation, existing infrastructure in the catchment area and the gap analysis.   |  | June,2020 to July, 2022     | NA  |  |
| MSME (Department of IT)        | Quantification and Characterization   | Installation of e-waste bin, Categorizing and Disposal                 | 28.02.2021                  | 12.6  |  |
|                                | Existing Infrastructure   | Selection and Utilization of approved PROs for collection and Disposal |                             |   |  |
|                                | Detailed Gap Analysis   | Quantification and Characterization                                    |                             |   |  |
|                                | Management Action Plan  | Meeting with OEMs, other stake holders                                 |                             |   |  |
|                                | Promotional   | Sensitization Training   |                             |   |  |
|                                |   | Promotional Documents, Training Materials                              |                             |   |  |
| Irrigation Department          | Protection and management of flood plain zones (FPZ) -<br>At present there is no requirement of taking up any anti-erosion work in this reach.<br>In order to facilitate improved irrigation system, flood control management, minimised drainage congestion, the Irrigation & Waterways Department has taken up a major project "West Bengal Major Irrigation & Flood Management Project (WBMIFMP)" with a cost of Rs. 2768 crore, for betterment of 26.80 lakh people in Howrah, Hooghly and Bardhaman districts. Bank protection of all vulnerable spots under this stretches will be covered under the above mentioned West Bengal Major Irrigation & Flood Management Project (WBMIFMP). |  | 2025                        | Financial assistance of World Bank and AIIB |  |



|                        |  |  |   |
|------------------------|--|--|---|
|                        | <b>Maintaining minimum environmental flow of river –</b><br>There is no regulating structure in West Bengal. However there is a dam in Panchet over Damodar river, which regulates the flow through this river. This release from the Dam, along with the contribution from the uncontrolled catchment of the d/s of the dam, maintains environmental flow in the river. |  |   |
| Department of Forest   | Nursery work completed. Plantation work will start from July 2020.   | 30.09.2020                                       | 27.80   |
| Agriculture Department | 1. Watershed Development in total 219 ha of land.<br>2. Good agricultural practice (reclamation, re-excavation, irrigation, channel, water harvesting, dug well etc.).   | 2019-2020<br>2020-2021<br>2021-2022<br>(3 Years) | 190.584   |
| P&RDD                  | <ul style="list-style-type: none"> <li>• Rainwater harvesting in primary school</li> <li>• Plantation in catchment area</li> <li>• Setting up of Bio-diversity park</li> <li>• SWM Units</li> <li>• Watershed management programmes, IHHL activities etc.</li> </ul>   | 30.06.2021                                       | 1094.61   |
| SWID                   | <ul style="list-style-type: none"> <li>• Groundwater recharging</li> <li>• GW Level &amp; Quality Monitoring</li> <li>• Real-Time GWL Monitoring through Installation of DWLR</li> <li>• Roof top rainwater and surface runoff harvesting for conservation on surface and artificial recharge to groundwater.</li> </ul>   | 31.01.2021                                       | Not readily available   |
| DoUD&MA                | Utilization of treated waste water   |  | Policy has been notified by Govt. of West Bengal on 30-06-2020. Action will be taken accordingly. |

NA: Not Readily Available

**Action taken report for compliance to observations made on 13th meeting of the Task Team held on 10/07/2020**

| Name of State  | Direction of the Task Team held on 10.07.2020  | Action taken for Compliance   |
|--|--|---|
| West Bengal  | <ul style="list-style-type: none"> <li>Water quality of the polluted river stretches for Faecal Streptococci (FSC) whereas water quality of all drains to be analyzed for general parameters, heavy metals and Faecal coliform as well as Faecal Streptococci (FSC) and included in the report.</li> </ul>                 | <ul style="list-style-type: none"> <li>Directions given will be complied with and will be submitted subsequently.</li> </ul>                    |
|  | <ul style="list-style-type: none"> <li>Water quality of ground water in the catchment for relevant parameters to be included.</li> </ul>   | <ul style="list-style-type: none"> <li>Status on the quality of ground water has been submitted by the SWID vide <b>annexure-II</b>.</li> </ul> |
|  | <ul style="list-style-type: none"> <li>Bio-mining of existing dumpsites in the catchment of polluted river stretches need to be elaborated.</li> </ul>   | <ul style="list-style-type: none"> <li>Dumpsites have been identified by SUDA and action for Bio-mining is in process.</li> </ul>               |
|  | <ul style="list-style-type: none"> <li>I &amp; D of sewage from the identified drain to the nearby existing STPs or proposed STPs to be mentioned clearly in the report.</li> </ul>  | <ul style="list-style-type: none"> <li>DPR for STP for rejuvenation of the River Damodar is under process.</li> </ul>                           |
|  | <ul style="list-style-type: none"> <li>Watershed management, flood plain protection, ground water recharge, greenery, rain water harvesting apart from measures for discharge of stored water from U/s of dams to be included as a part of proposal for e-flow maintenance in all the polluted river stretches.</li> </ul> | <ul style="list-style-type: none"> <li>This issue will be addressed by the department of Irrigation &amp; Waterways, GoWB.</li> </ul>           |
|  | <ul style="list-style-type: none"> <li>Specific funding agency for each action point to be included.</li> </ul>  | <ul style="list-style-type: none"> <li>NMCG &amp; Govt. of West Bengal.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Short-term measures for drains such as phytoremediation/bio-remediation/nano bubbles treatment/aeration treatment and other options feasibility to be examined and adopted to improve water quality of polluted rivers depending on the local conditions.</li> </ul>                | <ul style="list-style-type: none"> <li>An interim short term measure has been undertaken and is in progress.</li> </ul>                         |
| <ul style="list-style-type: none"> <li>Timelines to be revised as per Hon'ble NGT orders for all the proposed action plans and PERT chart also be included.</li> </ul> | <ul style="list-style-type: none"> <li>PERT chart has already been submitted vide <b>annexure-I</b>.</li> </ul>  |   |

SUDA: State Urban Development Agency, DoUD&MA, GoWB

WBPCB: West Bengal Pollution Control Board

DoIT: Department of Information Technology, GoWB

P&RDD: Panchayat & Rural Development Department, GoWB

SWID: State Water Investigation Directorate

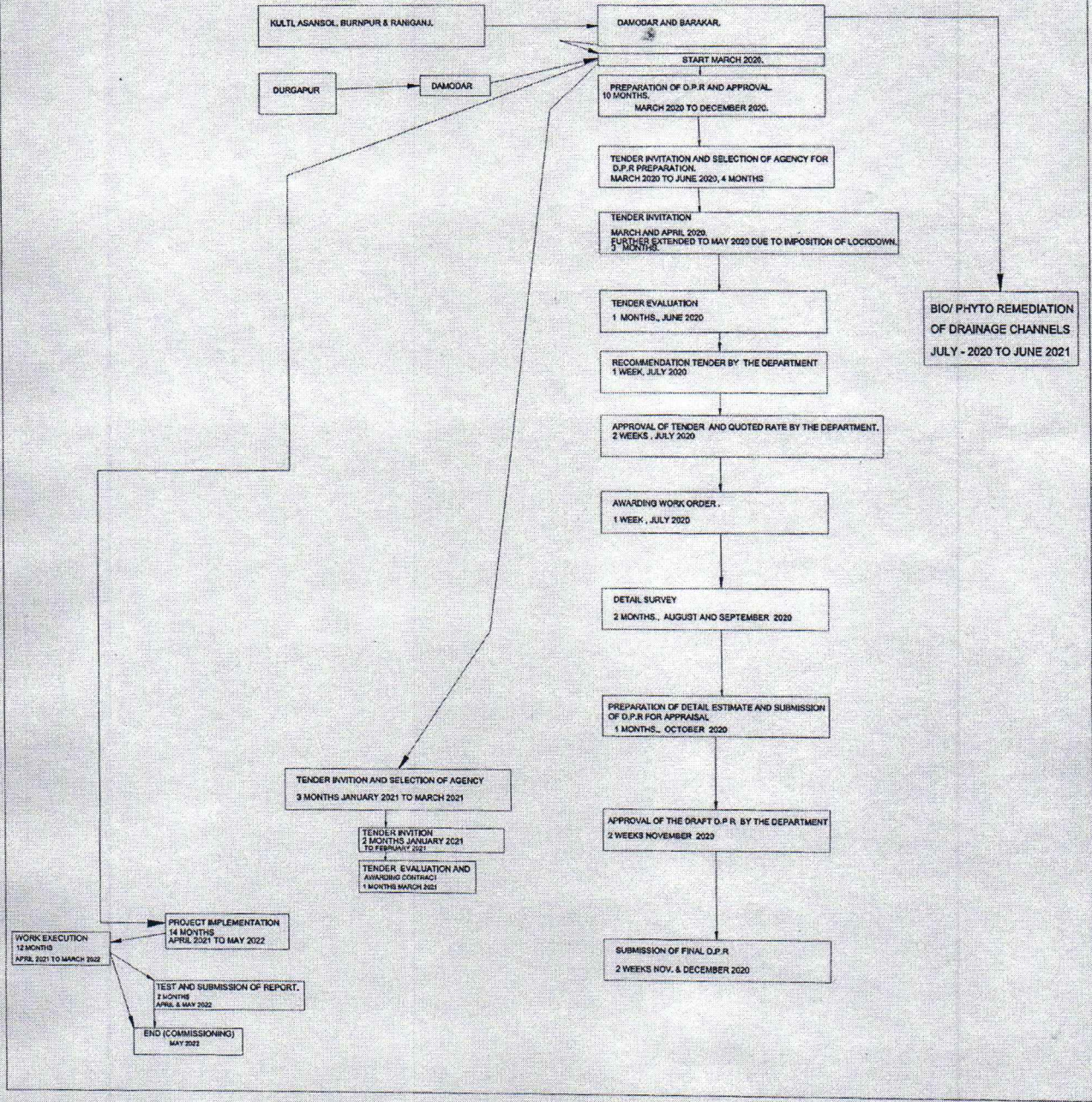
DoAg: Agriculture Department, GoWB

DoUD&MA: Department of Urban Development & Municipal Affairs



Chief Executive Officer  
Asansol Durgapur Development Authority

**PERT CHART IN RESPECT OF IMPLEMENTATION OF ACTION PLAN.  
FOR THE RIVERS STRETCHES OF DAMODAR AND BARAKAR.**



**CHEMICAL ANALYSIS OF GROUND WATER FOR THE DISTRICT OF PASCHIM BARDHAMAN PROVIDED BY  
SWID.**

| SL. NO. | P.H.S. NO. | BLOCK        | LOCATION          | LATITUDE       | LONGITUDE      | ELEVATION | TYPE OF WELL | DEPTH (m.) | M.P. (m.) | pH   | SP Conductivity in $\mu$ mhos/cm | Chloride in mg/L | Carbonate in mg/L | Bi-Carbonate in mg/L | Total Hardness as CaCO <sub>3</sub> in mg/L | Fluoride in mg/L | Total Arsenic in mg/L | Total Iron in mg/L | Total Dissolved Solids in mg/L |
|---------|------------|--------------|-------------------|----------------|----------------|-----------|--------------|------------|-----------|------|----------------------------------|------------------|-------------------|----------------------|---|------------------|-----------------------|--------------------|--------------------------------|
| 1       | H-7        | Asansol      | Asansol           | N 23°41'06.12" | E 86°58'39.36" | 129 m.    | D. Well      | 15.000     | 0.27      | 7.83 | 944.00                           | 120.00           | NIL               | 312.00               | 388.00                                      | 0.47             | BDL                   | 0.16               | 604.00                         |
| 2       | H-8        | Barabani     | Barabani Rly. Stn | N 23°44'32.04" | E 87°01'04.38" | 150 m.    | D. well      | 17.600     | 0.32      | 7.23 | 913.00                           | 98.00            | NIL               | 310.00               | 420.00                                      | 0.59             | BDL                   | 0.22               | 586.00                         |
| 3       | H-6        | Asansol      | Rangpara, Burupur | N 23°39'20.34" | E 86°55'08.76" | 123 m.    | D. well      | 24.650     | 0.80      | 8.20 | 1238.00                          | 142.00           | NIL               | 460.00               | 522.00                                      | 0.52             | BDL                   | 0.32               | 792.00                         |
| 4       | H-11       | Jamuria - II | Chandamore        | N 23°40'01.14" | E 87°02'40.44" | 122 m.    | D. well      | 15.500     | 0.60      | 7.86 | 1375.00                          | 170.00           | NIL               | 428.00               | 548.00                                      | 0.89             | BDL                   | 0.52               | 876.00                         |
| 5       | H-28       | Jamuria - II | Kunasthalia       | N 23°41'44.22" | E 87°07'44.10" | 125 m.    | D. well      | 11.840     | 0.80      | 7.36 | 235.00                           | 18.00            | NIL               | 88.00                | 98.00                                       | 0.22             | BDL                   | 0.65               | 150.00                         |
| 6       | H-15       | Ondal        | Ukhra             | N 23°38'48.54" | E 87°16'26.46" | 109 m.    | D. well      | 14.560     | 0.48      | 7.68 | 484.00                           | 22.00            | NIL               | 172.00               | 220.00                                      | 0.46             | BDL                   | 0.74               | 309.00                         |
| 7       | H-16       | Ondal        | Ondal More        | N 23°35'23.70" | E 87°12'22.62" | 98 m.     | D. well      | 12.070     | 0.80      | 7.99 | 821.00                           | 32.00            | NIL               | 266.00               | 344.00                                      | 0.81             | BDL                   | 0.23               | 526.00                         |
| 8       | H-13       | Raniganj     | Mangalpur         | N 23°37'10.86" | E 87°08'46.08" | 106 m.    | D. well      | 12.000     | 0.70      | 8.13 | 1222.00                          | 98.00            | NIL               | 392.00               | 420.00                                      | 0.92             | BDL                   | 0.36               | 780.00                         |