

**Action Plan for Rejuvenation of River Kosi,
Distt. US Nagar (Uttarakhand)
(River Stretch: Sultanpur Patti to Pattikalan)**

Priority-IV

Approved by

Uttarakhand River Rejuvenation Committee

June, 2019

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(Constituted in compliance of order of the Hon'ble N.G.T.)

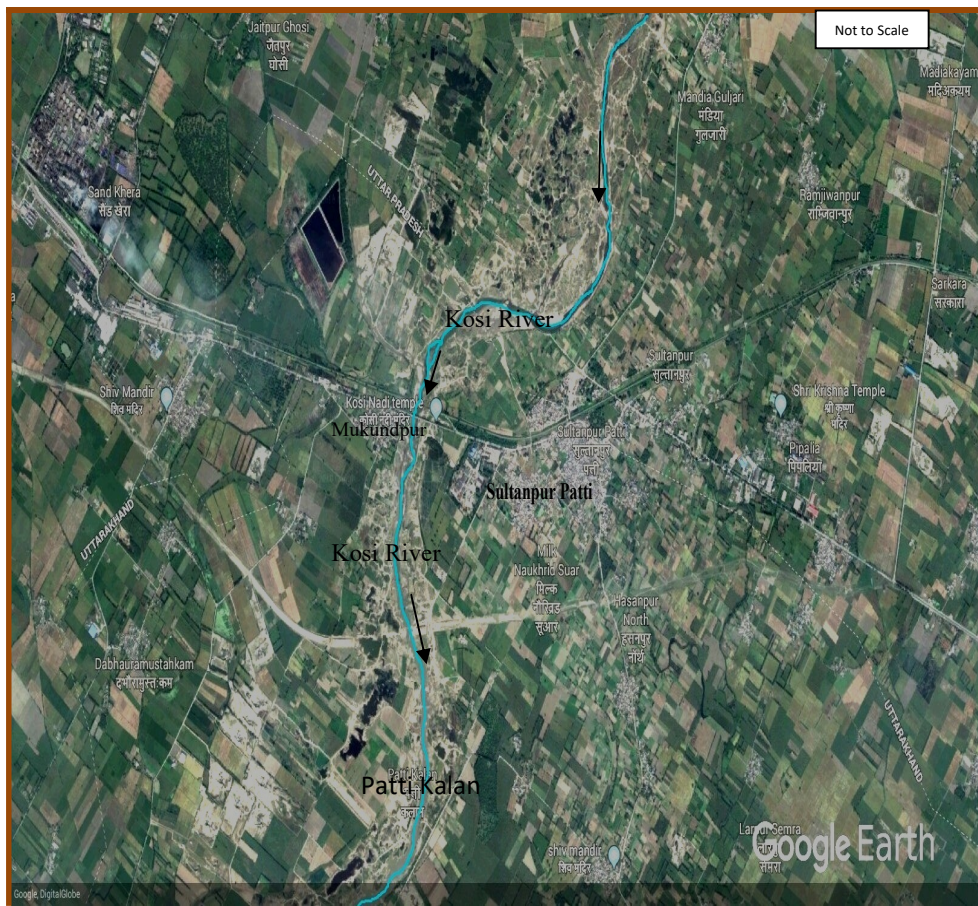
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1. INTRODUCTION

The Kosi originates in the middle Himalayas of Kumaon region of Uttarakhand. Kosi river is one of the few major Himalayan rivers that does not have a glacial source. Kosi is the main river of the district Almora and Nainital. River Kosi arising out of Koshimool near Kausani flows on the western side of the district, draining a fair share of Kumaon's abundant monsoons, leaving the hills at Ram Nagar. The Kosi is a perennial river like the Ramganga and its catchment lies partially in Corbett Tiger Reserve. From Mohan through Dhikuli till Ramnagar, the Kosi forms the eastern boundary of Jim Corbett National Park, where many hotels/resorts are located. Kosi river also provides drinking water for wild animals from Corbett Tiger Reserve. Ramnagar town is main urban settlement in the catchment of Kosi river. Barrage is prepared on river Kosi, where river water is diverted to irrigation and drinking purposes and therefore regulated water flow is maintain from downstream of barrage.



Google image of river Kosi along the Sultanpur Patti and Pattikalan. (Not to scale).

2. WATER QUALITY GOALS:

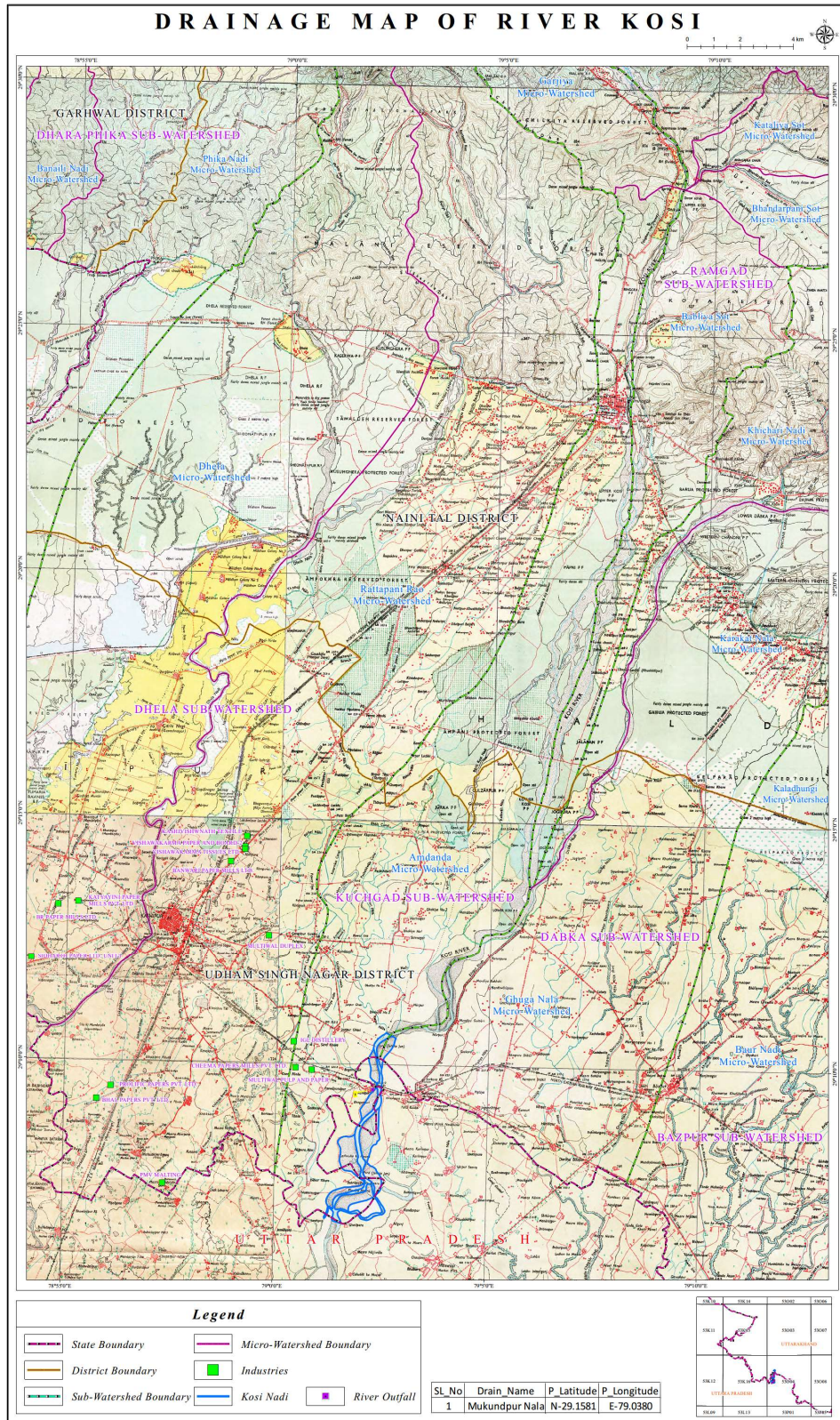
It is an important aspect for revival of river Kosi at identified polluted river stretch viz. Sultanpur Patti to Pattikalan in context of meeting water quality criteria for bathing. As stated above natural flow of river Kosi is restricted through *barrage at Ramnagar*, wherein river water is diverted for irrigation and drinking purposes, therefore after *Kosi barrage* only restricted river water flows in river Kosi. The said polluted river stretch receives wastewater water from pulp and paper industries through open channel parallel to National Highway and joins river Kosi at downstream of village Mukandpur.

Water Quality Characteristics of River Kosi:

River quality monitoring is being carried out by the Uttarakhand Environment Protection and Pollution Control Board at Bazpur Road, Kashipur. Data collected in the year 2018 are as given below:

Water quality characteristics of river Kosi at Bazpur Road, Kashipur in the year 2018.

Month	pH	BOD (mg/L)	COD (mg/L)	DO (mg/L)
Jan-18	7.1	4	14.2	7.2
Feb-18	7.3	2.2	14	7.8
Mar-18	6.8	6	18	6.4
Apr-18	7.48	14	38	4
May-18	7.3	12	32	5.2
Jun-18	7.3	10	28	6.4
Jul-18	7.4	4	12	6.8
Aug-18	7.2	3.2	10	7.2
Sep-18	6.9	3.4	12	7.2
Oct-18	7.2	3.2	10	6.8
Nov-18	7.1	4.8	12	6.6
Dec-18	7.5	2.4	10	7.6
Average	7.21	5.76	17.51	6.6
Min-Max	(6.8-7.5)	(2.2-12)	(10-38)	(4-7.8)



Basis of Proposed Action Plan for rejuvenation of river Kosi between Sultanpur to Pattikalan:

As River Kosi receives industrial wastewater from pulp & Paper industries between identified polluted river stretch, therefore it is imperative to keep close watch on those mills along with other small scales commercial activities if any along the said course. Action plan for prevention and control of pollution of river Kosi between Sultanpur to Pattikalan has been prepared based on the following components:

3. IDENTIFICATION OF SOURCE OF POLLUTION:

The proposed action plan for rejuvenation of river Kosi consisting following components:

3.1 Source Control:

Source control includes industrial pollution control and treatment and disposal of domestic sewage as detailed below:

(a) Industrial Pollution control:

- i. Identification of pollution potential industries.
- ii. Sector specific categorization of industries.
- iii. Assessment of Water consumption and wastewater discharge and gap in treatment of industrial effluent.
- iv. Provision of wastewater treatment system.
- v. Regulatory regime including "Charter for Prevention and Control of Pollution on Pulp and Paper Industries- 2015".

(b) Sewage Management:

- i. Estimation of quantity of sewage generated and requirement of treatment capacity.
- ii. Gap analysis in terms of sewage generation, existing installed treatment capacity and required treatment capacity.
- iii. Identification of municipal drains & their discharge in the catchment of river Bhela.
- iv. Interception and diversion of municipal drains to STP.

- v. Treatment and disposal of septage and controlling open defecation.

(c) Solid Waste Management:

- i. Implementation of Door-to-Door collection.
- ii. Source segregation as biodegradable and non-biodegradable wastes.
- iii. Identification of suitable site for setting up common waste processing and secure landfill facility.
- iv. Transportation, disposal and treatment facilities of municipal solid wastes generated from town in accordance of provisions of the Solid Waste Management Rules, 2016.
- v. Restriction illegal disposal of solid waste along the river bank and flood plain zones.
- vi. Prohibition on burning of solid wastes.
- vii. Implementation of Construction and Demolition Wastes Management Rules.

3.2 Groundwater Water Quality:

- i. Periodic groundwater quality assessment at strategic locations.

3.3 Flood Plain Zone.

- i. Flood plain zoning.

3.4 Ecological/Environmental Flow (E-Flow)

- i. Maintaining E-Flow.

4. RIVER KOSI REJUVENATION PLAN:

Following are the action plan for rejuvenation of river Kosi (Sultanpur Patti to Patti Kalan) as detailed below:

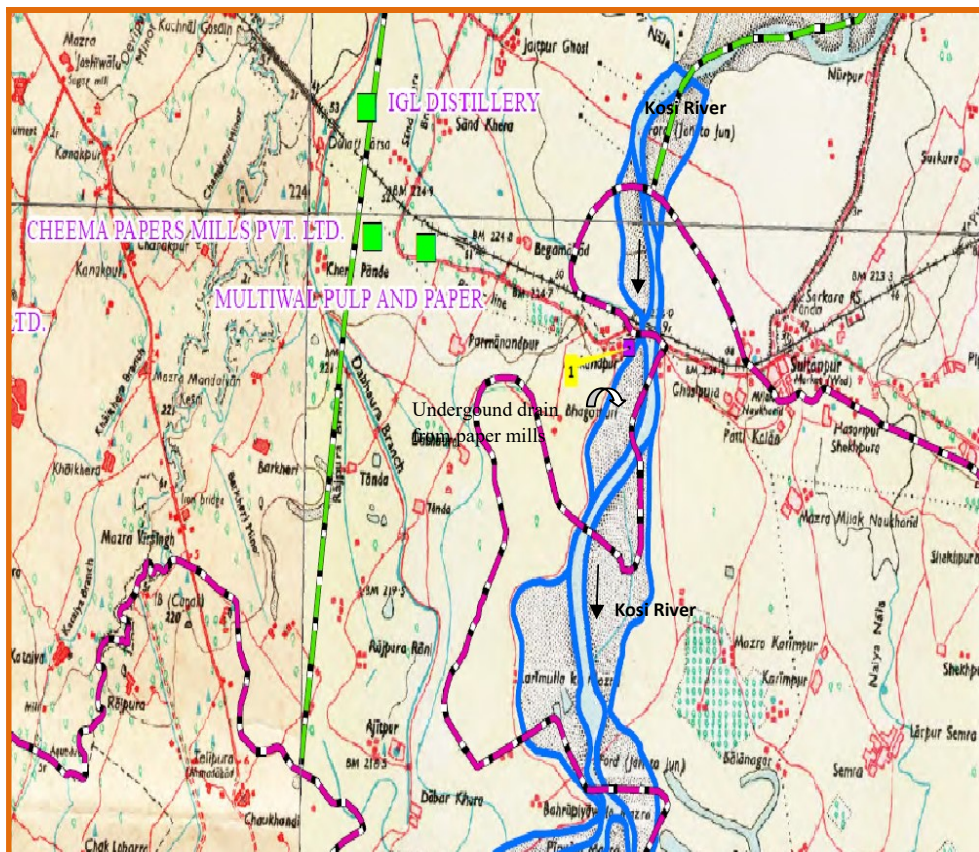
4.1 Industrial Effluent Management:

The UEPPCB is vigil on operation of effluent treatment plants particularly in grossly polluting industries (GPIs) and other red categories of water polluting industries. There are 02 GPIs (waste

paper based pulp and paper industries) are operating in the catchment of river Kosi. Details of above two GPIs are given as below:

SN	Industry Name	Water Consumption (KLD)	Wastewater Generation (KLD)	Status of Treatment Plant
1	Cheema Paper Ltd, 9- Km,Stone, Bazpur Road, Kashipur	3530	2649	Operational ETP
2	Multiwal Pulp & Board Mills (P) Ltd., 9th . Km. Stone, Bazpur Road, Kashipur	3250	1230	Operational ETP

Treated wastewater of above two wastepaper based pulp and paper industries runs parallel through open channel to the national highway and thereafter passes through underground drain and joins river Kosi at downstream of village Mukanpur.



GPIs are being monitored in every quarter apart from other surprise inspection. Online effluent monitoring systems have also been provided at effluent outlet and real time data are being transmitted to Central Pollution Control Board and UEPPCB. Provisions of “Charter-2015” are being strictly being implemented in pulp and paper industries. Agro-based pulp and paper mills are allowed to operate only with Chemical Recovery Plant (CRP) with Zero Black Liquid Discharge.

There are one industrial drain coming towards river Kosi from industries at joining at downstream of village Mukandpur. Drain carries about 3879 KLD wastewater from above said two GPIs.

Environmental Surveillance Squad (ESS) also formed at head office level in order to make surprise inspection. Strengthening of ESS will be carried out for effective surveillance.

Industrial hazardous waste management: Recyclable hazardous wastes, mainly used oil /contaminated barrels are being recycled through registered recyclers, while landfillable waste is being disposed thorough M/S Bharat Oil and Waste Management Pvt. Ltd. located at Laksar, Distt. Hardiwar with an installed capacity of 667 MT/month landfill. Incinerable waste is either disposed through common incinerator of 1000 MT/month incineration capacity or through co-processing in cement kilns.

4.2 Sewage Management:

The Uttarakhand Peyjal Nigam has identified Mukundpur Nala which flows towards river Kosi for interception and diversion and establishment of Sewage treatment plant. Detail of mukundpur drain is as follow:

1. Discharge measurement of Mukundpur drain:

Name of drain	Present average discharge (KLD)	Design year (2031) discharge (KLD)
Mukundpur Nala	86.94	104.89

2. Proposed Interception and Diversion of Mukundpur Nala and construction of Sewage Treatment Plant:

SN	Description	Total Rs. (Lacs)
1	I&D and S.T.P. Capital Works	
i	I&D work and STP work	283.28
ii	Sewage Pumping Station	46.86
iii	Transmission Line	13.51
	Total Capital Cost	343.65
2	O&M Works for 15 Years	
i	I&D, SPS & Sewage Treatment Plant	121.86
	Total	121.86
3	Land Acquisition for S.T.P. and I&D works	20.00
4	Project preparation and supervision 8% as per norms	26.41
	Grand Total	511.92

Total estimated cost of above proposed activities is: **Rs. 511.92 Lacs** say **Rs. 512.00 Lacs**.

Time line: Proposal has been submitted to the State Government for allocation of funds. Proposed activities will be completed within two years from sanction and release of funds.

4.3 Solid Waste Treatment:

Nagar Panchayat, Sultanpur Patti is a statutory urban local body responsible for management of solid wastes as per provisions of Solid Waste Management Rules, 2016 as amended. The population of Sultanput Patti is 9881 as per census of 2011. Nagar Nigam is divided into 7 wards. Partial door to door collection is being undertaken. Nagar Panchayat has approved Bye Laws for user charges and implemented. It is proposed that collected solid waste from panchayat will be processes and treated through proposed common facility of Gadarpur Cluster. Detailed Project Report (DPR) is being prepared and it is estimated that about Rs. 613 Lacs would be required for development of waste processing and disposal facility for Gadarpur cluster.

Nagar Panchayat, Sultanpur Patti:	
Total Population	9881 (as per 2011 census)
No. of municipal wards	07
Total waste generation	2.95 MTPD
Door to Door collection	05 wards
Bye Laws for user charges	Approved and being implemented.
Realization of user charges	~ Rs. 1.25 Laks per month.
Identification of land for waste processing and disposal facility	Land identified for Gadarpur cluster where solid waste of Nagar Panchayat will be processed and disposed of. DPR is under preparation. It is estimated that about Rs. 613 .00 Lacs would be required for the same.

Total estimated cost for setting up solid waste processing and disposal facility is Approx. **Rs. 613.00 Laks.**

Time Line: Proposal for solid waste processing and disposal facility will be submitted to the State Government for allocation of funds. Two year time would be required after sanction of funds.

Construction and Demolition waste shall be disposed in river bed or road side. Necessary directions have already been issued to concerned local body for identification of site.

4.4 Ground Water Quality:

So far contamination of groundwater is not reported in the area, however groundwater quality monitoring shall be carried out at least twice in the year (winter: December-January and summer: May-June) at strategic locations to ascertain quality of groundwater.

4.5 Flood Plan Zone (FPZ):

The Department of Irrigation has prepared for flood plain zoning of rivers Gola (along Kichha town) and Kosi (from Sultanpur Patti to Patti Kalan) in the year 2017. Approximate cost of proposal is Rs. 72.89 Lacs and which would be completed within 18 months after approval of the same.

4.6 Environmental Flow (E-Flow):

River Kosi carrying restricted flow during non-monsoon period as barrage is constructed at Ramnagar from where river water is diverted irrigation uses. Wastewater from industries increases the flow of river; therefore, it would be difficult to maintain natural flow in the river.

4.7 Monitoring of Action Plan:

The proposed Action Plan will be monitored by the River Rejuvenation Committee (RRC) constituted by Government of Uttarakhand vide Office order dated 05.12.2018, under the overall supervision and co-ordination of Principal Secretary, Forest & Environment, Govt. of Uttarakhand.

5 ACTION PLAN:

Identified activities and concerned authorities for initiating actions and the time limits and budgetary requirements:

SN	Action plan for rejuvenation of river Kosi	Organisation/ Agency Responsible for Execution of the Action Plan	Time Target	Budgetary Requirement (Rs. In Lacs)	Remarks
1. Industrial Effluent Management:					
a)	Routine /surprise inspection GPs and Red category of industries for ensuring compliance of effluent discharge standards as prescribed under E (P) Rules, 1986, as amended.	Special Environmental Surveillance Task Force / UEPPCB	One month	Nil	Continuous activity.
b)	Strengthening of Environment Surveillance Squad (ESS) of UEPPCB	UEPPCB	Three month	Nil	Continuous activity.
c)	Monitoring of drains carrying industrial wastewater.	UEPPCB	Two month.	Nil	Continuous activity.
2. Sewage Management:					
a)	Interception and diversion of Mukundpur Nala	Uttarakhand Peyjal Jal Nigam	Two year from sanction of funds.	512.00	Proposed activities will be completed in two years from sanction and release of funds.
b)	Installation of STP of 110 KLD capacity at Mukundpur	Uttarakhand Peyjal Jal Nigam			
c)	Operation and Maintenance of STP for 15 years; Operation and Maintenance of I&D Works for 15 years; Land acquisition etc. expenses	Uttarakhand Peyjal Jal Nigam			
3. Solid Waste Management:					
a)	Door to door collection of solid waste in all 40	Nagar Panchayat,	October, 2019	613.00	DPR of Gadarpur

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	wards of town.	Sultanpur Patti			cluster will be submitted to the State Govt. For allocation of funds.
b)	Source segregation of wastes in all 40 wards of town.	Nagar Panchayat, Sultanpur Patti	April, 2020		
c)	Setting up solid waste processing facilities.	Nagar Panchayat, Sultanpur Patti	Two years from sanction of funds.		
4. Groundwater Quality					
a)	Groundwater quality monitoring at during summer (May-June) and winter (December-January).	UEPPCB	Two months.	-	-
5. Flood Plain Zone:					
a)	Flood plain zoning of Rivers Gola (along Kichha town) and Kosi (from Sultanpur Patti to Patti Kalan).	Irrigation Department	18 months	72.89	Flood plain zoning will be done within 18 months after approval of Govt..
6. Environmental Flow:					
a)	River Kosi is spring fed perennial water body and apart from monsoon months there is very less natural water flows in the identified polluted stretch as river water is restricted at Kosi Barrage at Ramnagar. Therefore, it would not be possible to maintain e-flow in identified river stretch.				
