

**Action Plan for Rejuvenation of**

**RIVER SUSWA**

**Dehradun, Uttarakhand**

**(River Stretch: Mothrawala to Raiwala)**

**Priority - I**

**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**

**July, 2019**

**Action Plan: 3**

**Action Plan for Rejuvenation of**  
**RIVER SUSWA**  
**Dehradun, Uttarakhand**  
**(River Stretch: Mothrawala to Raiwala )**

**Priority - I**

**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**

**July, 2019**

## **INDEX**

<b>SN</b>	<b>Topic</b>	<b>Page No.</b>
	Executive Summary	3
1.	Introduction	4
2.	Water Quality Goals	5
3.	Water quality characteristics of river Suswa	6
4.	Identification of Source of Pollution	10
5.	Gap Analysis	11
	5.1 Sewage Management	11
	5.2 Industrial Effluent Management	14
	5.3 Industrial Hazardous Waste Management	15
	5.4 Solid Waste Management	15
	5.5 Bio-medical Waste	16
	5.6 Groundwater Quality Monitoring	16
6.	River Rejuvenation Plan	17
	6.1 Interception and Diversion of drains and construction of STPs	17
	6.2 Establishment of Solid Waste Processing and Disposal Facility	119
	6.3 Flood Plain Zone	20
	6.4 Environmental Flow and Groundwater recharge measures	20
	6.5 Greenery Development	20
	6.6 Utilization of Treated Sewage	21
	6.7 Monitoring of Action Plan	21
7.	Action Plan	22

### ***Executive Summary***

*River Suswa originates in the midst of the clayey depression near the source of the Asan, towards the East of the Asarori - Dehradun Road. Suswa river drains the Eastern part of Dehradun city and flows into river Ganga after merging with river Song. Song and Suswa rivers are two main tributaries of river Ganga. Dehradun and Doiwala are two major urban settlement situated in catchment of Suswa river. As per census 2011, population of Dehradun is 578,420 and Doiwala is 8709. Apart from urban settlement, there are 11 villages also located along the Suswa river.*

*Rispana and Bindal rivers are two major drainage networks which carry urban drainage of Dehradun city and joins river Suswa at Mothrawala. It is reported that Rispana and Bindal rivers carries 9.386 MLD and 18.14 MLD municipal wastewater, respectively from Dehradun city. Interception, Diversion and treatment of above two rivers are propose under Namami Gange programs.*

*After confluence with Rivers Rispana and Bindal at Mothrawala, river Suswa joins by several drains including River Song. A total of 51 drains including river Song are flowing towards this catchment.*

*Based on water quality data for the years 2016 and 2017, River Suswa from Mothrawala to Raiwala (approximately 31 Km.) has been identified as polluted river stretch by the Central Pollution Control Board (CPCB) because of high concentration of BOD (>30mg/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 water quality of polluted river stretch of Suswa river. In order to improve river water quality, proposed activities are interception, diversion and treatment of Rispana and Bindal rivers and other polluting drains, establishment of Solid waste processing and disposal facility for Doiwala, monitoring of STPs, prohibition on illegal disposal of waste in river beds, groundwater quality monitoring and recharge measures, plantation in catchment etc. About Rs. 8471.76 Lakhs would be required for proposed activities.*

## **1. INTRODUCTION**

River Suswa originates in the midst of the clayey depression near the source of the Asan, towards the East of the Asarori - Dehradun Road. Suswa river drains the Eastern part of Dehradun city and flows into river Ganga after merging with river Song. Song and Suswa rivers are two main tributaries of river Ganga. Suswa flow south-east draining the eastern doon along with its ephemerals tributaries namely – Rispana and Bindal, and joins river Song at south-east of Doiwala. River Song has its origin from adjoining Tehri district, which initially runs parallel to the Mussoorie mountain chain and then takes turn south-east direction and joins river Suswa at south-east of Diowala.

### **Major town/villages in the catchment of river Suswa:**

Dehradun and Doiwala are two major urban settlement situated in catchment of Suswa river. As per census 2011, population of Dehradun is 578,420 and Doiwala is 8709. Rispana and Bindal rivers are two major drainage networks which carry urban drainage of Dehradun city and joins river Suswa at Mothrawala, downstream of Dehradun city. Village located along the Suswa river are Mohamadpur Badkali, Panduwala, Dhudhali, Kishanpur, Nagal Bulandwala, Markhamgrant, Nagal Jwalapur, Simlasgrant, Gauhari Mafi, Pratoitnagar and Raiwala.

### **Major drains contributing sewage / municipal drainage in the river Suswa:**

Rispana and Bindal are two main rivers which carry municipal drains of Dehradun city and joins river Suswa at Mothrawala. The Uttarakhand Peyjal Nigam has carried out inventory of drains joining to the rivers Rispana and Bindal located in the upper catchment. It is reported that about 9.386 MLD municipal wastewater is flows into river Rispana through 177 *nalas* and 2901 households outlets on both banks of river. Similarly, 18.14 MLD municipal wastewater is flowing into river Bindal. Interception, Diversion and treatment of above two rivers are proposed through financial assistance under Namami Gange programs.

After confluence with Rivers Rispana and Bindal at Mothrawala, river Suswa joins by several drains including River Song. A total of 51 drains including river Song are flowing towards this catchment. On the basis of discharge and BOD contents, three drains, namely - Nala Sapera Basti Nala, Nala near Rajiv Gandhi International Stadium bridge, and Nala Shyampur near Polytechnic have been identified for interception, diversion and treatment.

### **Major drains contributing industrial effluent in the river Suswa:**

Two grossly polluting industries are located in the catchment of river Suswa and Song. The distillery unit is maintaining ZLD with Multi Effect Evaporator, while sugar unit has provided appropriate capacity effluent treatment plant and maintaining effluent discharge norms. Wastewater water from sugar mill flows into the river Suswa through small *nalla*.

Based on water quality data for the years 2016 and 2017, River Suswa from Mothrawala to Raiwala (approximately 31 Km.) has been identified as polluted river stretch by the Central Pollution Control Board (CPCB) because of high concentration of BOD (>30mg/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 water quality of polluted river stretch of Suswa river from Mothrawala to Raiwala.

## **2. WATER QUALITY GOALS:**

It is an important aspect for revival of river Suswa in context of meeting water quality criteria for bathing Class- "B". It is to mention that River Bindal and Rispana rivers flows with municipal wastewater from the eastern part of Dehradun city and joins the river Suswa at Mothrawala. In order to restore water quality, it is imperative to intercept and divert of these two rivers for treatment before meeting to Suswa river. However, 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.

### **3. WATER QUALITY CHARACTERISTICS OF RIVER SUSWA:**

River quality monitoring of Suswa and Song Rivers are being carried out by the Uttarakhand Environment Protection and Pollution Control Board (UEPPCB) at Mothrowala (Suswa River) and near Birla Guest House (upstream of Raiwala) of River Song. Mothrowala sampling point is located after mixing of rivers Rispana and Bidal - which are carrying most of the municipal drainage of Dehradun city. About 20 Km downstream of Mothrowala, river Suswa joins river Song and thereafter named as river Song. After travelling about 11 Km River Song joins River Ganga near Birla Guest House, upstream of Raiwala. Sampling point of river Song is location about 50 meter before confluence to River Ganga. Water quality characteristics of river Suswa and river Song in the year 2018 is as given below:

#### **A. Water quality characteristics of river Suswa at Mothrowala (Downstream of Dehradun) during the year 2018 & 2019 (up to June 2019).**

<b>Month</b>	<b>pH</b>	<b>B.O.D. (mg/L)</b>	<b>C.O.D. (mg/L)</b>	<b>D.O. (mg/L)</b>	<b>Total Coliform (MPN/100 ml)</b>
<b>Jan-18</b>	7.84	32	156	2.8	>1600
<b>Feb-18</b>	7.91	36	172	2.2	>1600
<b>Mar-18</b>	7.88	34	134	2.4	>1600
<b>Apr-18</b>	7.82	36	142	2.2	>1600
<b>Mar-18</b>	7.88	34	134	2.4	>1600
<b>Apr-18</b>	7.82	36	142	2.2	>1600
<b>May-18</b>	7.79	32	128	2	>1600
<b>Jun-18</b>	7.82	34	132	2.4	>1600
<b>Jul-18</b>	7.66	32	128	3	>1600
<b>Aug-18</b>	7.86	34	118	2.6	>1600
<b>Sep-18</b>	7.82	32	110	2.4	>1600
<b>Oct-18</b>	7.81	34	128	2.6	>1600
<b>Nov-18</b>	8.15	32	136	2	>1600
<b>Dec-18</b>	8.21	30	124	2.4	>1600
<b>Average (Min-Max)</b>	<b>7.88 (7.66-8.21)</b>	<b>33.17 (30-36)</b>	<b>134.00 (110-172)</b>	<b>2.42 (2-3)</b>	

Month	pH	B.O.D. (mg/L)	C.O.D. (mg/L)	D.O. (mg/L)	Total Coliform (MPN/100 ml)
Jan-19	8.15	26	86	2.8	>1600
Feb-19	7.85	28	110	3.0	>1600
Mar-19	7.52	30	136	9.4	>1600
Apr-19	7.84	28	112	3.0	>1600
Mar-19	7.79	30	120	2.6	>1600
Jun-19	7.85	26	126	2.8	>1600
<b>Average</b>	<b>7.88</b>	<b>25.0</b>	<b>115.0</b>	<b>2.83</b>	

**B. Water quality of river Song near Birla Guest House at upstream of Raiwala (before confluence to River Ganga) during the year 2018 (June onwards & 2019 (up to June 2019)).**

Month	pH	D.O. (mg/L)	B.O.D. (mg/L)	Fecal Coliform (MPN/100 ml)
Jul-18	7.93	6.8	1.8	500
Aug-18	7.85	7.0	1.6	580
Sep-18	7.46	8.4	1.2	500
Oct-18	7.67	8.8	1	280
Nov-18	7.87	9.0	1	130
Dec-18	7.78	9.4	1	110
<b>Average (Range)</b>	<b>7.8 (7.46-7.93)</b>	<b>8.2 (6.8-9.4)</b>	<b>1.3 (1-1.8)</b>	<b>350 (110-580)</b>

Month	pH	D.O. (mg/L)	B.O.D. (mg/L)	Fecal Coliform (MPN/100 ml)
Jan-19	7.96	9.4	1.0	170
Feb-19	7.48	9.6	1.0	220
Mar-19	7.52	9.4	1.0	170
Apr-19	7.54	9.2	1.0	220
May-19	7.48	8.8	1.0	280
Jun-19	7.84	9.0	1.0	220
<b>Average</b>	<b>7.64</b>	<b>9.23</b>	<b>1.0</b>	<b>213</b>



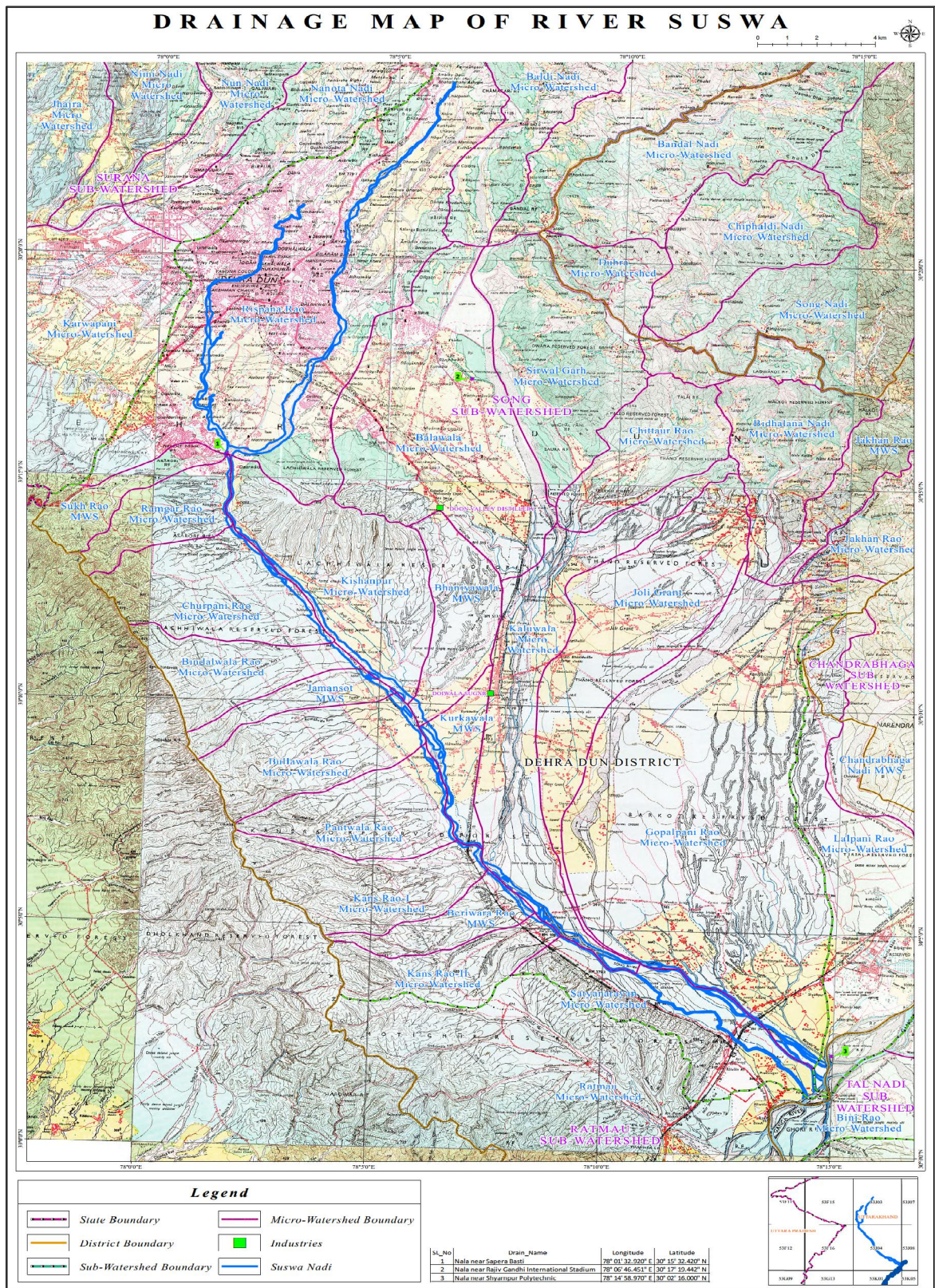
## Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun

From the above water quality data it is apparent that BOD content remains high all the time in River Suswa at Mothrawala, which may be because of municipal wastewater carrying by rivers Rispana and Bindal. Further, BOD content decrease significantly up to 1.0 mg/L in river Song at Birla Guest House. Natural purification as well as dilution of river Song water might have significant role in decreasing pollution load.



**Fig. 1:** Google map showing Dehradun City and main river draining in to river Suswa.

**Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun**



**Fig. 2:** Drainage map of river Suswa/ Song, Dehradun..

#### **4. IDENTIFICATION OF SOURCE OF POLLUTION:**

Major source of pollution in river Suswa are:

- (i) Sewage and Municipal drainage of Dehradun city.
- (ii) Industrial pollution.
- (iii) Improper disposal of solid waste.
- (iv) Agriculture runoff.

Following components have identified for preparation of action plan for rejuvenation of Suswa river in compliance of the Hon'ble NGT orders as detailed below:

##### **(a) 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 Suswa.
- iv. Interception and diversion of municipal drains to STPs.
- v. Treatment and disposal of septage and controlling open defecation.

##### **(b) Industrial Pollution control:**

- i. Identification of pollution potential industries.
- ii. Assessment of Water consumption and wastewater discharge and gap in treatment of industrial effluent.
- iii. Provision of wastewater treatment system.

##### **(c) Solid Waste Management:**

- i. Implementation of Door-to-Door collection.
- ii. Identification of suitable site for setting up common waste processing and secure landfill facility and / or operation of waste processing and disposal facility in accordance of provisions of the Solid Waste Management Rules, 2016.

- iii. Transportation, disposal and treatment facilities of municipal solid wastes generated from town in accordance of provisions of the Solid Waste Management Rules, 2016.
- iv. Restriction illegal disposal of solid waste along the river banks and flood plain zones.
- v. Prohibition on burning of solid wastes.
- vi. Implementation of Construction and Demolition Wastes Management Rules.

## 5. GAP ANALYSIS:

### 5.1 Sewage Management:

**Dehradun:** Dehradun is the major urban settlement located in the catchment of river Suswa. Details of sewage generation of Dehradun city is detailed below:

1.	Name of City	Dehradun	
2.	Population (as per census, 2011)	574840	
3.	Expected Population (2035) (with 2% floating population)	1316000	
4.	Water Consumption in litres per capita per day with 20% margin for GW consumption i.e., 162 Lit/head /day	213192 KLD	
5.	Total Sewage generation in KLD (in 2035)	170.55 MLD	
6.	Existing STP nos/Septic tanks	<b>Operational STPs</b>	<b>Capacity (MLD)</b>
		Doon Vihar Jakha	1.0
		Salawala	0.71
		Vijay Colony	0.42
		Mothrawala-I	20.0
		Kargi	68.0
		Indira Nagar	5.0
		Mothrawala-II	20.0
<b>Total</b>		<b>115.13</b>	

**Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun**

		<table border="1"> <tr> <th colspan="2">Under Construction STPs</th> </tr> <tr> <td>Kaulagarh</td> <td align="right">3.0</td> </tr> <tr> <td>Daudwala</td> <td align="right">1.0</td> </tr> <tr> <td align="center"><b>Total</b></td> <td align="right"><b>4.0</b></td> </tr> </table>	Under Construction STPs		Kaulagarh	3.0	Daudwala	1.0	<b>Total</b>	<b>4.0</b>
Under Construction STPs										
Kaulagarh	3.0									
Daudwala	1.0									
<b>Total</b>	<b>4.0</b>									
		Captive Septic Tanks : All houses								
7.	Total sewage treatment capacity through STPs/Septic Tanks	STPs: Operational: 115.13 MLD Under Construction: 4.0 MLD  Septic Tanks: Individual households								
8.	Gap in Sewage Treatment	51.42 MLD								

Sewage generation of Dehradun city is about 170.55 MLD. Existing treatment capacity of STPs is 115.13 MLD, while 4.0 MLD STPs is under construction; however, absence of sewerage network full treatment capacity is not utilized.

**Doiwala Town:**

1.	Name of the Town	Doiwala
2.	Population (as per census, 2011)	55791
3.	Expected Population (2035) (with 2% floating population)	95837
4.	Water Consumption in litres per capita per day with 20% margin for GW consumption i.e., 162 Lit/head /day	15525 KLD
5.	Total Sewage generation in KLD (in 2035)	12.42 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 Septic Tanks: Individual households
8.	Gap in Sewage Treatment	100%

### **Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun**

---

The Uttarakhand Peyjal Nigam has carried out inventory of drains joining to the rivers Rispana and Bindal located in the upper catchment. It is reported that about 9.386 MLD municipal wastewater in flows into river Rispana through 177 *nalas* and 2901 households outlets on both banks of river. Similarly, 18.14 MLD municipal wastewater is flowing into river Bindal. Further, after confluence with Rivers Rispana and Bindal at Mothrawala, river Suswa joins by several drains including River Song. A total of 51 drains including river Song are flowing towards this catchment. On the basis of discharge and BOD contents, following polluted drains have been identified:

#### **Dry weather discharge and BOD concentration of drains:**

<b>SN</b>	<b>Name of Drains</b>	<b>Approx. dry weather discharge (MLD)</b>	<b>BOD (mg/L)</b>
1.	Nala Sapera Basti	1.50	85.0
2.	Nala near BSF Camp	2.0	17.0
3.	Nala near Rajiv Gandhi International Stadium bridge	1.0	72.2
4.	Nala Shyampur near Polytechnic	5.0	35.0
5.	Shyampur river (converted into nala due to solid & liquid waste of Shyampur town)	20.0	21.0

## **5.2 Industrial Effluent Management:**

Two grossly polluting industries are located in the catchment of river Suswa and Song. Details of those two industries are given below:

<b>SN</b>	<b>Industry Name</b>	<b>Water Consumption (KLD)</b>	<b>Wastewater Generation (KLD)</b>	<b>Status of Treatment Plant</b>	<b>Capacity of ETP (KLD)</b>	<b>Gap (4)-(6)</b>	<b>Final Mode of disposal</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Doon Valley Distillers, Kuanawal, Dehradun	125	ZLD	Maintaining ZLD MEE	106	Nil	ZLD
2	Doiwala Sugar Complany Ltd., Doiwala, Dehradun	4152	740	Operational Captive ETP	1000	Nil.	Land disposal

The distillery unit is maintain ZLD with multi effect evaporator, while sugar unit has provided appropriate capacity effluent treatment plant and maintaining effluent discharge norms. Wastewater water from sugar mill flows into the river Suswa through small *nalla*.

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.

Apart from GPIs, M/S Flex Food Ltd., Laltappar is also operating in the catchment consuming about 75.25 KLD water and generating about 60 KLD wastewater. Unit has provided effluent treatment system and treated water is being reuse in irrigation uses.

As such there is no gap is in industrial wastewater generation and treatment system.

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

### **5.3 Industrial Hazardous Waste Management:**

About 3.9MTA hazardous waste is generated from the catchment. Out of which 1.6 MTA is recyclable hazardous wastes, mainly used oil and is being recycled through registered recyclers. 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 and 1000 MT/month incineration capacity.

### **5.4 Solid Waste Management:**

**Dehradun:** Nagar Nigam, Dehradun is statutory body responsible for management of solid wastes as per provisions of Solid Waste Management Rules, 2016. Population of Dehradun city is 574840 as per census of 2011. Nagar Nigam is divided into 100 wards. Partial door to door collection is being undertaken in 60 wards. Solid waste processing and disposal facility of has been developed at Sheemshamwada with capacity of 300 MTPD. Nagar Nigam has approved Bye Laws for user charges. Nagar Nigam Dehradun has developed appropriate facility for waste processing and disposal and collected waste is being processed and disposed through facility.

**Doiwala:** Nagar Palika Parisad, Doiwala is divided into 20 municipal wards with total population of 8709. About 20 MTPD solid wastes is generating from municipality. It is proposed to process and dispose solid waste of Doiwala with waste processing facility of Rishikesh cluster. Land for waste processing facility has been identified and land transfer process is under way. Once the land is transfer to municipality, DPR for the same will be prepared. In case of villages located along the Suswa river, following activities are being carried out under Swachh Bharat Mission- Rural:

<b>Solid-Liquid Waste Management related works carrying out in Gram Panchayats under Swachh Bahrat Mission (Gramin):</b>	
<b>A. Liquid Waste Management</b>	Construction of PVC/CC Drains & Individual / Community Soak pits.
<b>B. Solid Waste Management</b>	Establishment of Segregation Centre, individual dustbins, Community Garbage Pits, Individual



	Biogas plant and Vermi compost/NEDEP Compost Pit.
<b>C. Social/ HRD activities</b>	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 carrying out in 60 wards out of 100 wards by Nagar Nigam, Dehradun, while in Doiwala it is being carried out in 4 wards out of 20 wards. A segregated plastic waste 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:**

About 541 Health Care Facilities (HCFs) are operating in catchment of river Suswa / Song. It is estimated that about 1595 Kg/day biomedical waste is generated from these healthcare facilities. Common Bio-medical Waste Treatment Facility (CBMWTF) is located at Mandavar, Rorkee. Most of HCFs are contributing their waste to CBMWTF for treatment and disposal.

### **5.6 Groundwater Quality Monitoring:**

Regular groundwater quality monitoring station is not located in catchment of river Suswa. Groundwater quality monitoring stations will be fixed and monitoring will be carried out on half yearly basis for core parameters, heavy metals and pesticides.

**6. RIVER SUSWA 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 Plants:**

**(a) Upper catchment of River Suswa (Up to Mothrawala):**

Activity	Time limit	Cost (Rs. In Lakhs)
Tapping of 177 nos. of nalas/drain and 2901 nos. open household outlets on both banks of river Rispana.	March, 2021	<b>6000.00</b>
Carrier line of 30.88 Km and appurtenant works.		
Construction of STP (1.0 MLD capacity)		
Diversion structure of Bindal river to 68 MLD STP.		
Operation and maintenance for 15 years of I&D works and STP.		

Above interception & diversion work and construction of STP works including operation and maintenance works for 15 years are sanctioned under Namami Gange programs. Tendering is under progress and it is expected that proposed work will start within next two months.

**(b) Mothrawala to Shyampur Area (up to confluence to River Ganga):**

**Proposed Interception and Diversion of drains work:**

Name of Drain	I & D Activity	Cost (Rs. in Lakhs)
Nala Sapera Basti	Proposed	37.00

**Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun**

Nala near BSF Camp	Not proposed	Nil
Nala near Rajiv Gandhi International Stadium bridge	Proposed	109.35
Nala Shyampur near Polytechnic	Proposed	65.51
Shyampur river(converted into nala due to solid & liquid waste of Shyampur town)	Not proposed	Nil
<b>Total</b>		<b>211.86</b>
2-drains are not proposed for I&D activity because of low BOD concentration and low discharge.		

**Proposed Sewage Treatment Plants:**

Existing	Proposed	Proposed capacity of STP (MLD)	Cost (Rs. in Lakhs)
Nil	Nala Saperabasti	1.5 MLD	608.80
	Nala near Rajiv Gandhi International Stadium bridge	1.0 MLD	494.40
	Nala Shyampur near Polytechnic	5.0 MLD	1062.80
<b>Total</b>			<b>2166.00</b>

**Other Activities and expenses:**

Activity	Cost (Rs. in Lakhs)
<b>A. Operation and Maintenance of 3 Nos. STPs for 15 years.</b>	
i) Nala Saperabasti	949.95
ii) Nala near Rajiv Gandhi International Stadium bridge	641.63
iii) Nala Shyampur near Polytechnic	1445.27
<b>Sub Total</b>	<b>3036.85</b>
<b>B. Operation and Maintenance of 3 Nos. I&amp;D works for 15 years.</b>	
Total O&M Cost	3097.08
<b>C. Land Acquisition for STP and I&amp;D Works</b>	150.00

D. Provisions for DPR preparation, Supervision & centage charges @ (4% +=4%)=8% on capital Rs. 2377.83 Lakhs.	190.023
<b>Total</b>	<b>5815.16</b>

Total estimated cost of activities as listed above is: **Rs. 5815.16 Lakhs** say **Rs. 5816 Lakhs**.

### **6.2 Establishment of Solid Waste Processing and disposal facility:**

**Doiwala:** Nagar Palika Parisad, Doiwala is divided into 20 municipal wards with total population of 8709. About 20 MTPD solid wastes is generating from municipality. It is proposed to process and dispose solid waste of Doiwala with waste processing facility of Rishikesh cluster. Land for waste processing facility has been identified and land transfer process is under way. Once the land is transfer to municipality, DPR for the same will be prepared. It is expected that about Rs.2569 Lakhs would be required for setting up waste processing and disposal facility for Rishikesh cluster.

<b>Nagar Palika Parisad, Doiwala:</b>	
Total Population	55791 (as per 2011 census)
No. of municipal wards	20
Total waste generation	20 MTPD
Door to Door collection	04 wards
Bye Laws for user charges	Approved and being implemented.
Realization of user charges	~ Rs. 0.28 Lakhs per month.
Waste processing and disposal facility	Waste will be processed and disposed through proposed site of Rishikesh cluster.
Land availability for waste processing & Disposal facility	Land has been identified. After transfer of land, DPR will be prepared.
Approximate financial Requirement	Rs. 2569 Lakhs (For Rishikesh Cluster)
Time limit for setting up waste processing facility	Two year from sanction of funds.

**Time Line:** Proposal for solid waste processing and disposal facility has been submitted to Uttarakhand Urban Sector Development Agency (UUSDA) for funding. Proposed activity will be completed within two years from sanction of project.

No case 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.

### **6.3 Flood Plan Zone (FPZ):**

The Uttarakhand Irrigation Department carried out an assessment of flood plain zoning of river Suswa 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 Groundwater Recharge Measures:**

River Suswa gets significant dilution from the River Song at downstream of Doiwala, which increase natural flow of the river almost the year. Improvement in Water quality also observed in River Song at near Birla Mandir (upstream of Raiwala) before confluence with river Ganga. Effort would be made to maintain environmental flow in River Suswa/Song.

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 Suswa. Artificial lakes and ponds also help in ground water recharge. All the government will be directed to create a provision of roof top rain water harvesting provision for ensuring ground water recharge in the catchment of river Suswa.

### **6.5 Greenery Development:**

Extensive plantation activity was carried out in the year 2018 in order to regenerate natural flow of river Rispana. It is estimated that about 2.5 Lakhs sapling were planted in the year 2018. Similar exercise is also proposed in the year 2019. These activities would certainly augment natural water flow in the river.

### **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 Bhela Treated water channel may also linked with irrigation network in order to reduce ground water consumption for irrigation uses.

### **6.6 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:**

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

S.N.	Action plan for rejuvenation of river Suswa	Organisation/ Agency Responsible for Execution of the Action Plan	Time Target	Budgetary Requirement (Rs. In Lakhs)	Remarks
<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 / UEPPCB	One month	Nil	Continuous activity.
b)	Strengthening of Environment Surveillance Squad (ESS) of UEPPCB	UEPPCB	Two month (By Sept. 2019)	Nil	Continuous activity.
<b>2. Sewage Management:</b>					
<b>A. Upper catchment of River Suswa (Before Mothrawala):</b>					
a)	Tapping of 177 nos. of nalas/drain and 2901 nos. open household outlets on both banks of river Rispana.	Uttarakhand Peyjal Nigam	March, 2021	----	Proposed activities are sanctioned under Namami Gange programs.
b)	Carrier line of 30.88 Km and appurtenant works.				
c)	Construction of STP (1.0 MLD capacity)				
d)	Diversion structure of Bindal river to 68 MLD STP.				
<b>B. Mothrawala to Shyampur Area:</b>					
a)	Interception and	Uttarakhand	Two years	<b>5816.00</b>	Proposed

**Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun**

	diversion of 3- drains namely - Nala Sapera Basti; Nala Near Rajiv Gandhi International Stadium; and Nala Shyampur near Polytechnic.	Peyjal Jal Nigam	from sanction of funds.		activities will be completed in two years from sanction and release of funds. Project proposal has been submitted to NMCG for funding.
b)	Installation of 3-Nos. of STPs at - Nala Near Rajiv Gandhi International Stadium; and Nala Shyampur near Polytechnic.				
c)	Operation and Maintenance of 3 Nos. of STPs for 15 years; Operation and Maintenance of 3 Nos. I&D Works for 15 years; Land acquisition etc. expenses				
d)	Monitoring of STPs outlet effluent quality w.r.t. STPs effluent discharge norms prescribed under E(P) Rules, 1986 as amended.	UEPPCB	Complied. Monitoring already started. New STPs will be added.	Nil	Continuous activity.

**3. Solid Waste Management:**

**Nagar Nigam, Dehradun**

a)	Door to door collection of solid waste in all wards of town.	Nagar Nigam, Dehradun/ Nagar Palika Parisad, Doiwala	October, 2019	Nil	Under the supervision of Directorate of Urban Development
b)	Source segregation of wastes in all 40 wards of town.	Nagar Nigam, Dehradun/ Nagar Palika Parisad, Doiwala	April, 2020	Nil	
c)	Setting up Solid Waste	Nagar Nigam,	Operation	Nil	



**Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun**

	processing and disposal facility.	Dehradun	al		
<b>Nagar Palika Parisad, Doiwala</b>					
d)	Door to door collection of solid waste in all wards of town.	Nagar Palika Parisad, Doiwala	October, 2019	Nil	DPR of Rishikesh cluster has been submitted to Uttarakhand Urban Sector Development Agency for funding.
e)	Source segregation of wastes in all 40 wards of town.	Nagar Palika Parisad, Doiwala	April, 2020	Nil	
f)	Setting up Solid Waste processing and disposal facility.	Nagar Palika Parisad, Doiwala	Two years from sanction of funds.	<b>2569.00</b>	
g)	Utilisation of treated sewage for horti-agri activities, construction activity, irrigation by irrigation drainage channels of treated sewage, industrial activity	Peyjal Jal Nigam/ Irrigation Deptt./ Nagar Nigam, Dehradun/ Nagar Palika Parisad, Doiwala	One years	--	--
<b>4. Groundwater Quality</b>					
a)	Groundwater quality monitoring at silent points in the catchment of river Suswa during summer (May-June) and winter (December-January).	UEPPCB	Continuou s activity	-	Ground water monitoring will be done in Summer and winter month.
<b>5. Flood Plain Zone:</b>					
a)	Flood plain zoning of Suswa river.	State Irrigation Department	18 months from sanction of funds.	<b>86.76</b>	Proposal has been submitted to the State Govt.
b)	Prohibition on illegal disposal of waste and	District Administration/	Continuou s activity	-	Direction in this regard

**Action Plan for Rejuvenation of River Suswa (Mothrawala to Raiwala), Dehradun**

	removal of encroachment from river banks.	Nagar Nigam, Dehradun/Nagar Palika Parisad, Doiwala			has already been issued by Urban Development Directorate. It will be monitored regularly.
<b>6. Environmental Flow:</b>					
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
<b>7. Green Development:</b>					
a)	Development of green coverage along the Suswa river and its catchment	Forest Deptt.	Two year	--	--

\*\*\*\*\*