

**ACTION PLAN FOR RESTORATION OF POLLUTED STRETCH OF
BUDHABALANGA RIVER ALONG MAHULIA TO BARIPADA
UNDER PRIORITY CATEGORY-V**

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EXECUTIVE SUMMARY ON PROPOSED ACTION PLANS

Sl. No.	DESCRIPTION OF ITEM	Details
1.	Name of the identified polluted river and its tributaries	: Budhabalanga River. Major tributaries are Sunei, Kalo, Katra, Sono etc. The identified polluted stretch is on Budhabalanga river from Baripada D/s to Balasore D/s
2.	Is river is perennial and total length of the polluted river	: Budhabalanga river is a perennial river with a length of approximately 198.75 Km from its origin to its confluence with Bay of Bengal.
3.	No of drains contributing to pollution and names of major drains	: Wastewater drain of Baripada Municipality and Balasore Municipality are discharged to storm water drains which ultimately flows into the river
4.	Whether 'River Rejuvenation Committee (RRC) constituted by the State Govt./UT Administration and If so, Date of constitution of 'RRC'	: Yes. Constituted by the State Government vide letter No. 24426 dated 12.11.2018
5.	Whether 'River Rejuvenation Committee (RRC) have approved the Action Plan :	Yes. RRC have approved the Action Plan in its 3 rd meeting held on 04.06.2018.
6.	Major Towns on the banks of the river with population	: Baripada (Population : 116,849) Balasore (Population : 144,373) as per 2011 census
7.	a. Total no. of existing STPs and the total capacities in MLD	: No STP has been established.
	b. Total MSW generation in TPA	: Baripada :50 TPD (18,250 TPA) Balasore : 43 TPD (15,695 TPA)
	c. Existing treatment and disposal facilities and total capacity	: Total MSW is being disposed in the earmarked dumping yard.
8.	a. Major industrial estates located with total no. of industries	: In Baripada, no water intensive industries have been established. In Balasore, one Industrial Estate in the catchment of polluted river stretch. One large Pulp and Paper Mill is located.
	b. No of CETP's and their treatment capacity	: Nil
	c. Gaps in treatment of industrial effluent	: Nil

	d. Existing HW Treatment and Disposal Facilities and total capacity with life span	:	Either dumped in secured landfill area within the industry premises or disposed off to the Common Hazardous Waste Treatment, Storage and Disposal Facility.
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1.0 Background

Water quality assessment of Budhabalanga river has been carried out by the State Pollution Control Board, Odisha under the project “National Water Quality Monitoring Programme” at three locations, Baripada Downstream (D/s) in Mayurbhanj district and Balasore Upstream (U/s) and Balasore Downstream in Balasore district from January, 2009. The Biochemical Oxygen Demand (BOD) range in this stretch of Budhabalanga river during was observed to be in between 0.4-3.5 mg/l during 2016 and in between 0.6-3.2 mg/l during 2017. BOD has exceeded the tolerance limit of 3.0 mg/l only at Balasore D/s marginally twice during the year 2016 and marginally once during 2017.

The polluted river stretches are categorized under five different priorities based on the BOD values as per Central Pollution Control Board (CPCB) classification. Monitoring locations with BOD concentration exceeding 30 mg/l have been categorized as Priority-I. Monitoring locations with BOD concentrations in the range 20-30 mg/l, 10-20 mg/l, 6-10 mg/l and 3-6 mg/l are categorized as Priority-II, Priority-III, Priority-IV and Priority-V respectively. Based on this classification, the river stretch of Budhabalanga river has been categorized by CPCB under Priority-V with the maximum BOD value being 3.5 mg/l with the identified polluted stretch being Mahulia to Baripada.

2.0 Water quality of Budhabalanga river

River Budhabalanga originates from the Similipal range of hills in Mayurbhanj district of Odisha and plunges through Barehipani falls, the second highest waterfall in India. It flows in Mayurbhanj district and Balasore district and finally empties into the Bay of Bengal near Balaramgadi village of Balasore district. The river travels a total length of 198.75 Km. Satellite image of Budhabalanga river and location of water quality monitoring stations are given in Fig. 1.

Water quality of Budhabalanga river is being monitored by the Board on regular basis at three locations, such as Baripada D/s, Balasore U/s and Balasore D/s. Monthwise water quality data of Budhabalanga river with respect to Biochemical Oxygen Demand (BOD) during the year 2016, 2017 and 2018 are given in Table-1.



Fig. 1 Satellite image of Budhabalanga river and location of water quality monitoring station on Budhabalanga river

Table-1 Monthwise BOD (mg/l) in Budhabalanga river during 2016, 2017 and 2018

Month	BOD, mg/l								
	2016			2017			2018		
	Baripada D/s	Balasore U/s	Balasore D/s	Baripada D/s	Balasore U/s	Balasore D/s	Baripada D/s	Balasore U/s	Balasore D/s
January	0.6	0.4	0.7	1.2	0.7	2.1	1.6	1.0	2.3
February	2.3	2.0	2.6	1.9	1.6	2.0	1.6	2.3	2.8
March	0.8	1.8	1.9	1.6	1.5	2.9	1.1	1.2	1.6
April	1.2	2.2	1.2	0.8	1.2	2.4	1.6	1.3	2.7
May	1.4	1.1	3.5	1.5	1.3	3.2	1.0	0.2	1.0
June	2.7	1.1	3.4	0.9	0.8	1.6	0.7	0.6	1.2
July	1.6	0.6	0.8	1.3	1.8	2.0	0.9	1.2	1.9
August	0.8	1.4	1.6	0.6	1.0	2.0	0.7	0.7	1.3
September	2.4	1.5	2.5	0.9	1.1	1.0	0.9	0.7	1.1
October	0.8	1.6	0.7	1.4	0.8	1.8	0.8	0.5	1.2
November	1.2	1.5	2.2	0.9	0.6	1.5	1.0	1.3	1.6
December	0.6	0.5	1.2	1.1	1.1	1.8	0.6	0.6	1.0
Minimum BOD, mg/l	0.6	0.4	0.7	0.6	0.6	1.0	0.6	0.2	1.0
Maximum BOD, mg/l	2.7	2.2	3.5	1.9	1.8	3.2	1.6	2.3	2.8
Average, BOD, mg/l	1.4	1.3	1.9	1.2	1.1	2.0	1.0	1.0	1.6

The data shows that BOD varied within 0.4-3.5 mg/l during 2016, within 0.6-3.2 mg/l during 2017 and 0.2-2.8 mg/l during 2018. BOD has exceeded the tolerance limit of 3.0 mg/l marginally twice during 2016 at Balasore D/s (May, 2016 (3.5 mg/l) and June, 2016 (3.4 mg/l) and marginally only once during May, 2017 (3.2 mg/l) at Balasore D/s. However, during 2018, BOD has never exceeded the tolerance limit at any location of monitoring.

3.0 Sources of Pollution

- **Municipal wastewater**

There are two urban local bodies, such as Baripada Municipality (population 116,849 as per 2011 census) and Balasore Municipality (population 144,373 as per 2011 census) situated on the bank of Budhabalanga river. The distance between Baripada municipality and Balasore municipality is approximately 60 Km.

Domestic wastewater of Baripada Municipality outfalls into two natural stream, Sarali and Jarali nallahs which ultimately discharge to Budhabalanga river. However, the BOD level in Budhabalanga river at downstream of Baripada has not exceeded the tolerance limit of 3.0 mg/l during the period 2016- 2018.

Similarly, domestic wastewater of Balasore Municipality outfalls into a natural stream, Bada nalla, which ultimately is being discharged to Budhabalanga river. At the downstream of Balasore, two other small tributaries of Budhabalanga river join with the river. Further, the meandering nature of river course at the downstream of Balasore has increased the self-purifying capacity of the river. Therefore, the BOD level in Budhabalanga river at downstream of Balasore town remained almost within the tolerance limit of 3.0 mg/l during the period 2016-2018 excepting very few occasions. (Marginally twice during 2016 and marginally once during 2017).

- **Industrial wastewater**

There is no water intensive industries are located in the Baripada town. Therefore, there is remote chance of contamination of Budhabalanga river by industrial wastewater from Baripada town.

The industries located within the Balgopalpur Industrial Estate of Balasore have established their own effluent treatment plants to treat the industrial wastewater. One large pulp and paper mill situated in this industrial estate discharge 3000 KLD treated industrial wastewater after complying to the discharge standard laid down by the State Board in its consent order, to the nearby natural stream namely, Swapna nallah. The nallah outfalls into Sona river which ultimately discharges into Budhabalanga river. Therefore, there is remote chance of contamination of Budhabalanga river by industrial wastewater from Balasore town.

- **Biomedical waste**

Around 90 Kg of biomedical waste per day is generated from 12 health care units existing in Baripada municipality.

Around 160 Kg of biomedical waste per day is generated from 53 health care units existing in Balasore municipality.

The biomedical waste generated by the respective health care units in these two municipalities are dumped in earthen pits constructed within its premises as per deep burial disposal practice suggested under Biomedical Waste (Management and Handling) Rule, 2016. Therefore, there is remote possibility of contamination of Budhabalanga river by biomedical waste generated from Baripada and Balasore municipalities

- **Municipal solid waste**

Around 50 TPD municipal solid waste is generated from Baripada Municipality and 43 TPD municipal solid waste is generated from Balasore Municipality. The solid waste are collected on door to door basis as well as from community bins and are dumped in earmarked areas which are far away from the river embankments. Therefore, the municipal solid waste dumping have no impact on the river water quality.

4.0 Action plan for restoration of Water quality of Budhabalanga river

BOD values of Budhabalanga remained within the tolerance limit of 3.0 mg/l during the period 2017-2018 excepting only one occasion (May, 2017) at Balasore D/s. Such single marginal deviation during lean period may be treated as outlier or may be due to some incidental effects.

In Para 42 of the order of the case No. 673/2018 (More river stretches are now critically polluted), Hon'ble NGT has suggested a two-fold concept for restoration of polluted river stretches as follows.

1st concept : To target enhancement of river flow through interventions on the water sheds/ catchment areas for conservation and recharge of rainwater for subsequent release during lean flow period in year. This concept will work on dilutions of pollutants in the rivers and streams to reduce concentration to meet the desired level of water quality.

2nd concept : Regulation and enforcement of standards in conjunction with the available flow in rivers/ streams and allocation of discharges with stipulated norms.

BOD value in the river most of the time remains within 3.0 mg/l excepting a single occasion. The water quality of the river can be maintained within the tolerance limit throughout the year by enhancement of river flow through interventions of the river catchment area for conservation and recharge of rainwater for subsequent release during lean flow period in the year.

The implementation of Swachh Bharat Abhiyan and construction of individual household toilets and community/public toilets, provision of water supply and increase in awareness among local inhabitants have significantly reduced the open defecation practice of the local inhabitants in the stretch.

Septage Management program under AMRUT yojana of Govt. of India is under operation in both Baripada (50 KLD) and Balasore municipality (60 MLD) with total sanctioned project cost of Rs. 183.21 lakhs and Rs. 89.07 lakhs respectively.

For wastewater treatment of both the Municipalities prior to discharge to Budhabalanga river, National Environmental Engineering Research Institute (NEERI), Nagpur has been awarded to treat the wastewater by phytoid technology.

The Urban development Department has taken measures for waste management in Baripada town by commissioning one decentralized composting unit at Mahila khadan in Raghunathpur ward. A sewerage treatment plant with an estimated cost of Rs. 2.5 crore is

being constructed in Baripada. Baripada municipality has also been declared as Open defecation free in Mayurbhanj district in the year 2018 under Swachh Bharat mission.

Budhabalanga river is mainly fed through several streams originating from Similipal hill range and therefore during summer season the flow in the river is less. To maintain e-flow in the river and water-shed management of the river in Mayurbhanj district, Water Resource Department in Government of Odisha has a proposal to construct a Barrage at village Kamata in Kuliana Block of Mayurbhanj District across the River Budhabalanga under the Budhabalanga Barrage Project. The catchment area of the proposed project is 1008 Sq K.M The Project has planned to irrigate 8523 Ha. of C.C.A. with 95.00% intensity during Khariff. Total cost of the project is Rs. 24,237 lakhs.

Industries operating in Balagopalpur industrial Estate of Balasore have been instructed by the Board to install rain water harvesting structures as a mean to ground water recharge.

5.0 Implementing Authority

Panchayati Raj and Drinking Water Department in Govt. of Odisha has the mandate to implement Swachh Bharat Abhiyan (Gramin) in all the village and make the people of peripheral villages of river aware to use toilets and to provide health sanitation facilities.

Odisha Water Supply and Sewerage Board (OWSSB) under Housing and Urban Development Department in Govt. of Odisha is the implementing authority for implementation of AMRUT yojana and wastewater management project in both Baripada and Balasore Municipalities.

6.0 Conclusion

From the discussions in the foregoing sections it may be concluded that the impact of municipal wastewater, industrial wastewater and solid waste on the water quality of Budhabalanga river is insignificant. The frequency of deviation in BOD values from the tolerance limit of 3.0 mg/l in the river stretch from Baripada D/s to Balasore D/s has been decreased 6% during 2016 to 3 % during 2017 and no deviation in BOD values has been observed during 2018. **Therefore the river stretch may be considered as not polluted.**

On the above background, the categorization of the river stretch of Budhabalanga River by CPCB under Priority category – V with the identified stretch “Mahulia to Baripada” and maximum BOD values in the range 3.5 mg/l needs reconsideration. The stretch may be corrected as **“Baripada D/s to Balasore D/s”** instead of **“Mahulia to Baripada”** as identified by CPCB. Further, because of marginal deviation in BOD value (twice in 2016, single in 2017) and no deviation during 2018, the **stretch may be deleted from the list of polluted river stretch.**
