

Proposed Action Plan for Rejuvenation of River Bhadra



Karnataka State Pollution Control Board

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ACTION PLAN FOR REJUVENATION OF RIVER BHADRA

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Proposed action plan for Rejuvenation of River Bhadra

05. State : Karnataka

River Name: **Bhadra**

River Stretch: **Holehunnur to Bhadravathi**

Priority : **IV (BOD 6-10 mg/L)**

BOD Range: **5.5-7.8 mg/L**

1. Bhadra river at Bhadravathi city:

The Bhadra River is a river in Karnataka state in southern India. The Bhadra originates at Gangamoola near Kudremukha, Western Ghats range, and flows east across the southern part of Deccan Plateau, joined by its tributaries the Somavahini near Hebbe, Thadabehalla, and Odirayanahalla. It flows through the towns of Kudremukh, Kalasa, Horanadu, Balehonnur, Balehole and Narasimharajapura(N.R Pura). A dam is built across the river near Lakkavalli which forms the Bhadra reservoir (186 ft). From here the river continues its journey through the city of Bhadravathi, Karnataka. The Bhadra meets the Tunga River at Koodli, a small town near Shivamogga. The combined river continues east as the Tungabhadra, a major tributary of the Krishna, which empties into the Bay of Bengal.

Bhadra river water quality is being monitored in a stretch of about 16 Kms from NH-206 bypass bridge to Kudli confluence point. The samples are being collected at 5 locations namely, at the bypass bridge on left bank (i.e., upstream of M/s. The Mysore Paper Mills Ltd.), at the railway bridge on left bank (i.e., downstream of M/s. The Mysore Paper Mills Ltd.), at the Bhadravathi city bridge at center (i.e., downstream of Bhadravathi city), at the Holehonnur bridge on the right bank and finally at Kudli confluence point. **The total polluted stretch of the River from Holehonnur to Bhadravathi city is about 10 kms.**



Figure 1. The Bhadra River Stretch

2.0 Major Pollution Sources:

- a) Treated waste water from M/s.MPM. Now this industry is not working and there is no discharge of treated trade effluent into the river.
- b) The main source of pollution is from Bhadravathi city sewage.
- c) The other source of pollution is from bathing, washing of clothes and vehicle washings and other anthropogenic activities.
- d) Non point sources from agriculture fields etc.

2.1Entry of industries effluent :

M/s. Bhadra Packaids (P) Ltd., M/s. VISL (SAIL) are the two major Large Red industries and M/s. The Mysore Paper Mills Ltd., is the Large Red 17 Category industry located on the bank of the Bhadra river near Bhadravathi city. These three industries are drawing the water from Bhadra river. The treated trade effluent and the treated sewage from M/s. The Mysore Paper Mills Ltd., is being discharged into natural nala which finally joins Bhadra river. Now MPM industry is not working and there is no discharge of treated trade effluent into the river. The treated sewage from M/s. VISL is also discharged into Bhadra river. There are no other major industries which are discharging the liquid wastes into the River Bhadra.

2.2 Treatment of Sewage:

The STP of capacity 5.83MLD is in an extent of land 14.06 acres and is established at Jatpet Nagar, Bhadravathi which caters only few areas . The STP is not functioning properly. The sewage generated from other parts of Bhadravathi city is joining Bhadra river without treatment. **40% of UGD facility has been provided for Bhadravathi ,CMC.**

2.3. Municipal Sewage generation and Treatment

The Town wise sewage generation and treatment capacity developed so far is provided in **Table-1**

Table-1: Status of Domestic Pollution in River - Bhadra

Sl No.	Name of the local body	Type	Total Sewage generation in MLD	Total Capacity of Sewage treatment in MLD	Status of STP
1	Bhadravathi	CMC	5	5.83	Operational at present

3. Characteristics of River water quality:

The monitoring results of Bhadra River at downstream of Bhadravathi Town & Near Holehonnur for the year 2017 & 2018 are shown in **Table-2. River water quality conforms to Class D- means water is fit for propagation of wildlife and fisheries.**

3.1 Status of Water Quality

The details of parameter and specific concentration are provided in **Table-2**

Table-2 : Status of Water Quality of River - Bhadra

Year	Locations	DO (mg/L)		BOD(mg/L)		Fecal Coliform (MPN/100ml)		Total Coliform (MPN/100ml)		Class
		Min	Max	Min	Max	Min	Max	Min	Max	
2017	Near Holehonnur	6.6	8	2.5	3.8	900	30000	1400	90000	D

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	D/S of Bhadravathi City	6.2	7.2	3.0	4.6	5000	100000	9000	180000	D
2018	Near Holehonnur	6.8	7	2.8	4	1100	30000	2200	50000	D
	D/S of Bhadravathi City	6.8	7.2	3.0	5.2	3000	50000	5000	90000	D

The results indicate that the water is polluted due to sewage from Bhadravathi city.

4.Action taken by the KSPCB:-

CMC Bhadravathi has been informed to provide UGD and STP to the whole municipal area and to treat to the standards prescribed by the Board and to make use of the treated sewage for irrigation / secondary purposes. In this regard, they have been advised to submit action plan for the treatment of sewage and utilization of which includes solid waste management.

The Board Entrusted for a comprehensive study to EMPRI ,Bengaluru for conducting the quality & monitoring of water ,sewage,soil/sludge from Bhadra river stretch and study is in progress.

5. Actions plan to be taken for Rejuvenation of River water quality:

- The CMC Bhadravathi shall provide 100% UGD system to the entire town.
- The CMC Bhadravathi shall provide terminal sewage treatment plant to treat the sewage to the standards stipulated by the CPCB.
- The CMC Bhadravathi shall stop discharge of un-treated / treated sewage directly in to the river.
- Municipal solid wastes including poultry and slaughter house wastes shall be disposed only in MSW sites as per MSW guidelines and shall not be disposed on river banks.
- Vehicle washings and other activities shall be regulated.
- There shall not be discharge of sewage or sullage in to storm water drains. If any discharges are there same may be regulated by taking measures not to discharge into river.
- River cleaning and rejuvenation activities like sediments, weeds etc., shall be undertaken.
- Caution display boards at strategic points shall be displayed.
- Creation of buffer zones on either side of the river bank and developing green belt in that area.

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6.0. Cost component involved in the Restoration of Polluted stretch

Cost component shall be an integral part of Detailed Project Report (DPR). Most of the cities and towns are deficient in treatment of its total sewage generated. In order to cater each identified town on the bank of polluted river and gaps observed between total sewage generated and treatment capacity needs to be considered for planning.

Cost component shall invariably depend towards construction, operation and maintenance of sewage treatment plant. On an average Rupees 2.5 Crore has been estimated as Capital Cost per MLD (for primary, secondary and Tertiary treatment) excluding Operation and maintenance cost for all the available conventional and recent technologies. In some cities and towns developed capacity of STP is fully or partially underutilized due to inadequate sewerage network and other implementation issues.

Total estimated cost of **Rs.1.18 Crores should** be made budgetary provision as O&M for proposed new STP's/ Existing STP in the identified city/town along the Bhadra river.

Table -3: Cost Component involved in the Rejuvenation of Polluted Stretch of Bhadra

Sl. No.	Activity	Cost in Crores
		Bhadravathi City
1	Operation & maintenance (O&M) cost for existing STP per annum	0.38 Cr
2	O&M for proposed new STP's : (7.2 MLD WSP type STP & 1.00 MLD SBR type) construction completed	0.80 Cr
	Total Rupees	1.18 Crores

7. Status of Environmental Flow (E-Flow) :

The details of Flow (discharge) is provided in **Table-4**

Table-4 : Status of E-Flow of River - Bhadra

Year	Hydrological Observation Site	Flow (m ³ /s)	
		Min	Max
2016	Holehonnur	9.46	108.6
2017		10.979	103.1

8. Action Plan- Short Term and Long Term Action and the Identified Authorities for initiating actions and the time limits for ensuring compliance.

Short term and long term action plans and the implementing agencies responsible for execution of the action plans and the time limits are given in table as below :-

Sl. No	Action plan for rejuvenation of river Bhadra	Organisation/ Agency Responsible for Execution of the Action plan	Time Target
I.	Industrial Pollution Control		
	(a) Compliance of industries located in catchment area with respect to effluent discharge standards and its disposal as per consent conditions	KSPCB	Completed
	(b) Inventorisation of the industries in the catchment area of River Bhadra covering assessment on aspects relating to Status of Consents under Water & Air Acts and Authorisation, Effluent Generation, ETP capacities and final mode of effluent discharges	KSPCB	Not Applicable

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(c) Actions against the Identified industries in operation without Consents under Water & Air Acts/Authorisation under the H&OW (M & TM) Rules, 2016 as amended	KSPCB	Not Applicable
(d) Action against the industries not installed ETPs or ETPs exist but not operating or ETP outlet or treated effluent is not complying to the effluent discharge standards or norms	KSPCB	Not Applicable
(e)Action against the red category industries for installation of OCEMS and not transferring data to CPCB and KSPCB	KSPCB	Complied
(f) Small scale/tiny and service providing units located in urban or semi-urban limits like Dairies, Auto Service Stations to have minimum provision of O & G traps	Local bodies(Bhadravathi)/DMA	Within three months
(g)Prohibition of Burning of any kind of waste including agro-residues	State Govt./District Administration and Local bodies(Bhadravathi)and agriculture dept.	Within three months
(h) Directions to all the Industries which are observed to be not in operation or closed or temporarily closed to remain close till further orders from CPCB.	KSPCB	Within three months
(i) Estimation of industrial effluent generation and the existing CETP capacity and to arrive gap between the industrial effluentgeneration and the	KSPCB	Not Applicable

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	existing treatment capacity		
	(j) Channelization of industrial effluents to CETPs for ensuring treatment to comply with the discharge standards.	KSPCB and District Administration /Local bodies(Bhadravathi)	Not Applicable
	(k) Identification of suitable site within industrial estates, Execution and Commissioning of Adequate Capacity CETPs.	State Government , District/Local Administration /KIADB	Not Applicable
II.	Sewage Treatment and Disposal Plan		
	(a) District-wise estimation of total sewage generation, existing treatment capacities, quantum of disposal of sewage presently through drains and the gaps in sewage treatment capacity.	State Government, KUWS & DB, District Administration / Local bodies(Bhadravathi)	Within six months
	(b) To undertake measurement of flow of all the drains presently contributing pollution load in river Bhadra and to formulate detailed project report (DPR) for each drain and corresponding town and submission of DPR.	State Government, KUWS & DB, District Administration /Local bodies(Bhadravathi)	Within six months
	(c) Proper design, execution of STPs with full utilisation capacity	State Government, KUWS & DB, District/Local Administration	Within 15 months

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	(d) Channelization including diversion of sewage generated from household/townships/villages to sewer lines/interception of all the drains presently carrying sewage and for ensuring proper treatment through the upcoming STPs	State Government, KUWS & DB, District/Local Administration	Within 15 months
	(e) Ensuring dairy/automobile service stations and Hotels / Restaurants particularly located on road-side should have a treatment system and levy of fine in case found violations	Local authorities/DMA	Within three months
III	Ground water quality		
	(a) Sealing of contaminated hand pumps and found to be unfit for drinking purpose by the public	State Government, Karnataka rural drinking water and Sanitation Department and Local authorities	Contaminated ground water is not noticed
	(b) Supply of potable water to the affected communities in the identified critical blocks	State Government, Karnataka rural drinking water and Sanitation Department and Local authorities	Not Applicable
	(c) Carrying assessment of ground water survey for quality and to identify over exploited and critical blocks in the district. (Shivamogga)	Karnataka Ground Water Authority	Within Six months
	(d) To conduct periodic surprise inspection of the industry to rule out any forceful injection of industrial effluents into ground water resources	KSPCB/KGWA	Complied
	(e) All the industry should be directed to obtain NOC from the CGWB and action against the Units in Operation without obtaining of NOC from CGWA	KSPCB, CGWB/CGWA and Karnataka Ground Water Department	Within six months (The proposed new industries will be directed to obtain NOC from CGWA)

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(f) To ensure rain water harvesting by the industrial, commercial and other institutions and groundwater recharging with only clean water be encouraged by CGWB/CGWA	CGWA/ Karnataka Ground Water Department	Within six months
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IV	Flood Plain Zone (FPZ)		
	(a)Plantation in Flood Plain Zone (FPZ)	Karnataka State Forest Department	Within Six months
	(b)Checking encroachments in the FPZ of river Bhadra	District administration & Local bodies	Within Six months
	(c)Prohibition of disposal of municipal plastic and bio- medical waste particularly in drains	Local administration	Within Six month
	(d)Notification of Flood Plain Zone FPZ	State Government/water resources department	Within six Months
V	Environmental Flow (E-Flow) and Irrigation Practices		
	(a)Measurement of flow in the river and records maintained	Central water Commission/Karnataka Irrigation Department/Water Resources Department	Regularly (Daily/monthly)
	(b) To conserve water and good irrigation practices to be adopted by the farmers by organising mass awareness programmes and through media in vernacular language	Karnataka State Irrigation, water resources department and Agriculture Departments.	Once in six months
