

**Revised Action Plan  
for Rejuvenation of Ganga River  
Stretches**

**Priority –IV**

## 1. INTRODUCTION

Haridwar is an ancient city of district Haridwar of Uttarakhand. The River Ganga, after flowing for 253 kilometres from its source at Gaumukh at the edge of the Gangotri Glacier, enters the Indo-Gangetic Plains of North India. According to the census 2011, Haridwar has a population of 310562, situated on the right bank of holy river Ganga and developed linearly along this river, the expansion of the city was restricted in west direction by the Rajaji National Park.

Haridwar is an important Hindu pilgrimage centre where the River Ganges exits the Himalayan foothills. Several sacred ghats have been made for holy dip in river water. Bhimgoda barrage on the river Ganges at Haridwar diverts the waters of the Ganges to the Ganges Canal, which irrigated the indo-gangetic plain of north India. Diversion of water of river Ganga through upper and lower Ganga canals leaves virtually very little water to flow in the main river Ganga.

## 2. WATER QUALITY GOALS:

Water is one of the most important components for survival of any kind of living organism. There are many rivers in India, but River Ganga is one of the holiest river. Due to its religious importance million of people take holy dips in river Ganga especially on auspicious occasions because it is believed that a holy dip in the same purges away all the sins. Therefore, maintaining water quality of river Ganga is a matter of paramount importance at least for bathing purposes i.e. Class-“B”, throughout the State. Municipal drains are main cause of concern and as such industrial wastewater does not flow directly into river Ganga at Haridwar. 22 drains have been identified in order to check pollution level in river Ganga and diverted to STPs. Strengthening sewerage network and treatment capacity is has been carried out under *NamamiGange* programme.

The Google image of Haridwar city along with river Ganga is annexed at Annexure - 01

### Water quality Characteristics of River Ganga at upstream of Haridwar at bhindhughat, Dudhiyaban, Haridwar (2018).

Month	pH	BOD (mg/L)	DO (mg/L)
Jan-18	9.92	<1	9.8
Feb-18	8.2	1	9.6
Mar-18	7.91	1	9.4
Apr-18	7.82	1	9.2
May-18	7.82	1	9.4
Jun-18	7.92	1	9.2
Jul-18	7.62	1	9
Aug-18	8.13	1	8.8
Sep-18	8.22	1	9.4
Oct-18	8.18	<1	9.6
Nov-18	8.41	<1	9
Dec-18	8.2	<1	10.2

**Water quality Characteristics of River Ganga at down stream of Haridwar at BalkumariMandir, Ajeetpur , Hardiwar (2018)**

<b>Month</b>	<b>pH</b>	<b>BOD (mg/L)</b>	<b>DO (mg/L)</b>
Jan-18	7.76	1	9.2
Feb-18	7.74	1	9
Mar-18	7.69	1.2	9.2
Apr-18	7.72	1	9
May-18	7.68	1.2	8.8
Jun-18	7.87	1	8.6
Jul-18	7.67	1	9.2
Aug-18	8.04	1.2	8.6
Sep-18	8.29	<1	10.6
Oct-18	8.21	1	9.6
Nov-18	7.8	1	9
Dec-18	8.1	1	9.6

**Water quality Characteristics of River Ganga at upstream of Haridwar at bhindhughat, Dudhiyaban, Hardiwar (2019).**

<b>Month</b>	<b>pH</b>	<b>BOD (mg/L)</b>	<b>DO (mg/L)</b>
Jan-19	8.12	<1	9.8
Feb-19	8.12	<1	9.6
Mar-19	7.62	1	9.2
Apr-19	7.64	1	9
May-19	7.82	1	9.2
Jun-19	7.92	1	9
Jul-19	7.7	1.2	8.2
Aug-19	7.92	1	8.8
Sep-19	8.44	1	9.8
Oct-19	8.3	1	10.8
Nov-19	8.4	1	10.6
Dec-19	8.02	1	10.4

**Water quality Characteristics of River Ganga at down stream of Haridwar at BalkumariMandir, Ajeetpur , Hardiwar (2019)**

<b>Month</b>	<b>pH</b>	<b>BOD (mg/L)</b>	<b>DO (mg/L)</b>
Jan-19	7.98	1	9.4
Feb-19	7.82	1	9.2
Mar-19	7.72	1	9
Apr-19	7.76	1	9
May-19	7.68	1	8.8
Jun-19	7.4	1.2	8.6
Jul-19	7.18	1.4	8.6
Aug-19	7.37	2	9
Sep-19	7.59	1.4	8.6
Oct-19	8.02	1.2	8.8
Nov-19	7.5	1	9

Dec-19	7.72	1	9.4
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**Water quality Characteristics of River Ganga at upstream of Haridwar at bhindhughat, Dudhiyaban, Haridwar (2020).**

Month	pH	BOD (mg/L)	DO (mg/L)	Total Coliforms MPN/100ml
Jan-20	7.7	1	10.8	90
Feb-20	7.5	<1	10	110
Mar-20	7.65	1	9.6	90
Apr-20	7.8	1	9.8	90
May-20	7.90	1	9.6	80
Jun-20	7.7	1	8.8	60
July-20	7.47	1.2	8.2	70
Aug-20	8.03	1	10.4	110

**Water quality Characteristics of River Ganga at down stream of Haridwar at BalkumariMandir, Ajeetpur , Haridwar (2020).**

Month	pH	BOD (mg/L)	DO (mg/L)	Total Coliforms MPN/100ml
Jan-20	7.1	1	9.6	110
Feb-20	7.26	1	9.4	140
Mar-20	7.64	1.2	9.6	110
Apr-20	7.7	1	10	90
May-20	8.02	1.2	9.2	80
Jun-20	7.68	1.4	9	70
July-20	7.2	1.2	8.4	60
Aug-20	7.78	1.4	8.4	140
Bathing Water Quality Standard	6.5-8.5	3 or less	5 or more	Less than 500

*Note :The basic objective of the Rejuvenation of polluted river stretches is to maintain the class of the river water quality as suitable for bathing. The water quality characteristics of River Ganga at downstream of Haridwar city (BalkumariMandir, Ajeetpur ) indicates all values of designated parameters within the prescribed norms as specified for bathing standards in designated best use criteria. The Action Plan for rejuvenation of river Ganga Haridwar to Sultanpur stretches is not required to be prepared as it is already meeting the bathing class B.*

Municipal drains are major cause of concern at Haridwar. Tapping of drains and establishment of STPs have completed with inception of Ganga Action Plan. Presently, up-gradation and augmentation of sewerage network has been completed under “*NamamiGange*” program, which would certainly improve water quality of river Ganga.

The drainage map of river ganga is annexed at Annexure - 02

### **3. IDENTIFICATION OF SOURCE OF WATER POLLUTION:**

The proposed action plan for rejuvenation of river Ganga (between Haridwar to Sultanpur) 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. As per report of River Pilakhar no industrial pollution control is found in the river.

**(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 Ganga.
- 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 on 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.**

- a. Flood plain zoning.
- b. Regulating activities in flood plan zone.

**3.4 Ecological/Environmental Flow (E-Flow)**

- i. Maintaining E-Flow.

**4. RIVER REJUVENATION PLAN:**

**4.1 Industrial Pollution Control:**

State Pollution Control Board is vigil on operation of Common Effluent Treatment Plant (CETP) and individual effluent treatment plants of industries which are located in the area where connectivity to CETP is not available. Grossly polluting industries (GPIs) and other categories of water polluting industries are motoring closely. There are 07 GPIs operating in the Haridwar area. Details of GPIs are given as below:

<b>SN</b>	<b>Industry Name</b>	<b>Water Consumption (KLD)</b>	<b>Wastewater Generation (KLD)</b>	<b>Compliance Status</b>
1	Hero Motocorp Ltd., Plot-3, Sector-10, IIE, Haridwar.	4600	780	Comply

2	KwalityPolythreads Ltd., Plot O. 34, Sectro-3A, IIE Haridwar.	262	245	Comply
3	Kranti Automobile Ltd., Plot No. 10&11, Sector-8A, IIE, Haridwar.	07	04	Comply
4	Alps Industries Ltd., Plot No. 1A, IIE Haridwar.	690	486	Comply
5	Texplas India Pvt. Ltd., BahadurpurSiani, Haridwar.	500	500	Comply

Out of above 5-GPIS, 02-GPIS are having individual effluent treatment system while rest are connected with CETP for treatment and disposal of process wastewater after primary treatment system in order to meet CETP inlet standards. M/S Hero Motocorp Ltd. is complying with ZLD as treated water is being used in process and other utilities.

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 UKPCB.

#### **4.2 Industrial hazardous waste management:**

Recyclable hazardous wastes, mainly used oil /contaminated barrels are being recycled through registered recyclers, while landfillable waste is being disposed through M/S Bharat Oil and Waste Management Pvt. Ltd. located at Laksar, Distt. Haridwar 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.

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.

#### **4.3 Domestic Sewage treatment:**

It is estimated that 108 MLD sewage is generated from the Haridwar city and 15 MLD sewage is generated from satellite areas viz. HaripurKalan, Jagjeetpur, Sitapur, Sarai and Shivakil Nagar. Various activities of sewage collection and treatment carried out under GAP-I, GAP-II, KumbhMela budget, Special Central Assistance, NGRBA and JnNURM. Present status of sewage treatment is as follows:

- (i) 27 MLD; 18 MLD and 68 MLD capacities STP are operating with efficiently and meeting with discharge norms.
- (ii) 14 & 18 MLD STP at Sarai, Jwalapur is in operation .

#### **Interception and Diversion of Drains:**

The status of various drains along with their tapping status in Haridwar area is as follows:

SN	Name of the Drain	Flow in MLD	Flow Status	Tapping Status
1.	LoknathNala	6.4	Perennial	Tapped
2.	SaptasarovarNala	0.1	Perennial	Tapped

<b>SN</b>	<b>Name of the Drain</b>	<b>Flow in MLD</b>	<b>Flow Status</b>	<b>Tapping Status</b>
3.	BheemgodaNala	0.97	Perennial	Tapped
4.	KaroliNala	0.05	Perennial	Tapped
5.	Railway Nala	0.05	Perennial	Tapped
6.	KaranwalNala	0.05	Perennial	Tapped
7.	KangraMandirNala	0.13	Perennial	Tapped
8.	NaiSotaNala	0.05	Perennial	Tapped
9.	NagokiHaweliNala	0.05	Perennial	Tapped
10.	KushaghatNala	0.04	Perennial	Tapped
11.	LaltaraoNala	0.39	Perennial	Tapped
12.	MayapurNala	0.26	Perennial	Tapped
13.	PWD Nala& Tank No. 6 Nala	3.30	Perennial	Tapped
14.	DevpuraNala	1.00	Perennial	Tapped
15.	AwasVikasNala	0.75	Perennial	Tapped
16.	LalMandirNala	0.70	Perennial	Tapped
17.	LatowaliNala	0.40	Perennial	Tapped
18.	JagjeetpurNala	0.30	Perennial	Tapped
19.	MatrisadanNala	0.70	Perennial	Tapped
20.	Kasai Nala	8.10	Perennial	Tapped
21.	RamrakkhaNala	0.70	Perennial	Tapped
22.	PandeywalaNala	7.00	Perennial	Tapped

As per report of the UttarakhandPeyjal Nigam, from Haridwar town up to Sultanpur no liquid domestic drain is flowing in to the River Ganga is identified. Hence, no further action plan is prepared for interception and diversion of drains, however all 22 drains located in Haridwar area has been tapped.

#### **4.4 Solid Waste Management:**

About 255 MTD solid wastes is generated from the Haridwar city. Nagar Nigam, Haridwar is statutory body responsible for management of solid wastes as per provisions of Solid Waste Management Rules, 2016 as amended. The population of Haridwar town is 175723 as per census of 2011. Nagar Nigam is divided into 60 wards. 100% door to door collection is being undertaken.

<b>S.N.</b>	<b>Name of ULB</b>	<b>No. of Wards</b>	<b>Quantity of Waste MTD</b>	<b>D-to-D collection</b>	<b>Source segregation</b>	<b>Compliance status</b>
1	Nagar Nigam Haridwar	60	225	100%	7%	The common treatment and disposal facility is operational.

#### **4.5 C & D Waste Management:**

The Uttarakhand Urban Development Department has issued necessary directions to all local body for identification of site for disposal of C& D Waste. The office order issued is annexed at Annexure – 01.

#### 4.6 Ground Water Quality:

So far contamination of groundwater is not reported in the area, however groundwater quality monitoring being carried out on half yearly basis. The analysis report is as follows:

##### General Parameter

Locations	Parameter mg/l.					
	pH	EC	TDS	COD	Fluoride	Total Hardness
Up stream of River Ganga	7.86	371	225	-	BDL	211
Down stream of River Ganga	7.34	531	326	-	BDL	266

##### Heavy Metals

Locations	Parameter mg/l.					
	Cd	Cr	Ni	Zn	Fe	As
Up stream	BDL	BDL	BDL	0.61	BDL	BDL
Down stream	BDL	BDL	BDL	0.13	BDL	BDL

#### 4.7 Flood Plan Zone (FPZ):

The flood plan zoning of River Ganga from Haridwar to Sultanpur has been prepared and notified by the government. In order to regulate restricted activities in flood plan zone, action will be taken by concern department.

#### 4.8 Environmental Flow (E-Flow):

A minimum of 15 % discharge of lean period shall be maintained in compliance of State Government order dated 05.06.2018 in River Ganga and its tributaries in Upper catchment. The State Govt. has entrusted this responsibility to Uttarakhand Jal Vidyut Nigam Ltd. Forestry intervention catchment could be certainly augment water retention and flow of rivers.

#### 4.9 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.

#### 4.10 Activities wise Gap Analysis details

##### Municipal Solid waste

S.no.	Name of ULB	Total Solid Waste Generation (MTD)	Available facility	Gaps
1	Nagar Nigam, Haridwar	255	The Treatment and disposal facility	Nil

			available and operational.	
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### **Municipal Sewage Management**

<b>S.no.</b>	<b>Name of ULB</b>	<b>Total Waste Water Generation (MLD)</b>	<b>Available Treatment facility</b>	<b>Gaps</b>
1	Nagar Nigam, Haridwar	145	05 STP are operational with total capacity of 145 MLD in Haridwar town. Tapping of all drains of Haridwar is completed.	Nil

### **Industrial Waste Water Management**

<b>S.no.</b>	<b>Name of ULB</b>	<b>No. of Unit</b>				<b>Available Treatment facility</b>	<b>Gaps</b>
		<b>Red</b>	<b>Orange</b>	<b>Green</b>	<b>Total</b>		
1	Nagar Nigam, Haridwar	00	00	00	00	There is no Industrial units in catchment area.	Nil

### **Bio-Medical Waste Management**

<b>S.no.</b>	<b>Name of ULB</b>	<b>Total No. of HCF</b>	<b>Total BMW Generation (KG/Day)</b>	<b>Available Treatment facility</b>	<b>Gaps</b>
1	Nagar Nigam, Haridwar	86	135	Common BWM Treatment Facility Bhagwanpur, Roorkee	Nil

## **5. ACTION PLAN:**

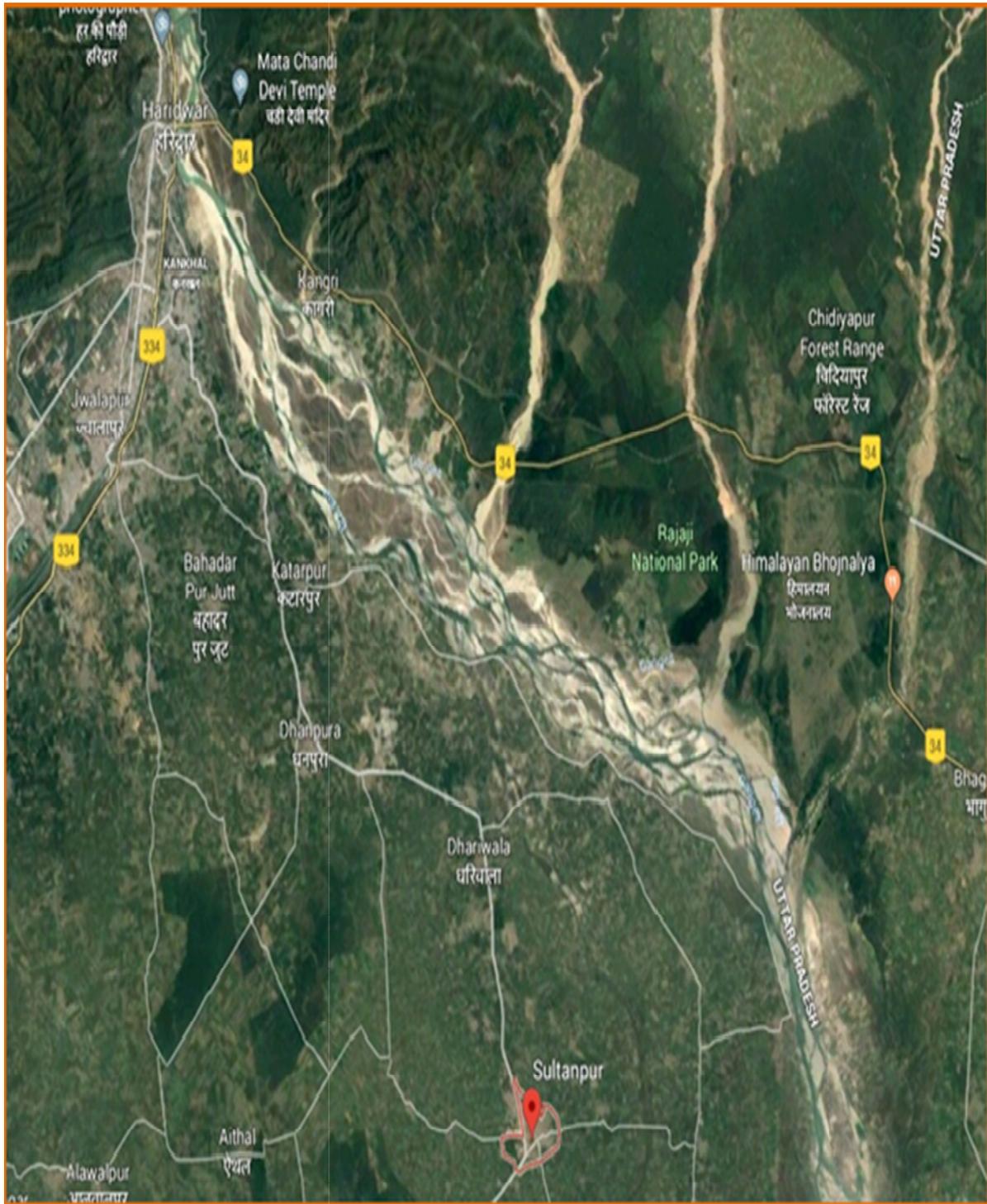
**Identified activities and concerned authorities for initiating actions and the time limits and budgetary requirements:**

<b>SN</b>	<b>Action plan for rejuvenation of river Ganga (Haridwar to Sultanpur)</b>	<b>Organisation/ Agency Responsible for Execution of the Action Plan</b>	<b>Budgetary Requirement (Rs. In Lacs)</b>	<b>Remarks</b>
<b>1. Industrial Effluent Management:</b>				
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 / UKPCB	Nil	Continuous activity.
b)	Strengthening of Environment Surveillance Squad (ESS) of UEPPCB	UKPCB	Nil	Continuous activity.
c)	Monitoring of drains carrying industrial wastewater and CETP outlet.	UKPCB	Nil	Continuous activity.
<b>2. Networking of Conveyor System of CETP:</b>				

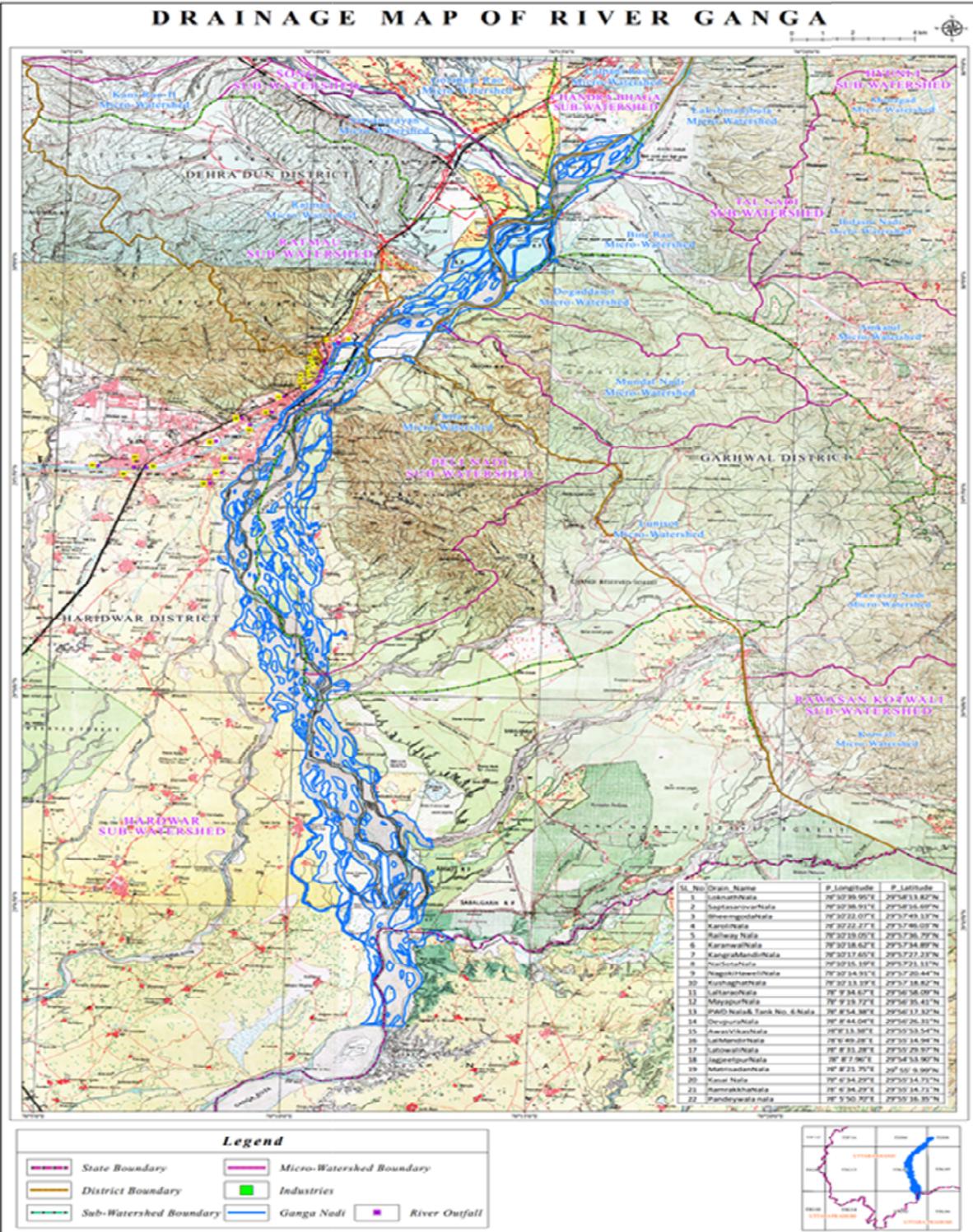
a)	Establishment of leftover conveyor networking leading to CETP	SIIDCUL	241.00	The work order is issued and will be completed by October, 2020.
<b>3. Sewage Management:</b>				
a)	Interception and diversion of all 22- drains.	UttarakhandPeyjalJal Nigam	Nil	05 STP are operational with total capacity of 145 MLD in Haridwar town. Tapping of all drains of Haridwar is completed.
b)	Installation of 2-Nos. of STPs (68 MLD at Jagjeetpur and 14 MLD at Sarai.			
<b>4. Solid Waste Management:</b>				
a)	Door to door collection of solid waste in all 40 wards of town.	Nagar Nigam, Haridwar.	Nil	The Treatment and disposal facility available and operational.
b)	Source segregation of wastes in all 40 wards of town.			
c)	Efficient Operation of waste processing facilities.			
<b>5. Groundwater Quality:</b>				
a)	Groundwater quality monitoring at during summer (May-June) and winter (December-January).	UKPCB	-	Ground water monitoring is being carried out by UKPCB on half yearly basis.
<b>6. Flood Plain Zone:</b>				
a)	Flood plain zoning	Irrigation Department	--	Prepared and Notified by GoU.
b)	Regulating restricted activities in flood plan zones.	Irrigation Department / District Administration	--	Continuous activity
<b>7. Environmental Flow:</b>				
a)	Maintain e-flow in river Ganga and its major tributaries	UJVN Ltd.	--	Continuous activity
<b>8. Catchment are treatment:</b>				
a)	The catchment are treatment of the river is proposed to be carried out through CAMPA, the work will be initiated from January 2021.			

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**Annexure-1**



### DRAINAGE MAP OF RIVER GANGA



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