

ACTION PLAN FOR GABHARU RIVER AT NH 52 NEAR TUMUKI, SONITPUR

PRIORITY V

1. Basic information about the Stretch

The Gabharu is a north bank tributary of the mighty river Brahmaputra. It originates from kalafangapo hill of Arunachal Pradesh in west Kameng district and Sonitpur district of Assam. It is located between the latitude $26^{\circ}55'N$ & $27^{\circ}0'N$ and longitudes $92^{\circ}55'E$ & $93^{\circ}40'E$.

From source to outfall at Brahmaputra, the river generally flows in north-south direction and drains a length of 58 km. Out of this distance only about 6 km lies within Arunachal Pradesh. After traversing through Arunachal Pradesh the river flows through the Chariduar Reserve Forest. It meets the sub-tributary sonai rupai and Mora Depota at latitude $26^{\circ}50'N$ & $26^{\circ}55'N$ respectively. Above the Chariduar Reserve Forest in Assam. After meeting its tributaries the river Gabharu crosses the latitude of $26^{\circ}45'N$ and takes south eastern turn and flows the original north-south directions and crosses the N.F Railway line near Missamari.

The river Gabharu consists of mainly 2 (two) numbers of right bank sub-tributaries namely Sonairupai and Gelgeli river and Mora Depota river is the left bank sub tributary. The total length of Sonairupai is 11 km and the catchment area is 24.17sq.km. The total length of Gelgeli river is 20 km and the catchment area is 62.89 sq.km. The total length of left bank sub tributary Mora Depota is 13.5 km and the catchment area is 35.425 sq.km.

1.1 Polluted river stretch/length

The length of the polluted stretch of Gabharu River is approximately 2 KM with an area of 4 sq.km. (Fig 1). The stretch identified as polluted is from Barati gaon to Puniani gaon.

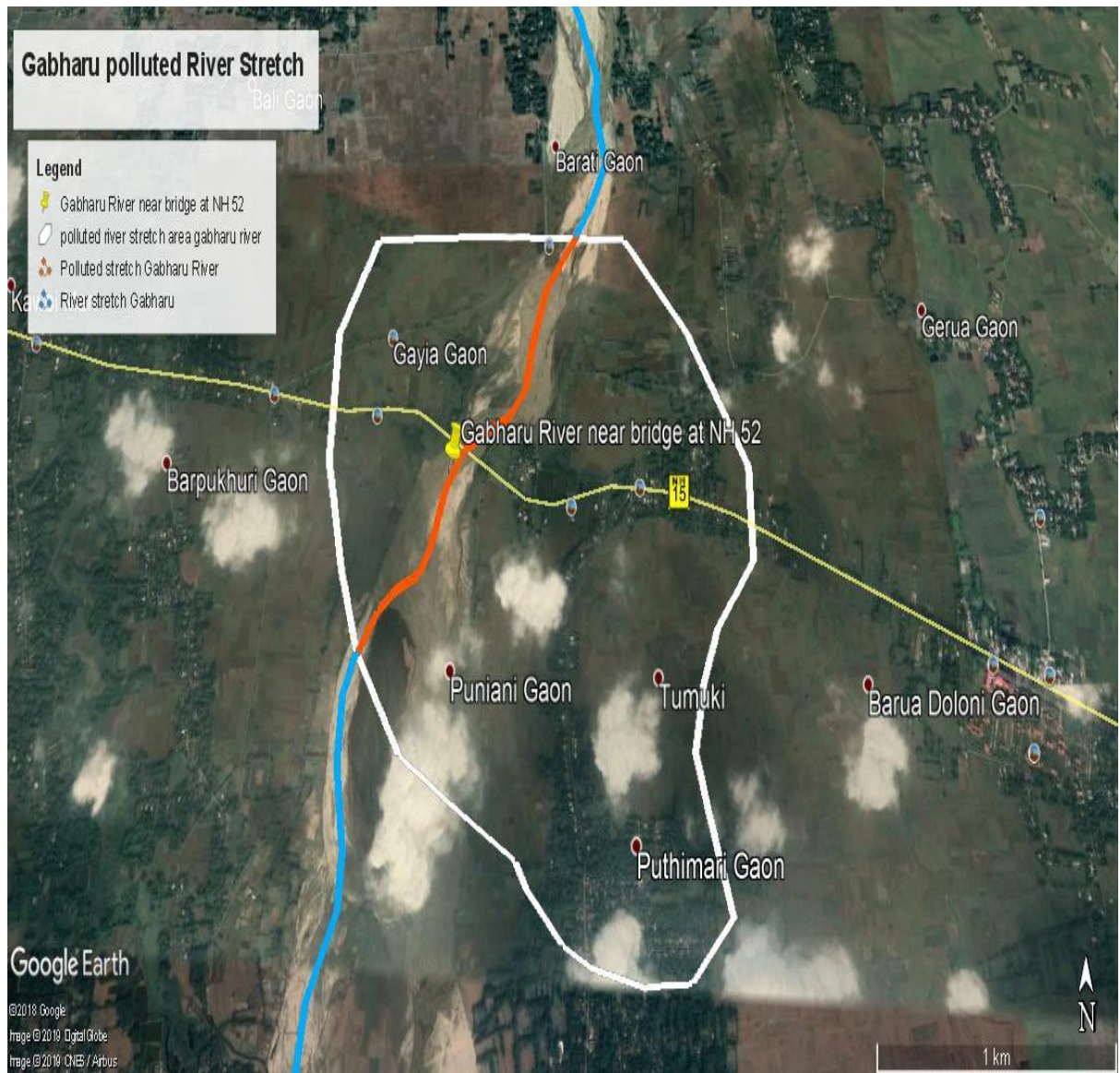


Fig 1: Map showing the polluted river stretch of Gabharu River at NH 15, Tumuki, Sonitpur

2. Background:

In compliance of the direction of Hon'ble National Green Tribunal, Principal Bench, New Delhi in the matter of news published in 'The Hindu' authored by Jacob Koshy, Titled 'More river stretches are now critically polluted CPCB', Government of Assam constituted River Rejuvenation Committee (RRC) vide memorandum 673/2018 dated 19/12/2018 for effective abatement of pollution, rejuvenation, protection and management of the identified polluted stretches, for bringing the polluted river stretches to be fit at least for bathing purposes within six months

3. Basis of Action Plan for Gabharu River at NH 15, Tumuki, Sonitpur polluted river stretch

The action plan for rejuvenation, protection and management of the identified polluted river stretch of Assam has been prepared based on the following

- As per direction of Hon'ble National Green Tribunal, Principal Bench, New Delhi in the matter of news published in 'The Hindu' authored by Jacob Koshy, Titled 'More river stretches are now critically polluted CPCB'
- Comprehensive report on Prevention and Control of Pollution in River Hindon: An Action Plan for Rejuvenation' [Submitted in compliance to Hon'ble National Green Tribunal]

4. Components of Action Plan

(a) Industrial Pollution Control

- Inventorisation of industries
- Categories of industry and effluent quality
- Treatment of effluents, compliance with standards and mode of disposal of effluents
- Regulatory regime.

(b) Identification, Channelization, Treatment and Utilization of Treated Domestic Sewage

- Identification of towns in the catchment of river
- Town-wise Estimation of quantity of sewage generated and existing sewage treatment capacities to arrive at the gap between the sewage generation and treatment capacities;
- Identification of towns for installing sewerage system and sewage treatment plants.
- Storm water drains now carrying sewage and sullage joining river and interception and diversion of sewage to STPs,
- Treatment and disposal of septage and controlling open defecation.

(c) River catchment/Basin Management-Controlled ground water extraction and periodic quality assessment

- Periodic assessment of groundwater resources and regulation of ground water extraction by industries particularly in over exploited and critical zones/blocks.
- Ground water re-charging /rain water harvesting
- Periodic ground water quality assessment and remedial actions in case of contaminated groundwater tube wells/bore wells or hand pumps.
- Assessment of the need for regulating use of ground water for irrigation purposes.

(d) Flood Plain Zone

- Regulating activities in flood plain zone.
- Management of Municipal, Plastic, Hazardous, Bio-medical and Electrical and Electronic wastes.
- Greenery development- Plantation plan.

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

- Issues relating to E-Flow
- Irrigation practices

(d) Such other issues which may be found relevant for restoring water quality to the prescribed standards.

5. Action Plan as per direction of Hon'ble NGT

The components to be discussed in the action plan for rejuvenation, protection and management of identified polluted stretch of Gabharu river are as follows

5.1. Industrial Pollution Control

No industrial estate/notified industrial area is located in the 500m periphery of the Gabharu river catchment area. There are few villages located in the demarcated catchment area of the polluted river stretch as shown in the map. Details of Industrial Pollution Control is presented in Table I below.

Table I: Details of Industrial Pollution Control

| Name of the Industry | Category | Total Water Consumption/ Waste Generation | Without consent/Directives issued | ETPs | CETPs | OCEMS | Gaps | Proposed CETP |
|-----------------------------|-----------------|--|--|-------------|--------------|--------------|-------------|----------------------|
| No notified industrial area | NA | NIL | NIL | NIL | NIL | NIL | NIL | NIL |

5.2. Number of industries- category Red or water polluting/ small scale

No major/minor industrial estate/cluster are located on the 500 m periphery of the river bank.

5.3. Industries without consent/authorisation

Not Applicable

5.4 Number of directions issued to industries

Not Applicable

5.5. Total water consumption and the waste water generation by the industries

As there is no any industrial zone/belt in the catchment area, there is no possibility of water consumption and waste water generation.

5.6. Number of industries having captive ETPs and treatment capacity

Not Applicable

5.7. Number of industries are members of the CETPs

Not Applicable

5.8. Number of CETPs existing in the catchment of the polluted river stretch and the treatment capacity

Not Applicable

5.9. OCEMS installation status by industries

Not Applicable

5.10. Gaps in treatment of industrial effluent

There is no gap in treatment of industrial effluent as the catchment area does not fall under any industrial estates/Clusters.

5.11. Present/proposed CETP capacity/ Member unit

Not Applicable.

6. Identification, Channelisation, Treatment and Utilization of Treated Domestic Sewage

6.1. Major towns located on the bank

There are few villages located in the catchment area of the river namely barati gaon, Puthimari gaon, gayia gaon and Puniani gaon. These villages are under Tumuki gaon Panchayat in Dhekiajuli Tehsil of Sonitpur district of Assam. Major town Tezpur is situated 17 km away from the catchment area of the river.

6.2. Town wise estimation of quantity of sewage generated and existing sewage treatment capacities

The population is very less in the catchment area of the river and are highly scattered. Approximate population of the villages in the catchment area of the river is 2652 as per census of India. As the locality is sparsely populated, the individual households construct their own soak pit, artificial pond for the liquid waste generated by them. Also during its course land absorbs the sewage. There is no any existing sewage treatment Plant.

6.3. Identification of towns for installing sewerage system and sewage treatment plants.

There is no requirement of Sewage Treatment Plant at present as the locality is sparsely populated. Individual households may be encouraged for connecting the liquid waste to the soak pit. Further they can use it for gardening purpose.

Table II: Sewage generation and gaps in treatment

| S.N | Area (sq.km) | Population as per 2011 census (Catchment villages of Gabharu river) | Water Consumption (KLD) @135 lpcd | Sewage Generation (KLD) | No. of STPs | Existing Treatment capacity (KLD) | Gaps in KLD |
|-----|--------------|---|-----------------------------------|-------------------------|-------------|-----------------------------------|-------------|
| 1 | 4 | Barati gaon – 1049 Puniani gaon – 823 Puthimari gaon- 181 Gayia gaon- 599 Total = 2652 | 358 | 286 | NIL | NIL | 286 |

6.4. Water Quality of the river stretch

There is one (01) sampling location of Gabharu River under NWMP as per the following.

Table III: Monitoring Locations Details

| Sampling Location | Coordinates |
|--|----------------------------|
| Gabharu River at NH 15, Tumuki, Sonitpur | 26°41'14" N 92°37'41" E |

The latest water quality trend of in terms of BOD value from July 2017 till April 2019 is presented below:

Table IV: BOD value in mg/l of Gabharu River at NH 15, Tumuki, Sonitpur

| Year | BOD Value (mg/l) | Year | BOD Value (mg/l) | Year | BOD Value (mg/l) |
|--------|------------------|--------|------------------|--------|------------------|
| Jan-17 | | Jan-18 | 1.4 | Jan-19 | 1.9 |
| Feb-17 | | Feb-18 | 0.6 | Feb-19 | 2.2 |
| Mar-17 | | Mar-18 | 2.0 | Mar-19 | 1.6 |
| Apr-17 | | Apr-18 | 1.9 | Apr-19 | 1.8 |
| May-17 | | May-18 | 1.2 | | |
| Jun-17 | | Jun-18 | 1.8 | | |
| Jul-17 | 2.9 | Jul-18 | 3.4 | | |
| Aug-17 | 1.9 | Aug-18 | 3.8 | | |
| Sep-17 | 1.6 | Sep-18 | 3.6 | | |
| Oct-17 | 5.4 | Oct-18 | 1.7 | | |
| Nov-17 | 3.2 | Nov-18 | 1.1 | | |
| Dec-17 | 3.0 | Dec-18 | 2.4 | | |

The above data indicates that the BOD load is above 3 mg/l at six (06) occasions out of twenty two (22) samplings carried out from July 2017 till April 2019. The rise in BOD value at some points of the year may be due to soil erosion and flood in the banks of the river compounded with decay of other organic matter in that area. In Assam the rate of soil erosion is 8000 ha/year.

6.5. Drains contributing to pollution

There is no any sewer line/major or minor drain connecting to the Gabharu river. However embankment on both side of the river bank will reduce the impact of pollution.

6.6. Treatment and Disposal of Septage and controlling Open Defecation

Individual households in the villages are equipped with septic tanks. However, around 1182 toilets have been constructed in the Sonitpur district under the 'IHHL' mission which is an initiative of Swachh Bharat Abhiyan to achieve open defecation free area.

Following remedial actions will be taken in consideration of treatment and disposal of sewage

- Public awareness to control open defecation and understand the importance of toilets.

7. Controlled Ground water Extraction and quality Assessment

Table V: Estimation of ground water resource in the Sonitpur district

| Net Ground Water Availability | 5324.04 mcm | Ground water recharging mechanism | Rain water harvesting |
|--|-------------|--|---|
| Gross Ground Water Draft | 376.47 mcm | Recharging of groundwater are done by creation of Pond/lakes under government schemes. | The roof top rainwater harvesting is practiced. |
| Net Annual Ground Water Draft | 37647 mcm | | |
| Projected demand for domestic and industrial uses up to 2025 | 59.98 mcm | | |
| Stage of Ground Water Development | 16% | | |
| Future Provision for Irrigation Use | 1958.72 mcm | | |

Irrigation Practices in Sonitpur District

Some of the new irrigation schemes of Dhekiajuli tehsil of Sonitpur district are presented in Table VI.

Table VI: Irrigation Practices in Sonitpur District

| S.No | Name of New Scheme | Activity | Command Area/Irrigation potential (Ha) created/ to be created | Concerned Ministry/ Department |
|-------------|---------------------------------------|--------------------|--|---------------------------------------|
| 1 | Per drop more crop (micro irrigation) | Shallow Tube wells | 2493 | MOA & FWDAC & FW |

7.1. Status of Ground Water

In Sonitpur district, ground water of dug well of the district is slightly alkaline (pH= 7.1 to 8.0). Electrical conductance (EC) of ground water varies from 295 to 870 $\mu\text{S}/\text{cm}$. The ground water is soft. Fluoride content is within permissible limit (0.2-0.4 mg/l). Iron content is generally high which varies from 1.8 to 2.2 mg/l.

The district is under safe category and sufficient resources are still available for development

7.2. Remedial Actions

The following remedial actions will be taken in consideration of contaminated ground water sources, controlled ground water extraction and periodic quality assessment

- Ground water of deeper aquifers should be analyzed for periodic assessment of Iron.
- Alternate sources of drinking water should be explored and prioritized.
- Awareness campaigns about health hazards due to intake of excessive Iron is the need of the time.
- Role of pesticides used for agricultural activity should be carefully observed.
- Survey should be conducted regarding ground water uses for domestic purpose and also to identify the over exploited and critical areas in the river stretches with respect to ground water extraction.
- Effective management of sewage for preventing contamination of ground water sources.
- Roof top rain water harvesting techniques should be encouraged for industrial, commercial or individual households and community.

8. Flood Plain Zone

The following are the identified flood prone area for the polluted Gabharu river stretch

| Name of River | Flood plain areas |
|---------------|--|
| Gabharu River | Barati gaon, Puthimari gaon, Gayia gaon, Puniani gaon. |

The Gabharu river embankment details are as follows

| S.N | Embankment | Length (km) |
|-----|------------|-------------|
| 1 | Left bank | 17 |
| 2 | Right Bank | Nil |

8.1. Regulating activities in the Flood Plain Zone

Further following activities need to be regulated in the flood plain zones.

| S.No | Action points | Responsible authority |
|------|--|---------------------------|
| 1 | Plantation in the flood plain zone | Forest Department |
| 2 | Checking Encroachment | Local administration |
| 3 | Demarcation of the flood plain zone | Water Resource Department |
| 4 | Prohibition of disposal of all kinds of wastes | District Administration |

8.2. Waste management status and proposed actions for Municipal solid waste, industrial waste and Bio medical waste management

Table VII: Waste management status and proposed actions

| Type | Status | Proposed Action | Authority |
|----------------------------|---|---|-------------------------------|
| Industrial Waste | ➤ No notified industrial area/cluster have been identified within 500 meters periphery of the catchment area. | ➤ Not Applicable | Pollution Control Board Assam |
| Municipal waste management | ➤ Since the catchment area of the river does not fall under any municipal bodies, the villagers manage and treat their own solid wastes by constructing composting pit and other vermi composting practices etc in their household. | ➤ Village Panchayat concerned should collect municipal solid waste generated from the villages of the catchment area. ➤ Awareness generation regarding | Village Panchayat |

| Type | Status | Proposed Action | Authority |
|-------------------|---|---|----------------------------------|
| | | solid waste management rule. | |
| Plastic waste | ➤ Plastic wastes are being burnt by the villagers in their household | <ul style="list-style-type: none"> ➤ Village panchayats to segregate and collect plastic waste and initiate necessary steps to channelize the waste to authorized agencies for recycling and reprocessing. ➤ Awareness campaign regarding health and other issues related to burning of plastics. | Village Panchayat |
| Hazardous waste | ➤ No notified industrial area/cluster have been identified within 500 meters periphery of the catchment area. | ➤ Not Applicable | Pollution Control Board Assam |
| Bio-Medical waste | ➤ No notified industrial area/cluster have been identified within 500 meters periphery of the catchment area. | ➤ Not Applicable | Health & Family Department |
| E –waste | ➤ No bulk consumers and generators have been identified. | ➤ Not Applicable | Producer Extended Responsibility |

8.3. Gaps identified in waste management

No gaps has been identified in waste management

8.4. Greenery development - Plantation Plan

State has initiated afforestation in the degraded forestland, also raising roadside plantation besides creating check dams/embankments in the river catchment areas to combat erosion and soil conservation.

The following remedial actions has to be initiated in consideration of greenery development

- Raise plantation along the river bank to control the flow run off water directly to the river
- Bamboo species to be raised as it is a good soil binder thereby stabilize the banks of the river from erosion

9. Environmental Flow (E-Flow)

9.1. Stretch of river perennial or non- perennial/flow available/water usage in the stretch

The entire river stretch is perennial. The discharge of Gabharu river as per the master plan of Brahmaputra Board is 352.309 Cum. It is also observed that even during the dry season, the river maintains 50% of the average flow recorded. All the major tributaries of Brahmaputra river are perennial in nature and maintains 50% of the average flow even during non-monsoon season.

9.2. Irrigation practices in the river

The high volume of discharge and water level of the river can be of great use for good irrigation practices for the people. But the farmers of the region usually depends on rain water for cultivation as rainfall is plenty in Assam.

10. Identified organisations responsible for preparation and execution of the action plans

Organisations responsible for preparation and execution of the action plans are as follows:

- Secretary to the Govt. of Assam, Environment and Forest department
- Secretary to the Govt. of Assam, Urban Development department
- Commissioner, Industries and Commerce, Assam
- Member Secretary, Pollution Control Board Assam
- Commissioner, Guwahati Municipal Corporation
- Commissioner to the Govt. of Assam, Water Resource Department
- Divisional Forest officer, Social Forestry, Basistha, Guwahati -29

11. Monitoring mechanism proposed for implementation of action plans

The water quality assessment and evaluation of impacts is necessary to understand the river state at various stages of the project implementation and post implementation of the project. Therefore the water quality assessment and evaluation of the project achievements is essential component for the long term benefit of the project. The monitoring and evaluation also indicate for taking

corrective measure at appropriate time. The ill effects may be controlled by taking step at right time for right cause. The monitoring & evaluation schedule and plan proposed is as under.

11.1 Water Quality Stations (WQS):

The water quality monitoring will include following parameters, which shall be monitored at monthly interval or as and when required. The one complete unit to be purchased and identified parameters to be monitored at defined sampling stations.

The sampling stations are:

- Gabharu river at NH 15, Tumuki, Sonitpur

The parameters to be monitored are as follows.

- | | | | |
|---|--------------------------|---|----------------------------------|
| 1 | pH | 6 | Bio-Chemical Oxygen Demand (BOD) |
| 2 | Turbidity | 7 | Faecal coliform |
| 3 | Conductivity | 8 | Total coliform |
| 4 | Temperature | | |
| 5 | Dissolved Oxygen (DO) | | |

Most of the parameters will be monitored manually and will be incorporated in database.

12. Public Mass awareness etc.

Any river conservation project to be implemented successfully, public awareness is of utmost importance. Unless the public are made aware about the irreversible damage and pollution caused by indiscriminate littering and dumping of waste and garbage in drain and water bodies connected to Gabharu River, the project cannot be implemented in true sense of the word to achieve conservation. Some members of the communities are already aware that there is a need for river conservation programme and that they will be benefitted. Hence, it should be ensured with the following points

- The communities are effectively involved in all the stages of the project cycle from conceptualization, to preparation, to finalization, to implementation and finally O & M.
- Public Awareness & Public Participation should be afffront-end activity of the project

- The entire programme of conservation should be conceived, formulated, implemented, monitored and evaluated in close consultation with the stake holding communities.
- Therefore, education and awareness programmes are key to the sustainability of the various components implemented as part of the river restoration project.

13. Action Plan

Table VIII: Action Points

| Type | Action Points | Responsible Authority | Time Targeted |
|---|---|------------------------------|----------------------|
| Industries | a) No industrial units have been identified within 500 meters periphery of the catchment area. | Not Applicable | |
| Interception and treatment of raw sewage | a) No Sewage Treatment Plant (STP) has been proposed at these villages. | Not Applicable | |
| Ground Water Assessment | a) Conducting survey regarding ground water usage by category wise such as domestic, community, etc. and also identification of over exploited and critical blocks in the river stretches with respect to the ground water extraction. b) Carry out assessment of ground water survey in the catchment area of the identified polluted stretch | PCBA/CGWA | Continuous |

| Type | Action Points | Responsible Authority | Time Targeted |
|--------------------------------|---|---|--|
| | <p>once in a year to ensure quality.</p> <p>c) To promote roof top rain water harvesting by individual households</p> | | |
| <p>Flood Plain Zone</p> | <p>a) Conservation of the river through watershed management.</p> <p>b) Cleaning of the river bed and bank.</p> <p>c) Afforestation on both the banks to prevent soil erosion</p> <p>d) Recreational activities to be promoted.</p> <p>e) Erection of pathway of the river banks.</p> <p>f) Checking encroachment in the flood plain zone of the polluted river stretch</p> <p>g) Prohibition of disposal of municipal, plastic, biomedical and other wastes in the polluted stretch of the river bank</p> <p>h) Demarcation of the flood plain zone.</p> | <p>Soil Conservation Department/Water Resource/Forest Department/Tourism Department/PWD Assam/Local Administration</p> | <p>6 Months (February, 2020 to July, 2020)</p> |
| | <p>The plan for the polluted stretches of the river may be implemented in a time bound manner by fragmenting activities as</p> | <p>Pollution Control Board Assam</p> | <p>3 Months (June, 2019 to August, 2020)</p> <p>a) Monthly Basis</p> |

| Type | Action Points | Responsible Authority | Time Targeted |
|---------------------------|--|--|---|
| | <ul style="list-style-type: none"> a) Assessment of water quality of the polluted stretches on monthly basis has already been commencing b) The monitoring committee may convene meeting of Stakeholder organizations on Quarterly basis with under the chairmanship of Chief Secretary | | |
| Solid Waste | <ul style="list-style-type: none"> a) Prohibition of direct disposal of solid waste in the river banks. b) Frequent River Surface cleaning by removal of debris, plastics etc. | Village Panchayats/ Water Resource Department | 3 Months (November, 2019 to January, 2020) |
| Environmental Flow | <ul style="list-style-type: none"> a) Flow measurement of the river should be carried out by the concerned department and the record has to be maintained b) Fresh water flowing through escape channels/small barrages should be checked. c) The river can be of good potential for irrigation practices and should be carried out by the farmers. | Water Resource Department | Continuous |
| Public Awareness | <ul style="list-style-type: none"> a) Awareness programs to highlight the issues related with the direct discharge of solid waste and open defecation. b) Mass awareness to conserve water. | Village Panchayats/PC BA/NGOs | Continuous |


Members of River Rejuvenation Committee (RRC)



Secretary to the Govt of Assam
Environment & Forest Department



Secretary to the Govt of Assam
Urban Development Department



Commissioner
Industries and Commerce Assam



Member Secretary
Pollution Control Board Assam