

Proposed Action Plan for Rejuvenation of River Kali



Karnataka State Pollution Control Board

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INDEX

Sl. No.	Topic	Page No.
1	Introduction to Kali River	3-4
2	Sources of Pollution - Municipal Sewage generation and Treatment	5
3	Characteristics of River water quality	6
4	Action taken by the Board	6
5	Action to be taken for Rejuvenation of River Water Quality	6
6	Cost component involved in the Restoration of Polluted stretch	7
7	Status of Environmental Flow (E-Flow)	7-8
8	Short Term and Long Term Action and the Identified Authorities for initiating actions and the time limits for ensuring compliance	8-12

Proposed action plan for Rejuvenation of River Kali

- 09.** State : **Karnataka**
River Name: **Kali**
River Stretch : **Hasan Maad (west coast paper mill) to Bommanahalli Reservoir**
Priority : **IV (BOD 6-10 mg/L)**
BOD Max.value: **6.5 mg/L**
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1.The Kali river rises near Diggi, a small village in Joida taluk, Uttar Kannada district. The Kali River is flowing in part of 5 taluks out of 11 taluks through Uttara Kannada district of Karnataka State. The river is the lifeline to some four lakh peoples in the Uttara Kannada district and supports the livelihoods of thousands of people including fishermen on the coast of Karwar. There are many dams built across this river for the generation of electricity. Among them, the important dams build across Kali River is the Supa Dam at Ganeshgudi. The river runs in a stretch of 184 kilometers before joining Arabian Sea at Karwar.

1.1 Origin of Kali River:

The Kali River has its origin near the village of Kushavali of Joida Taluka in the Western Ghats and flows eastwards into the Supa Dam Reservoir, where it is joined by the Pandri River from the left (north). The Kali exits at Supa Dam near Kurandi then flows east towards Dandeli and passing south of Dandeli. The Kali River flows southeast into the Bommanalli Reservoir, exiting at the dam and flowing east between the villages of Kegdal on the right (south) and Bommanalli on the left (north). After the village of Bommanalli the Kali turns south and is join by the Tattihalla River from the left (west). At that point the Kali turns west and flows through a gorge which ends at Sathodi Falls below Sykes Point. The Kali is then joined by the Kaneri River from the right (north) and flows south-southwest into Kodasalli Reservoir. Leaving that reservoir, the Kali River flows west and is joined by the Vuki Halla from the right (north), when flows southwest into the Kadra Reservoir and it is joined by the Thana Halla just below the dam at Kadra. From Kadra the Kali flows west through marshland to join the Arabian Sea near the town of Karwar. **The total polluted stretch of the river is about 10 kms.**



Figure 1. The Kali River Stretch

2. Activities in Kali river stretch

1. The major towns located on bank of Kali river are Dandeli and Karwar towns. In most of the Kali river flow area, a dense forest is covered all along the stretch of Kali river.
2. On the Kali river stretch of Joida taluk and Dandeli area there are many Hospitality centres like Resorts and cottages established and operating, wherein water sports such as river rafting, Jacuzzi, Kayaking...etc are carried out and no boat engines are used in these activities.
3. In some stretches of Kali river agricultural activity on either side of River bank are carried out from the farmers. The major crops on either side of banks are Paddy, Sugarcane, Coconut, arecanut and végétale crops. The Agricultural run off may also joins the river throughout the stretch of the river in the district.
4. In Ambikanagar ,Ganeshgudi and Kadra Hydal power plants the Kali river water is used for generation of electricity from Hydal power and in Kaiga Nuclear power plant the Kali river water is used for cooling purpose in generating Electricity by nuclear power. The water used for these purposes is being dischrqed back in to Kali River.
5. Near Karwar town the sand bar removal in Kali river is permitted by the District task force commitee, Uttara Kannada district.

2.1 Entry of sewage in to the Kali river

1. The sewage from Dandeli town is directly enters in to Kali river along with run off through natural nala in different points without any treatment. **100% UGD has been provided for Dandeli CMC.**
2. The small quantities of sewage generated from the villages located on either sides of banks of river may also joins the Kali river.
3. The part of sewage generated from Karwar City is also enters in to Kali river in many different points without any treatment. **14% UGD has been provided for Karwar CMC.**

2.2 Entry of industries effluent in to Kali river :

1. M/s. The West Coast Paper Mills Pvt.Ltd., (WCPML) industry is the major large red (17 category) industry engaged in manufacturing of paper and duplex boards is located on left bank of Kali River near Dandeli Town. This industry is drawing the water for process from Kali River. The treated trade effluent from the industry which is conforming to the standards stipulated by the Board is being discharging to Kali River through a natural storm water nala namely Halmaddi nala, where it mix up with the untreated sewage generated from the Dandeli town and reaches the Kali river ner Dandelappa temple of Halmaddi area.
2. In Kaiga Nuclear power plant the Kali river water is being utilized for the cooling purpose. The outlet water from cooling towers has a temperature difference which inturn discharge into the Kali river.
3. There are no other major industries which are discharging effluent into the Kali river.

2.3. Municipal Sewage generation and Treatment

The Town wise sewage generation and treatment capacity Proposed for new STP is provided in **Table-1**

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

Sl No.	Name of the local body	Type	Total Sewage generation in MLD	Total Capacity of Sewage treatment in MLD	Status of STP
1	Dandeli	CMC	11.22	8.50	Proposed
2	Karwar	CMC	1.50	1.50	Operational at present

3. Characteristics of River water quality:

The monitoring results of Kali River at downstream of West Coast Paper Mills for the year 2017 & 2018 are shown in **Table-2**. River water quality conforms to Class C-Drinking Water Source with conventional treatment followed by disinfection for the year 2018.

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 - Kali

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	D/S of West Coast Paper Mills	6.8	7.6	2.3	6.5	35	550	140	1600	D
2018		6.9	8.2	2.7	3	130	350	550	1800	C

The result indicates that the water is polluted due to sewage from Karwar and Dandeli Cities.

4.Action taken by the Board:

1. M/s. West Coast Paper Mill Ltd., Dandeli is provided ETP to treat the effluent generated.
2. CMC- Karwar and Dandeli have been directed to provide Sewage Treatment Plant to treat the sewage generated from the towns.

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

1. The CMC Karwar shall take action to stop the discharge of Karwar domestic waste water in to the Kali River and to provide UGD facility for the Karwar Town and also to stop the open defecation on the banks of the River Kali.
2. River cleaning and rejuvenation activities shall have to be undertaken during the lean flow.
3. Creation of buffer zones on either side of the river bank have to be notified and developing green belt in that area.

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. **146.50 Crores** is already made budgetary provision by local bodies for UGD & operational and maintenance of Proposed STP in the identified cities i.e Dandeli along the Kali River and for remaining **Rs. 0.498 Crores** should be made budgetary provision for O&M cost of existing STP at Karwar.

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

Sl. No.	Activity	Cost in Rupees	
		Dandeli	Karwar
1	Operation & maintenance (O&M) cost for existing STP per annum	Not applicable	0.498 crores
2	Capital cost including O&M for proposed new STPs and UGD. Work is under progress.	146.50 Crores	Estimation is under process (for UGD facility 86% remaining area of the city karwar)
	Total Rupees	146.988 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 - Kali

Year	Hydrological Observation Site	Flow (m ³ /s)	
		Min	Max
2017	KPCL, Ganeshgudi supa dam	1105	2859
2018		695	4473

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

Shrot 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 Kali	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	Complied
	(b) Inventorisation of the industries in the catchment area of River Kali 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	Complied
	(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	Complied

ACTION PLAN FOR REJUVENATION OF RIVER Kali

	(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	Complied
	(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 Authorities(Dandeli, Karwar)/DMA	Within three months
	(g) Prohibition of Burning of any kind of waste including agro-residues	State Govt. / District Administration and Local Authorities (Dandeli, Karwar) and Agriculture Department	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 effluent generation and the existing treatment capacity	KSPCB	Not Applicable
	(j) Channelization of industrial effluents to CETPs for ensuring treatment to comply with the discharge standards.	KSPCB and District /Local Administration	Not Applicable

	(k) Identification of suitable site within industrial areas, Execution and Commissioning of Adequate Capacity CETPs.	State Government , District/Local Administration /KIADB	Not Applicabl
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 and local bodies (Dandeli, Karwar)	Within six months
	(b) To undertake measurement of flow of all the drains presently contributing pollution load in river Kali and to formulate detailed project report (DPR) for each drain and corresponding town and submission of DPR.	State Government, KUWS & DB, District Administration and local bodies (Dandeli, Karwar)	Within six months
	(c) Proper design, execution of STPs with full utilisation capacity	State Government, KUWS & DB, District/Local Administration	Within 24 months
	(d) Channelization including diversion of sewage generated from household/town ships/villages to sewer lines/interception of all the drains presently carrying sewage and for ensuring proper treatment through the upcoming	State Government, KUWS & DB, District/Local Administration	Within 24 months

	STPs		
	(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 (Uttara Kannada).	Karnataka Ground Water Authority	Complied
	(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)

(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	Complied
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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 Kali	District and Local administration	Within six Months
	(c)Prohibition of disposal of municipal plastic and bio- medical waste particularly in drains	Local administration	Within six Months
	(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/ 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 water resources department/Karnataka Irrigation Department/ Water Resources Department	Once in six months
