ACTION PLAN FOR BURHI DIHING RIVER - PRIORITY V

1. Basic information about the Stretch

Dihing or Burhi Dihing is an important south-bank tributary of the River Brahmaputra and is about 380 kilometres long in Upper Assam in North-Eastern India. The river which has its source in Upper Myanmar flows westward and passes through the Patkai hills in Tirap district of Arunachal Pradesh and passes through the Tinsukia district before entering Dibrugarh district from the east. The river meanders almost through middle of the district and confluences with the River Brahmaputra at Dihingmukh. It has a drainage catchment of 2,465 km^2 spreading across in the districts of Dibrugarh and Tinsukia. The length and width of the plain are around 75 km and 40 km respectively within Dibrugarh district. Its watershed covers about 6,000 square kilometres (2,300 sq mi) and receives about 300 cm average annual rainfall

The meandering Burhi Dihing River being migratory in nature has created a number of oxbow lakes, abandoned channels, swamps on its either banks. This plain is prone to floods causing havoc due to overflowing of water from the Burhi Dihing or its tributaries and inundation caused due to spillage of water in the confluence of this river and Brahmaputra. This flat and low-lying plain is littered with areas of paddy cultivation, forests, and wetlands, while the higher areas are occupied by tea plantations and human settlement.

1 (i) Polluted river stretch/length

The length of the polluted stretch of Burhi Dihing river at Margherita is 2.7 km (approx.) with an area of 7.7 sq.km. (Fig 1). The stretch identified as polluted is from Niz Makum Gaon to Lagun Gaon No. 1 & No. 2 for Burhi Dihing river at Margherita.

Fig 1: Map showing the polluted river stretch of Burhi Dihing River at Margherita

The length of the polluted stretch of Burhi Dihing river at intake point of OIL Duliajan and near Duliajan at D/S of Tinsukia is about 0.9 km with an area of 25 sq.km. (Fig 2) and the identified polluted stretch is from Merbil Majuli No 1 to Dihing Kinar Badhari.

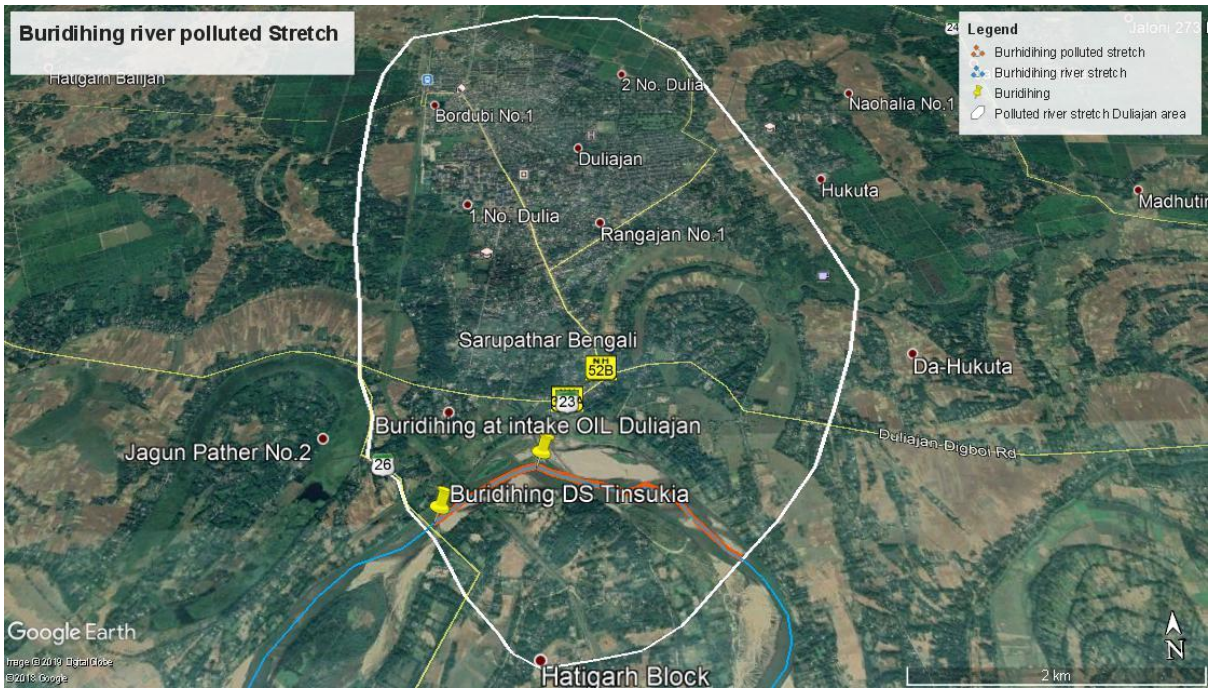

Fig 2: Map showing the polluted river stretch of Burhi Dihing at intake point of OIL Duliajan and D/S of Tinsukia

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 Burhi Dihing 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

(f) 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 Burhi Dihing River are as follows:

5.1. Industrial Pollution Control

Classified industrial units are observed with infrastructural facilities (ETPs, STPs) in the periphery of the polluted river stretch along with few small scale industrial establishments and Tea Estates.

Further directions were issued by the PCBA to all the industrial units which has failed to comply with the discharged norms. Moreover, the Board has also issued direction to build their own set up in their premises which do not have STP/ETP

The classified industry details situated at the radius of the polluted river stretch is presented at **Table I, Table II & Table III.**

Following are the suggestions for control of industrial pollution:

- The industry that will extract groundwater for manufacturing process should not operate unless they possess valid permission for groundwater extraction from Central Ground Water Authority.
- No industries should discharge their effluent directly into drains without treatment, rather they should reuse their treated effluent/sewage.
- Direction to be issued to the units which are not complying to the effluent discharge norms as per Section 5 of the Environment (Protection) Act, 1986, by PCBA for ensuring compliance to the discharge norms.

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

6.1. Major towns located on the bank

Margherita Kumar Potty, Ledo, Makum Pathar No.1, Niz Makum Gaon, Alubari Gaon No.2 are major localities identified in and around the catchment areas of polluted stretch of the Burhi Dihing river at Margherita in Tinsukia district . The approximate population along the polluted stretch of Burhi Dihing River at Margherita is 5,196 as per Census 2011.

Whereas the major towns identified in and around the catchment area of polluted stretch of Burhi Dihing River at Dibrugarh are Duliajan OIL town, Hatigarh Block, 1 No. Dulia, 2 No. Dulia, Rangajan No. 1, Bordubi No.1 and

Sarupathar Bengali. As per Census 2011, the approximate population is 40,356.

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

The major town/village responsible for contribution of sewage in the polluted stretches of Burhi Dihing river are Margherita Kumar Potty, Ledo, Makum Pathar No.1, Niz Makum Gaon, Alubari Gaon No.2 , Duliajan OIL town, Hatigarh Block, 1 No. Dulia, 2 No. Dulia, Rangajan No. 1, Bordubi No.1 and Sarupathar Bengali.

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

As per the survey done, one (01) number of STP has been proposed at Duliajan. However, the sewage generation from the other villages are minimal and hence the untreated sewage can be taken care of by adopting stringent remedial actions.

Table IV: Sewage generation and gaps in treatment at Tinsukia

S.N	Area	Population as per 2011 census	Water Consumption (KLD) @135 lpcd	Sewage Generation (KLD)	No. of STPs proposed	Existing Treatment capacity (KLD)	Gaps in KLD
1	Makum Pathar No.1	2542	343.17	274.54	-	Nil	274.54
2	Niz Makum Gaon	432	58.32	46.66	-	Nil	46.66
3	Alubari Gaon No.2	1145	154.57	123.66	-	Nil	123.66
4	Ledo	848	114.48	91.58	-	Nil	91.58
5	Margherita Kumar Potty	232	31.32	25.05	-	Nil	25.05
Total Sewage generation and gaps in treatment at polluted stretch of Burhi Dihing at Margherita							
Margherita at Tinsukia		**5,196**	**701.46**	**561.2**	**Nil**	**Nil**	**561.2**

Table V: Sewage generation and gaps in treatment at Dibrugarh

S.N	Area	Population as per 2011 census	Water Consumption (KLD) @135 lpcd	Sewage Generation (KLD)	No. of STPs proposed	Existing Treatment capacity (KLD)	Gaps in KLD
1	I No. Dulia	1000	135	108		Nil	108
2	Bordubi No.1	1136	153.36	122.69		Nil	122.69
3	2 No. Dulia	83	11.25	8.96		Nil	8.96
4	Rangajan No.1	266	35.91	28.73		Nil	28.73
5	Duliajan OIL town	28,626	3864.51	3091.6		Nil	3091.6
6	Sarupathar Bengali	8752	1181.52	945.22		Nil	945.22
7	Hatigarh Block	493	66.56	53.24		Nil	53.24
Total Sewage generation and gaps in treatment at polluted stretch of Burhi Dihing at Intake point of OIL, Duliajan & d/s of Burhi Dihing at of Tinsukia, Dibrugarh							
Intake point of OIL, Duliajan & d/s of Burhi Dihing at of Tinsukia, Dibrugarh		**40,356**	**5448**	**4358.4**	**01 (one)**	**Nil**	**4358.4**

6.4. Water Quality of the river stretch

There are three (3) sampling locations of Burhi Dihing at Tinsukia and Dibrugarh district under NWMP which is presented as below at **Table VI**

Table VI: Monitoring Location Details

S.No	Sampling Location	Coordinates
1	At Margherita	27° 17' 25" N 95° 40' 12" E
2	At intake point of Oil India Ltd, Duliajan	27° 19' 40" N 95° 19' 2" E
3	Near Duliajan at downstream of Tinsukia	27° 19' 12 " N 95° 18' 37" E

The change in the water quality of Burhi Dihing in terms of BOD value for the period 2016-2019 is presented below:

Table VII: BOD value in mg/l of Burhi Dihing River at Margherita for the year January, 2016- April, 2019

Year	BOD Value	Year	BOD Value	Year	BOD Value	Year	BOD Value
Jan-16	1.9	Jan-17	3.2	Jan-18	2.6	Jan-19	2.1
Feb-16	2.3	Feb-17	3.6	Feb-18	1.7	Feb-19	2
Mar-16	1.1	Mar-17	2.3	Mar-18	1.3	Mar-19	2.8
Apr-16	2	Apr-17	1.8	Apr-18	1.8	Apr-19	3.6
May-16	0.6	May-17	2.6	May-18	1.2		
Jun-16	2.2	Jun-17	2.8	Jun-18	1.5		
Jul-16	4	Jul-17	1.9	Jul-18	2.7		
Aug-16	2.2	Aug-17	2.6	Aug-18	1		
Sep-16	1.2	Sep-17	1	Sep-18	1.1		
Oct-16	1.9	Oct-17	1.2	Oct-18	1.6		
Nov-16	1.3	Nov-17	2	Nov-18	1.1		
Dec-16	3	Dec-17	1	Dec-18	2		

Table VIII: BOD value in mg/l of Burhi Dihing near Duliajan at downstream of Tinsukia for the year January, 2016- April, 2019

Year	BOD Value	Year	BOD Value	Year	BOD Value	Year	BOD Value
Jan-16	1.4	Jan-17	1.7	Jan-18	2.5	Jan-19	3
Feb-16	2.4	Feb-17	1.8	Feb-18	1.1	Feb-19	2
Mar-16	1.7	Mar-17	1.1	Mar-18	1.3	Mar-19	2.6
Apr-16	1.3	Apr-17	2.2	Apr-18	1.1	Apr-19	2.8
May-16	0.6	May-17	3.1	May-18	2.2		
Jun-16	2.5	Jun-17	2.1	Jun-18	2.4		
Jul-16	1.8	Jul-17	1.8	Jul-18	1.3		
Aug-16	0.8	Aug-17	2.4	Aug-18	1.4		
Sep-16	1.2	Sep-17	4.6	Sep-18	0.9		
Oct-16	2.1	Oct-17	3.2	Oct-18	1.6		
Nov-16	1.7	Nov-17	1.7	Nov-18	3		
Dec-16	2.2	Dec-17	1	Dec-18	2.1		

Table IX: BOD value in mg/l of Burhi Dihing at intake point of OIL, Duliajan, Tinsukia for the year January, 2016- April, 2019

Year	BOD Value	Year	BOD Value	Year	BOD Value	Year	BOD Value
Jan-16	1.9	Jan-17	1.5	Jan-18	1.1	Jan-19	2.6
Feb-16	2.6	Feb-17	2.8	Feb-18	1.3	Feb-19	1.4
Mar-16	1	Mar-17	1.1	Mar-18	1.7	Mar-19	2.4
Apr-16	0.6	Apr-17	3.3	Apr-18	2.4	Apr-19	1.0
May-16	2.1	May-17	2.5	May-18	1		
Jun-16	1.7	Jun-17	4.4	Jun-18	1.1		
Jul-16	2	Jul-17	1.5	Jul-18	2.7		
Aug-16	3.8	Aug-17	1.4	Aug-18	2.1		
Sep-16	2.1	Sep-17	1.2	Sep-18	2.1		
Oct-16	1.5	Oct-17	1.8	Oct-18	1.6		
Nov-16	1.9	Nov-17	1	Nov-18	1.9		
Dec-16	2	Dec-17	1.4	Dec-18	3.3		

The above data indicated that BOD value has increased in only five (05) occasions out of forty (40) occasions at polluted stretch of Burhi Dihing in Margherita and only nine (09) occasions out of 80 occasions at polluted stretch of Burhi Dihing at Duliajan, Dibrugarh. The increase of BOD load which indicates organic load may be due to draining of storm runoff along with the organic waste originating from domestic household waste into the river through the drains. The marginal increase of BOD level during dry period may probably be due to decomposition and high concentration of organic matter as their rate of dilution is very low due to lean flow of the river. Moreover, Assam is cursed with the catastrophic flood every year and hence this incidental exceedance of BOD value may be due to additional organic matter introduced in the river as a result of continuous rainfall during this disastrous calamity. This marginal and occasional exceedance of BOD level does not reflect the extremity of pollution. Hence this can be considered as incidental and can be omitted from the polluted river stretch.

6.5. Drains contributing to pollution

Seven major drains have been identified at Margherita, which are responsible for draining off majority of the municipal, industrial and commercial waste from the surrounding areas to the Burhi Dihing river at Margherita.

Table X: Major channels/drains of Tinsukia and Dibrugarh District contributing to the pollution load of the River

Sl. No	Polluted river stretch	Name of drain	Location	
1	Burhi Dihing River at Margherita	Namdang	Near Namdang T.E	There is no such major drain discharging which directly discharge into the Burhi Dihing River. However, these drain meets the river at various points
2		Oil fire brigade drain	Near Margherita Railway gate	
3		Dihing Poria drain	Dihing Poria gaon	
4		Bazaar Drain	Margherita main bazar	
5		Segunbari drain	Segunbari tiniali	
6		Gorumarajan drain		
7		Faltu Gaon drain		
8	Burhi Dihing River at downstream of Tinsukia	No major drain outffall	-	-
9	Burhi Dihing River at intake point of OIL, Duliajan	Main Leader Drain	Fancy Bazar Culvert to Burhi Dihing River	-
10		Tipling rivulet nullah	Tipling area	Treated effluent from NEEPCO is discharged to the Tipling rivulet which finally meets Burhi Dihing

6.6. Characteristics of the major drains

The drains mainly carries industrial as well as residential wastes. Direct dumping of residential and commercial garbage into the channel is making it shallower and heavily silted. As a result, during rainy season water overflows and inundates the areas. It is also observed that the drains of the town are also becoming a regular garbage-dumping site. Moreover, these drains are not planned properly to carry even the regular water.

6.7. Flow details of the major drains contributing to river pollution

Action initiated to measure the flow of various out falling drains.

6.8. Sewage generation from the towns located on the banks of the polluted river

The main contributor of pollution in the river is municipal sewage. There are no treatment systems for the sewages which are dumped in open thereby ultimately finding their ways to water bodies without treatment. Moreover, Sewage treatment facility has not been set up yet in Assam.

6.9. Number of Sewage treatment plants present and treatment capacity, and gaps

There is no any sewage treatment plant at present.

6.10. Number of STPs proposed and capacity

As per the survey done, one (01) number of STP has been proposed at Duliajan Town.

6.10. Interception and diversion of drains /in situ treatment given

One (01) number of STP has been proposed along with interceptor drains for in situ treatment before outfall.

6.11. Drainage system/ sewerage network present/proposed

Some natural drainage of local origin are acting as the drainage system to evacuate sewage originating from domestic households, commercial establishments, institutes, industries etc.

There is no sewerage system at present. No sewerage system has been proposed under this project. In this project one (01) number of STP along with interceptor drains for collection of the sewage of the basin has been proposed. All the sewage of the catchment area of the river shall be collected by interceptor drains and shall be treated in the proposed STP before outfall in to the river.

6.12. Treatment and Disposal of Septage and controlling Open Defecation

Some of the households in the towns are equipped with ordinary septic tanks. Under the Swacch Bharat Abhiyan, Public Health Engineering has constructed 308 and 262 numbers of IHHL in Dibrugarh and Margherita to

attain open defecation free status. Moreover, public toilets have also been constructed at the commercial areas.

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

- Sewage Treatment plant should be installed for treatment
- The discharge should be trapped by strainers before draining off to the river.
- Every individual households should be connected to sewer lines.
- Every households should be recommended to have individual drainage that should be connected to soak pits or stagnated pool.
- Roadside hotels/restaurants should not be allowed to dispose untreated sewage and solid waste into the nearby drains or rivers. These establishments should be properly regulated by the concerned authority.
- Public awareness to control open defecation and understand the sanitary hygiene.
- Local administration should provide proper pucca toilets for the individuals or atleast community toilets through the IHHL scheme under Swachh Bharat Mission.

7. Controlled Ground water Extraction and quality Assessment

The district is potential from ground water point of view as revealed by the studies carried out by CGWB. The stage of ground water development in Dibrugarh and Tinsukia districts are 12 % and 15%.

The details of estimated ground water resource in the Tinsukia and Dibrugarh district is presented below

Table XI: Estimation of ground water resource in Tinsukia district

Ground water extraction details	Ground water (MCM)	Irrigation practices	Ground water recharging mechanism	Rain water harvesting
Net Ground Water Availability	1590.36	Minor and medium irrigation schemes such as DTW and STW	Recharging of groundwater are done by creation of Pond/lakes under government schemes.	The roof top rainwater harvesting is practiced.
Gross Ground Water Draft	166.97			
Stage of Ground Water Development	12%			

Future provision for Domestic & Industrial Use	42.57			
Future Provision for Irrigation Use	1252.3			

Table XII: Estimation of ground water resource in Dibrugarh district

Ground water extraction details	Ground water (MCM)	Irrigation practices	Ground water recharging mechanism	Rain water harvesting
Net Ground Water Availability	1889.11	Minor and medium irrigation schemes such as DTW and STW	Recharging of groundwater are done by creation of Pond/lakes under government schemes.	The roof top rainwater harvesting is practiced.
Gross Ground Water Draft	266.76			
Stage of Ground Water Development	15 %			
Future provision for Domestic & Industrial Use	37.45			
Future Provision for Irrigation Use	1519.49			

7.1. Status of Ground Water

The quality of ground water in the Dibrugarh and Tinsukua district is suitable for both the drinking and irrigation purposes.

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 element like Arsenic, Fluoride, Iron etc.
- Alternate sources of drinking water should be explored and prioritized.
- Awareness campaigns about health hazards due to intake of excessive Arsenic, Fluoride are the need of the time.
- Role of pesticides used for agricultural activity should be carefully observed.

- Survey should be conducted regarding ground water uses by different categories such as domestic, Industries etc and also to identify the over exploited and critical areas in the river stretches with respect to ground water extraction.
- Effective management of industrial effluent or sewage for preventing contamination of ground water sources.
- The industry that will extract groundwater for manufacturing process should not operate unless they possess valid permission for groundwater extraction from Central Ground Water Authority.
- Strict vigilance and conducting inspection of the industries to rule out any forceful treated effluent injection in to ground water resources.
- 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 river stretch

Sl. No	Name of River	Flood plain areas
1	Burhi Dihing River at Margherita	Niz Makum Gaon and Alubari Gaon No 2

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

Table XIII: Management of Industrial, Municipal, Biomedical, Plastic and Electronics Waste

Sl. No	Type	Status	Proposed actions	Authority
1	**Industrial Waste**	➢ Authorisation have been granted to different industries in line with Water act 1974, Hazardous Waste (Management, Handling and Transboundary Movement) Rule, 2008 as amended. ➢ Regular monitoring by PCBA to ensure that the terms and conditions are strictly adhered in accordance with the prescribed standards.	Direction issued to the industries to identify the non-point sources and arrest contamination of storm water.	Pollution Control Board Assam
2	**Municipal waste**	➢ Municipal Body has engaged NGOs ward wise for collection of Municipal Solid Waste from the generation point for treatment and disposal. ➢ The wastes are being segregated into dry and wet waste categories and are collected separately and transported to treatment and disposal site.	Municipal Body is in process of inducting the following activity ➢ Implementation of segregation of waste at source ➢ Door-to-door garbage Collection of waste ➢ Formation of Sanitation task Force ➢ Formation of Neighbourhood Community ➢ Awareness campaigns Processing and disposal of waste	Municipal Body
3	**Plastic Waste**	➢ At present plastic wastes are being dumped along with Municipal solid waste.	➢ Issue directions to Municipal Board to segregate and collect plastic waste and initiate necessary steps to channelize the waste to authorized agencies for recycling and reprocessing	Tinsukia and Dibrugarh Municipality Board
4	**Hazardous Waste**	➢ No hazardous wastes are directly disposed in the river	➢ Awareness campaign regarding health and other	Pollution Control Board Assam

Sl. No	Type	Status	Proposed actions	Authority
			issues related to Hazardous waste	
5	**Bio-medical Waste**	➢ Segregation at the source under Biomedical waste Management Rules, 1998 as amended ➢ Bio-Medical Waste generated from the HCFs are disposed through the facility available at Assam Medical College Hospital, IOCL hospital, Oil India Hospital and Central Hospital, Longsowal. ➢ Most of the HCFs have already installed ETP for treatment of liquid wastes generated from the HCFs .	Direction issued to all HCF unit to implement the BMW Rules, 2016 as ammended in all HCF Units. (As per guidelines of CPCB)	HCF units/Pollution Control Board Assam
6	**E –waste**	➢ E-Waste Inventorisation and Annual return in (Form-3) is submitted by E-Waste generating units to PCBA from time to time for onwards transmission to CPCB ➢ There is no authorised recycler	-	Pollution Control Board Assam

8.3. Gaps identified in waste management

Presently, approximately 3117.6 Kg/day and 24213.6 Kg/day of gaps has been identified for municipal solid waste management in Tinsukia and Dibrugarh District.

8.4. Greenery development - Plantation Plan

State Forest Department 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 maximum discharge of the river is 3151.58 Cum. It is also observed that even during the dry season, the river maintains 50% of the average flow recorded.

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.

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 and evaluation schedule and plan is proposed, which 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:

- Burhi dihing River at Margherita
- Burhi dihing river at downstream of Tinsukia
- Burhi Dihing river at intake point of OIL, Duliajan

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 Burhi dihing 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 affront-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.