Action Plan for Rejuvenation of

RIVER KICHHA

Kichha, Distt. Udham Singh Nagar, Uttarakhand

(River Stretch: Along Kichha)

Priority - II

Approved by

Uttarakhand River Rejuvenation Committee

(Constituted in compliance of order of the Hon'ble National Green Tribunal)

Submitted to

Central Pollution Control Board, Delhi

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Action Plan: 4

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Executive Summary

River Gola River, is originating in the Lesser Himalayas of Kumaun hills and flows through Kathgodam, Haldwani and Kichha town. Gola river is known as Kichha river in its lower course from Kichha. Passing along the Kichha town, it finally joining the Ramganga River about 15 km northwest of Bareilly in Uttar Pradesh.. Gola river is a spring fed river and is a main source of drinking and irrigation water for Haldwani. Barrage has been constructed at Kathgodam to divert river water for drinking and irrigation purposes. Downstream of barrage, the river is almost dry except monsoon months while river flow appears in downstream. Kichha is a major urban settlement located along the river. Apart from urban habitation, there are eleven villages are also located along the Kichha river.

River Kichha receives significant volume of industrial wastewater from Century Pulp and Paper, Lalkuan located about 18Km upstream through Poha drain. River Kichha also get agricultural wash off, municipal wastewater drains from Kichha town. There are six major municipal drains namely, which finally merges into Kichha river.

Based on water quality data for the years 2016 and 2017, River Kichha along the Kichha town (approximately 6 Km.) has been identified as polluted river stretch by the Central Pollution Control Board (CPCB) because of high concentration of BOD i.e. >25mg/L.

In pursuance to Hon'ble National Green Tribunal order dated 20.09.2018, 19.12.2018 and 08.04.2019, action plan has been prepared for restoration of polluted river stretch along the Kichha town of River Kichha.

In order to improve river water quality, proposed activities are interception, diversion and treatment of municipal drains, solid waste processing and disposal facility for Kichha town, surveillance of water polluting industries and drains carrying industrial wastewater, prohibition on illegal disposal of waste in river beds, groundwater quality monitoring and recharge of groundwater, plantation in catchment etc. About Rs. 1692.89 Lakhs would be required for interception, diversion and treatment of municipal drains; establishment of solid waste processing and disposal facility and other activities.

1. INTRODUCTION

River Gola River, is originating in the Lesser Himalayas of Kumaun hills and flows through Kathgodam, Haldwani and Kichha town. Gola river is known as Kichha river in its lower course from Kichha. Passing along the Kichha town, it finally joining the Ramganga River about 15 km northwest of Bareilly in Uttar Pradesh. Gola river is a spring fed river and is a main source of drinking and irrigation water for Haldwani. Barrage has been constructed at Kathgodam to divert river water for drinking and irrigation purposes. Downstream of barrage, the river is almost dry except monsoon months while river flow appears in downstream.

Major town/villages in the catchment of river Kichha:

Kichha is a major urban settlement located along the catchment. Population of Kichha town is 41965 (as per 2011 census). Apart from urban habitation, there are eleven villages namely – Bakhpur, Lakshmipur, Kanman, Dhada, Najeembhad, Katra Gaughat, Chachar, Siroli Khurd, Satuiya, Khamiya -3 and Khamiya-4 are also located along the Kichha river.

Major Industrial pockets in the catchment of river Kichha:

River Kichha receives significant volume of industrial wastewater from M/S Century Pulp and Paper, Lalkuan located about 18Km upstream through Poha drain, having paper production capacity of writing & Printing Paper-17600 Tonnes/Month and Tissue Paper-3000 Tonnes/Month. River Kichha also get agricultural wash off, municipal wastewater drains from Kichha town and wastewater from sugar mill located in the area.

Major drains contributing sewage in the river Kichha:

There are six major drains namely – Bedi Mohall Ward No. 6 Nala, Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-I, Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-II, Purani Mandi Wala

Nala-I, Purani Mandi Wala Nala-II and Shiv Magar Mandi Wala Nala, which finally merging into Kichha river.

Based on water quality data for the years 2016 and 2017, River Kichha along the Kichha town (approximately 6 Km.) has been identified as polluted river stretch by the Central Pollution Control Board (CPCB) because of high concentration of BOD i.e. >25mg/L.

In pursuance to Hon'ble National Green Tribunal order dated 20.09.2018, 19.12.2018 and 08.04.2019, action plan has been prepared for restoration of polluted river stretch from Kashipur to Gheruwala Thakurdwara of River Kichha.

2. WATER QUALITY GOALS:

It is an important aspect for restoration of river Kichha in context of meeting water quality for designated uses. It is pertinent to mention that because of low natural flowing water during most of the time, even if the industries located in the catchment meet the prescribed discharge norms as stipulated under the Environment (Protection) Rules, 1986, it would not be possible to achieve river water quality of Class 'B'. Effort would be made to improve in river water quality Class by prevention and control measures. However, goals can be met for Class 'E' i.e., for irrigation, industrial cooling and controlled waste disposal.

Sl. No	Drain Name	Longitude	Latitude
1	Drain No. 1 (Bedi/Mohalla Ward No. -6)	79° 31' 34.000" E	28° 54' 07.000" N
2	Maharana Pratap Chowk se Khatima kiaurjaincwala Nala I	79° 31' 34.454" E	28° 54' 21.486" N
3	Maharana Pratap Chowk se Khatima kiaurjaincwala Nala II	79° 31' 35.000" E	28° 54' 21.000" N
4	Near Bankhandi Mandir Ward no.-17, / Purani Mandiwala Nala I	79° 31' 29.335" E	28° 54' 34.520" N
5	Near Bankhandi Mandir Ward no. 17, / Purani Mandiwala Nala II	79° 31' 26.906" E	28° 54' 35.263" N
6	Shivnagar Mandiwala Nala, Ward No. 17	79° 31' 26.312" E	28° 54' 39.249" N

Fig.: Drainage map of River Kichha.

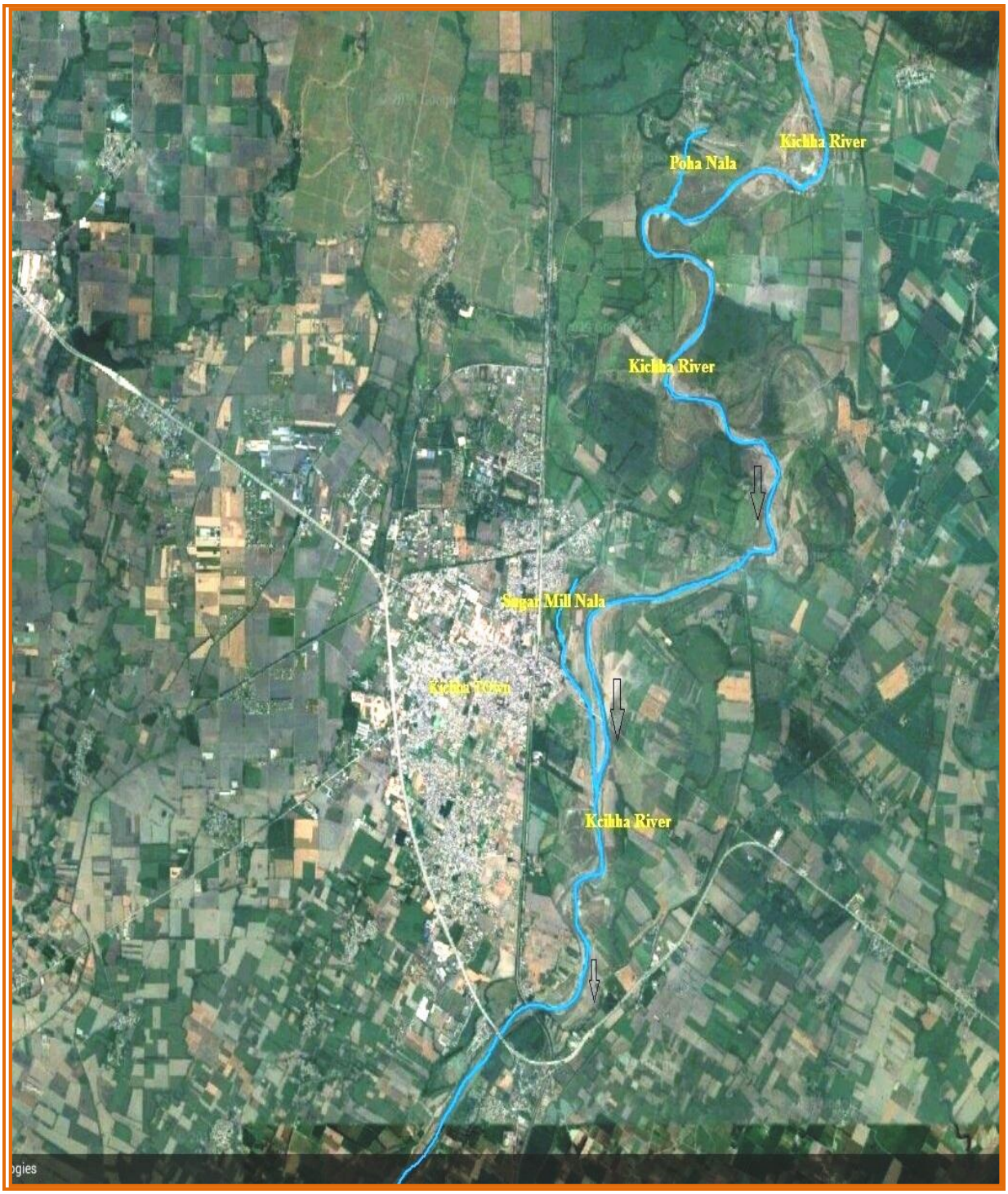

Fig: Google map showing Kichha town along with Kichha river and drains carrying industrial wastewater.

3. WATER QUALITY CHARACTERISTICS OF RIVER KICHHA AND DRAIN CARRYING INDUSTRIAL WASTEWATER:

River quality monitoring is being carried out the Uttarakhand Environment Protection and Pollution Control Board at downstream of Kichha town, near bypass bridge. Data collected in the year 2018 and 2019 (up to May, 2019) are as given blow:

A. Water quality characteristics of river Kichha at downstream of Kichha Town (near bypass bridge) in the year 2018 and 2019 (up to May, 2019).

Month	pH	D.O. (mg/L)	B.O.D. (mg/L)	C.O.D. (mg/L)
Jan-18	8.10	4.80	8.0	46
Feb-18	8.0	4.40	18.0	66
Mar-18	7.42	6.60	6.0	58
Apr-18	7.54	0.40	38.0	140
May-18	7.6	2.0	28.0	88
Jun-18	7.4	2.6	22.0	80
Jul-18	7.5	3.2	18.0	70
Aug-18	7.7	4.6	12.0	44
Sep-18	7.6	4.4	10.2	38
Oct-18	7.7	4	12.0	46
Nov-18	7.4	4.2	14.2	46
Dec-18	7.8	6.2	12.0	30
Average (Range)	**7.65** (7.4-8.10)	**3.95** (0.40-6.60)	**16.53** (6-38)	**62.67** (30-140)

Month	pH	D.O. (mg/L)	B.O.D. (mg/L)	C.O.D. (mg/L)
Jan-19	7.3	6.4	10	28
Feb-19	7.6	6.4	12	26
Mar-19	7.7	4.4	6.8	22
Apr-19	7.4	4.2	8	40
May-19	7.2	4.8	7.2	36

B. Water quality of Poha nala contributing industrial wastewater to river Kichha.

Wastewater analysis of Poha Nala was carried out in the month of July, 2019. Sugar Mill was not in operation due to off season, therefore sample could not collected. Wastewater characteristics of Poha Nala is as given below:

S.N.	Name of the Drain	Flow in Cub. M/Sec.	Characteristics (Values are in mg/l except pH and Fecal Coliform)									
			pH	BOD mg/l	COD mg/l	Zn mg/l	Cr mg/l (Total)	Cd mg/l	Ni mg/l	Fe mg/l	As mg/l	FC (MPN/ 100 ml)
1.	Poha Nala	1.234	7.19	41	160	BDL	BDL	BDL	0.03	2.53	BDL	100

D. Ground water quality in the catchment of river Kichha:

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. IDENTIFICATION OF SOURCE OF POLLUTION:

Major source of pollution in river Kichha are:

i. Sewage / municipal drainage from the Kichha town.
ii. Industrial effluent from the industrial located nearby areas.
iii. Improper disposal of solid waste.
iv. Agricultural runoff.

Following components have identified for preparation of action plan for rejuvenation of river in compliance to the Hon'ble NGT Orders 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.

5. GAP ANALYSIS:

5.1 Sewage Management:

Kichha is a major town located in catchment of River Kichha. Detail of sewage generation of Kichha town is detailed below:-

1.	Major Town in the catchment area of River Bhela	Kichha
2.	Population (as per census, 2011)	74356
3.	Expected Population (2035) (with2% floating population)	134834
4.	Water Consumption in litres per capita per day (118 lpcd) with 20 % margin for GW consumption i.e., 141.6 Lit/head /day	19092.5 KLD
5.	Total Sewage generation in KLD (in 2035)	15.274 MLD
6.	Existing STP nos/Septic tanks	STPs: Nil
		Captive Septic Tanks : All houses
7.	Total sewage treatment capacity through STPs/Septic Tanks	STPs : Nil
		Captive Septic Tanks: Individual households.
8.	Gap in Sewage Treatment	100%

Sewage generation of Kashipur town is about 15.274 MLD. Septic tanks have been made by individual households for disposal of sewage and supernatant is directly or indirectly disposed of in nearby drains which ultimately join six major drains, namely – Bedi Mohall Ward No. 6 Nala, Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-I, Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-II, Purani Mandi Wala Nala-I, Purani Mandi Wala Nala-II and Shiv Magar Mandi Wala Nala, which finally merging into Kichha river. Details of drain are given below:

Discharge and BOD concentration of identified drains:

SN	Name of drain	Discharge (MLD)	BOD (mg/L)
1.	Bedi Mohall Ward No. 6 Nala	0.23	36
2.	Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-I	0.05	48
3.	Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-II	0.17	
4.	Purani Mandi Wala Nala-I	0.09	36
5.	Purani Mandi Wala Nala-II	0.12	
6.	Shiv Magar Mandi Wala Nala	0.32	42

5.2 Industrial Effluent Management:

There are four grossly polluting industries (GPIs) are operating in Kichha river catchment .The UEPPCB is vigilant on operation of effluent treatment plants particularly in GPIs and other red categories of water polluting industries. Details of GPIs are given as below:

SN	Industry	Water Consumption (KLD)	Wastewater Generation (KLD)	Status of Treatment Plant	Capacity of ETP (KLD)	Gap (4)-(6)	Final mode of disposal of effluent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Century Pulp & Paper, (Unit-1),Ghanshyamdham, Lalkuan.	25000	22500	Individual Captive ETP	40000	Nil	Poha Nala
2.	Century Pulp & Paper, (Unit-2),Ghanshyamdham, Lalkuan.	7000	ZLD (Treated water is recycled in Unit 1 & 2)	Individual ETP	6000	Nil	Poha Nala
3.	Century Pulp And Paper, (Unit-3),Ghanshyamdham,	25000	25000	Individual ETP	40000	Nil	Poha Nala

	Lalkuan.						
4.	Kichha Sugar Company Ltd., Kichha.	1066	703	ETP	1600	Nil	Drain leading to Kichha river

It is estimated that about 58066 KLD water is consumed and about 48203 KLD wastewater is generated by above listed 4-GPIs located in the river Kichha catchment. Wastewater so generated is directly or indirectly coming into river Kichha through drains. Individual industries have provided appropriate capacity effluent treatment plant for treatment of process wastewater in order to meet prescribed discharge norms.

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.

Poha nala is carrying wastewater from pulp and paper mills located in upstream and passing through Shantipur area and ultimately joins river Kichha at upstream of Kichha.

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.

5.3 Industrial hazardous waste management:

About 112.16 MTA hazardous waste is generated from the industries located in the catchment. Out of which 101.660 MTA is ETP sludge from paper mills which is being used for board making. 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 and 1000 MT/month incineration capacity.

5.4 Solid Waste Treatment:

Nagar Palika Parisad, Kichha is statuary body responsible for management of solid wastes as per provisions of Solid Waste Management Rules, 2016 as amended. The population of Kashipur town is 74356 as per census of 2011. Nagar Palika Parisad is divided into 20 wards. Door to door collection is being undertaken in all 20 wards. Nagar Palika Parisad has approved Bye Laws for user charges and implemented. Kichha town is covered under Haldwani cluster and solid waste processing and disposal shall be done Haldwani cluster. For haldwani cluster land has been identified and necessary clearances have been obtained. RFP has been floated for development of waste processing and disposal facility.

In case of villages located in the Kichha river catchment, following activities are being carried out under Swach Bharat Mission- Rural:

Solid-Liquid Waste Management related works carrying out in Gram Panchayats under Swachh Bahrat Mission (Gramin):	
A. Liquid Waste Management	Construction of PVC/CC Drains & Individual / Community Soak pits.
B. Solid Waste Management	Establishment of Segregation Centre, individual dustbins, Community Garbage Pits, Individual Biogas plant and Vermi compost/NEDEP Compost Pit.
C. Social/ HRD activities	Swachhata Abhiyan, banned open Defecations, Plastic Banning Awareness, Personal/Domestic/environmental sanitation Awareness. Trainings for GP represented/ Swachhata Grahi, Rallies, awareness campaign etc.

Plastic Waste: Segregation of waste is being carried out in all 20 wards by Nagar Palika Parisad, Kichha. Segregated plastic wastes is disposed through recycling units.

A total of 30 plastic waste recycling units are registered with Uttarakhand Environment Protection and Pollution Control Board. Installed capacity of these plastic recycling units is 135259.44 MTA. As per annual return of 18

Recycling units, 99289.74 MTA plastic wastes have been recycled in the year 2018-19.

5.5 Bio-medical Waste Management:

About 19 Health Care Facilities (HCFs) are operating in Kichha town. It is estimated that about 14.662 Kg/day biomedical waste is generated from these healthcare facilities. Common Bio-medical Waste Treatment Facility (CBMWTF) is located at Lambakheda, Gadarpur. Most of HCFs are contributing their waste to CBMWTF for treatment and disposal.

5.6 Groundwater Quality Monitoring:

Groundwater quality monitoring at two locations is being carried out at Kichha river catchment area on half yearly basis, for basic and core parameters. Assessment of heavy metals and pesticides will be carried out along with basic and core parameters.

6. RIVER BHELA REJUVENATION PLAN:

Identified activities with time limits and budgetary requirements are given as below:

6.1 Proposed Interception and Diversion of municipal drains and construction of Sewage Treatment Plant:

Existing	Proposed	No. of I&D activity	Cost (Rs. in Laks)
Interception and Diversion of drains:			
Nil	Bedi Mohall Nala	1 No.	3.22
	Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-I	1 No.	
Nil	Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-II	1 No.	
	Purani Mandi Wala Nala-I	1 No.	

	Purani Mandi Wala Nala-II	1 No.	
	Shiv Magar Mandi Wala Nala	1 No.	
Sewer line from 6-drains to Sewage Pumping Stations (SPS):			
Nil	DI-K-7 150 mm dia; 200 mm dia and 250 mm dia		35.25
Sewage Pumping Station (SPS)			
Nil	Receiving chamber; Course Screen Channels, Raw Sewage Sump; Pump house on top of Sump		64.12
Rising Main from SPS to proposed STPs			
Nil	DI-K-7 250 mm dia		5.60
Sewage Treatment Plant			
Nil	2-MLD capacity (1 No.)		560.00
Miscellaneous works			12.41
Land Acquisition			30.820
		Sub Total	**711.40**
O&M Works (Civil)			233.10
E&M Works including O&M			622.89
		Sub Total	**1567.39**
Centage charges @ 8% as per norms			52.55
		Total Cost	**1619.94**
		Say	**1620.00**

Total estimated cost of above proposed activities is: **Rs. 1619.94 Lahks say Rs. 1620.00 Lakhs.**

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

6.2 Solid Waste Treatment:

Nagar Palika Parisad, Kichha is statuary body responsible for management of solid wastes as per provisions of Solid Waste Management Rules, 2016 as amended. Nagar Palika Parisad is divided into 20 wards. Door to door collection is being undertaken in all 20 wards. Kichha town is covered under Haldwani cluster and solid waste processing and disposal shall be done Haldwani site. For haldwani cluster land has been identified and necessary clearances have been

obtained. RFP has been floated for development of waste processing and disposal facility. Revised cost of Solid waste processing and disposal facility of Haldwani Cluster is **Rs. 1905.00 Lakhs**.

6.3 Flood Plan Zone (FPZ):

The Uttarakhand Irrigation Department carried out an assessment of flood plain zoning of river Kichha and proposal has been submitted to the State Government for approval. Flood plain zoning shall be carried out within 18 months of approval for the same. Encroachments along the banks of river if any will be removed. Illegal dumping of waste etc. will be removed from flood plain areas.

6.4 Environmental Flow (E-Flow) and Ground Water Recharge Measures:

River Kichha carrying no natural water during non-monsoon period as river water is diverted to drinking and irrigation uses from Kathgodam-Haldwani. Wastewater from industries increases the flow of river. Therefore, it is not difficult to maintain E- flow in the river Kichha.

However, provision for additional water storage in the form of artificial ponds and lakes wherever feasible will be taken care and same will be allowed to discharge in the Kichha. Construction of artificial lakes and ponds also help in ground water recharge.

All the government offices will be directed to create a provision of roof top rain water harvesting provision in their buildings for ensuring ground water recharge in the catchment of river Kichha.

6.5 Greenery Development:

Adjacent to the banks of river Kichha, green coverage, wherever feasible will be developed with the help of forest department.

6.6 Utilisation of treated sewage:

Treated sewage will be utilised for irrigation or agricultural or industrial cooling or construction activities purposes once the STPs become operational in the catchment of river Kichha Treated water channel may also linked with irrigation network in order to reduce ground water consumption for irrigation uses.

6.7 Monitoring of Action Plan:

The proposed Action Plans 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. CPCB experts also be invited for the RRC review meetings for taking feedback and suggestions.

7. ACTION PLAN:

Short Term and Long Term Action and the Identified Authorities for initiating actions and the time limits for ensuring compliance:

S. N.	Action plan for rejuvenation of river Kichha	Organisation/ Agency Responsible for Execution of the Action Plan	Time Target	Budgetary Requirement (Rs. In Lakhs)	Remarks
1. Industrial Effluent Management:					
a)	Routine /surprise inspection GPIs 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	Two months	Nil	Continuous activity.
c)	Monitoring of drains carrying industrial wastewater.	UEPPCB	Complied (July, 2019 onwards).	Nil	Continuous activity.
2. Sewage Management:					
a)	Interception and diversion of 6- drains namely - Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-I; Maharana Pratap Chowk se Khatima Ki Aur Janey wala Nala-II; Purani Mandi Wala Nala-I; Purani Mandi Wala Nala-II; and Shiv Magar Mandi Wala Nalaand construction of 18-MLD capacity STP.	Uttarakhand Peyjal Jal Nigam	Two years from sanction of funds.	**1620.00**	Proposed activities will be completed in two years from sanction and release of funds. Project proposal has been submitted to NMCG for funding.

b)	Sewer line from 6-drains to Sewage Pumping Station. Construction of Sewage Pumping Stations				
c)	Rising Main from SPS to proposed STPs; Construction of Sewage Treatment Plant (2MLD Capacity) and Other miscellaneous works, Land acquisition, O&M Works, E&M Works, Centage etc.				
d)	Monitoring of STPs outlet effluent quality w.r.t. STPs effluent discharge norms prescribed under E(P) Rules, 1986 as amended.	UEPPCB.	After commissioning of STP.	--	--
(e)	Utilization of treated sewage for flushing, construction activity, irrigation by irrigation drainage channel of treated sewage, industrial activity.	Peyjal Jal Nigam/ Irrigation Deptt.	One year	--	--
3. Solid Waste Management:					
a)	Door to door collection of solid waste in all 40 wards of town.	Nagar Palika Parisad, Kichha.	October, 2019	--	Facility for Solid waste processing and disposal is proposed through Haldwani cluster.
b)	Source segregation of wastes in all 40 wards of town.	Nagar Palika Parisad, Kichha.	April, 2020		
c)	Setting up solid waste processing facilities.	Nagar Palika Parisad, Kichha.	March. 2020		
4.Groundwater Quality					
a)	Groundwater quality monitoring at during summer (May-June) and	UEPPCB	Continuous activity	-	Ground water monitoring will be done

	winter (December-January).				in Summer and winter month.
5. Flood Plain Zone:					
(a)	Flood plain zoning of Kichha river.	State Irrigation Department	18 months from sanction of funds.	**72.89**	Proposal has been submitted to the State Govt.
(b)	Prohibition on illegal disposal of waste and removal of encroachment from river banks.	District Administration/Nagar Palika Parisad, Kichha	Continuous activity	-	Direction in this regard has already been issued by Urban Development Directorate. It will be monitored regularly.
6. Environmental Flow (E-Flow) and Groundwater recharge measures:					
(a)	Provisions of roof top rain water harvesting in Govt. building and construction of artificial lakes /ponds, wherever feasible.	District Administration/ Irrigation Deptt.	Continuous activity	-	Directions have already been issued by the Government.
7. Green Development:					
(a)	Development of green coverage along the Kichha river and its catchement	Forest Department	Two years	--	--

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