सत्यमेव जयते

भारत सरकार

Government of India

जल शक्ति मंत्रालय

Ministry of Jal Shakti

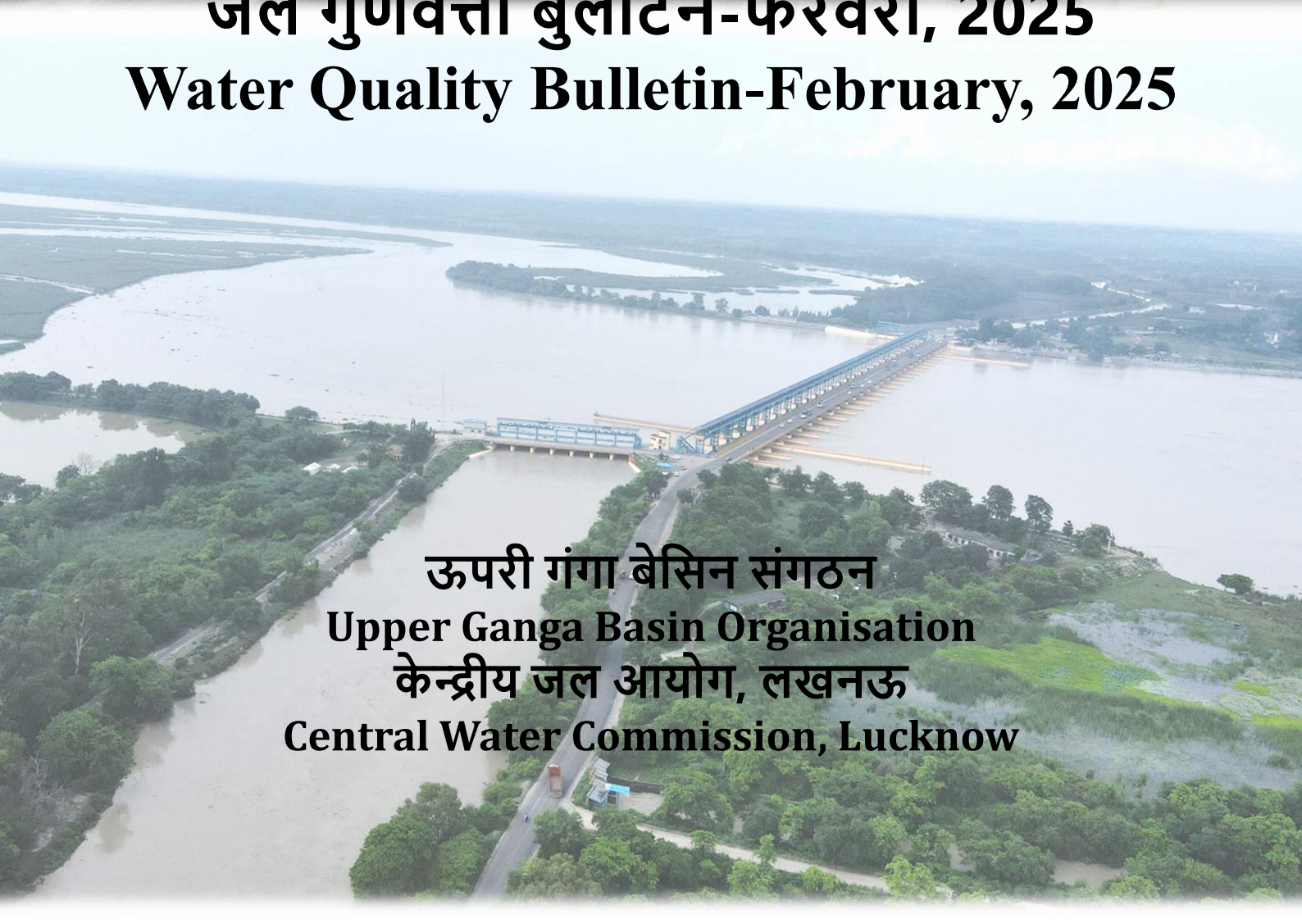
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग

Department of Water Resources

River Development and Ganga Rejuvenation

जल गुणवत्ता बुलेटिन-फरवरी, 2025

Water Quality Bulletin-February, 2025



ऊपरी गंगा बेसिन संगठन

Upper Ganga Basin Organisation

केन्द्रीय जल आयोग, लखनऊ

Central Water Commission, Lucknow

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1-INTRODUCTION

Water quality refers to the physical, chemical, biological and radiological characteristics of water, usually in relation to its suitability for a particular purpose, such as drinking, recreation, agriculture, or supporting aquatic life. Monitoring river water quality is essential for protecting human health, supporting ecosystems, sustaining economic activities and ensuring the long-term sustainability of water resources. It enables informed decision-making, proactive management, and timely responses to environmental threats, contributing to the overall well-being of society and the environment. The quality of water is influenced by natural factors like geology, climate, and vegetation, as well as human activities including industrial processes, agriculture and urbanization.

Importance of Monitoring River Water Quality:

- **Public Health:** Rivers are a source of drinking water for many communities. Monitoring ensures that harmful contaminants are identified and managed to protect human health.
- **Environmental Protection:** River's support diverse ecosystems. Regular monitoring helps detect pollution early and protects aquatic life from harmful effects.
- **Compliance with Regulations:** Many regions have environmental regulations that set water quality standards. Monitoring ensures compliance with these laws and helps avoid penalties.
- **Resource Management:** Water is a finite resource. Monitoring helps manage river ecosystems sustainably, ensuring they remain healthy and available for future generations.
- **Early Detection of Pollution:** Continuous monitoring allows for the early detection of pollutants, enabling timely responses to prevent long-term damage.
- **Research and Data Collection:** Monitoring provides valuable data for research into river ecosystems and human impact on water quality, informing policies and best practices.
- **Community Awareness and Engagement:** Monitoring can raise awareness among local communities about the health of their rivers, fostering engagement in conservation efforts.

Overall, river water quality monitoring is a critical component of environmental stewardship and public health, providing insights and data to guide decision-making and action to maintain clean and safe waterways. Human influence on the quality of water is quite apparent and is now a major concern. Mixing with municipal and industrial waste water may result in drastic changes in the water quality of natural waters. Agriculturally oriented activities such as irrigation, use of fertiliser, pesticides, herbicides, etc., may lead to diffuse pollution of both surface waters and ground water. Irrigation returned waters also tend to increase total salts in the receiving water. Construction schemes, such as those connected with river training, flood control, low flow augmentation, etc., considerably influence the quality regime. Mining activities often cause substantial water quality changes. Thus, it has become inevitable to monitor the quality of river water.

Purpose of water quality bulletin:

Rapidly increasing population, rising standard of living, exponential growth of industrialized and urbanization have exposed the Water Resources in general and rivers in particular to various form of degradation. It is therefore necessary to keep vigilant watch of quality of available fresh waters whose major sources in our country are rivers. Water Quality Bulletin provides a numerical and graphical information the expresses the quality of water for several parameters in a simple understanding way. It gives a general idea on the possible problems with the water in the region.

Significance of rivers under UGBO:

The Ganga River basin is the largest river basin in India in terms of catchment area, constituting 26% of the country's land mass and supporting about half a billion populations. The drainage area of the basin lies in Uttarakhand, Uttar Pradesh, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, Rajasthan, West Bengal, Haryana, Himachal Pradesh and the Union Territory of Delhi. It traverses a course of 2525 km before flowing into the Bay of Bengal. It has a large number of tributaries joining it during this journey. The main physical sub-divisions are the Northern Mountains, the Gangetic Plains and the Central Highlands. Northern Mountains comprises the Himalayan ranges including their foot hills. The Gangetic plains, situated between the Himalayas and the Deccan plateau and covering most of the basin, are ideally suited for intensive cultivation.

River Ganga has been a sign of divinity, spirituality and purity. The river Ganga and its watershed supports one of the most fertile and densely populated regions. It is believed that bathing in holy water of Ganga washes all the past sins of a person, and one drop of water if given to a person at the time of death will elevate the soul to heaven. There are many pilgrimages along the river Ganga, which have particular importance. Among those the confluence of the Ganga, the Yamuna and the mythical Saraswati at Prayagraj known as Triveni Sangam has its own significance, where a bathing festival or Mela is held in the month of January and February every year. Historically the Gangetic plain has constituted the heartland of India and its successive civilizations.

The Ganga River originates from the southern great Himalayas in Uttarakhand on the Indian side of the border with Tibet in the Himalayan region. The Ganga River is formed by the five headstreams, namely the Bhagirathi, the Alaknanda, the Mandakini, the Dhauliganga and the Pindar. Of those, the two major headstreams are the Alaknanda and the Bhagirathi, which receives both monsoon as well as glacial melt water from the Himalayan glaciers known as Gangotri. Gangotri itself is a sacred place for Hindu pilgrimage. The major tributaries of Ganga are also originating from the Himalaya excluding Sone and the Damodar that originates from the Amarkantak hills of Maikal range and Chota Nagpur Plateau, respectively. The Alaknanda and Bhagirathi River joins at Devprayag in Uttarakhand to form the river Ganga which acts as a single stream which cuts south westward through the Shivalik Range at the northern edge of Indo-Gangetic plain to emerge from the mountains at Rishikesh. After traveling a few kilometres from Rishikesh, she enters into a plain at Haridwar, a sacred place for Hindus. From the origin after traversing about 2525 km it empties into the Bay of Bengal at Ganga Sagar Island.

At Prayagraj River ganga receives its biggest tributary, the river Yamuna from right. Varanasi is situated on the left bank of the river Ganga about 150 km downstream of Prayagraj. The river Gomti joins river Ganga after Varanasi from left. After leaving Uttar Pradesh, the river Ganga enters Bihar in the Bhijpur district and receives two important tributaries, the river Ghaghra from the left at Chhapra and the Sone from the right at Maner. The river Gandak, yet another left tributary, joins river Ganga at Patna. At Pathar Ghat in Sahrasa district, the river receives the river Kosi, an important left bank tributary. After its confluence with the river Kosi, the Ganga continues its eastward flow in Bihar for about 40 km and enters West Bengal and swings round the Rajmahal hill and starts flowing almost south. The delta of the river Ganga can be said to start from Farakka in West Bengal.

Here are the key characteristics of the Ganga and its tributaries:

Origin and Geography: The Ganga originates from the Gangotri Glacier in the Himalayas at Gaumukh, Uttarakhand. It flows through northern India, passing through states like Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal, before entering Bangladesh and emptying into the Bay of Bengal.

Major Tributaries: The Ganga has several significant tributaries, including the Yamuna, Ghaghara, Gandak, Kosi, Son, and Chambal, among others. Each tributary has unique characteristics, contributing to the Ganga's flow and basin diversity.

Cultural and Religious Significance: The Ganga is considered sacred in Hinduism, with millions of devotees visiting its banks for rituals and ceremonies. Major religious sites like Varanasi, Haridwar and Prayagraj are located along the river.

Economic Importance: The Ganga and its tributaries are crucial for agriculture, providing irrigation to one of the most fertile regions in India. The river system supports fishing, transportation, and other economic activities.

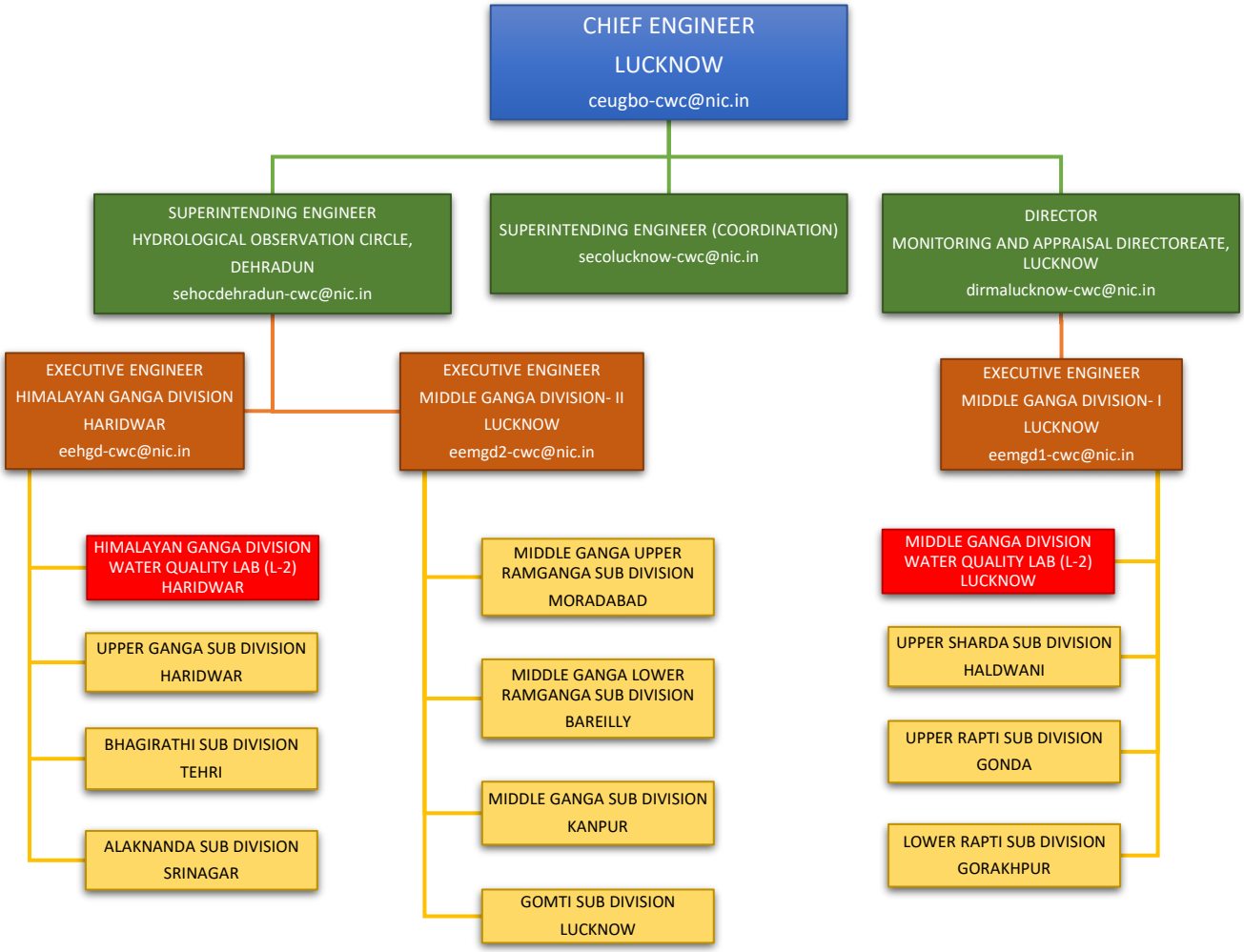
Environmental Diversity: The Ganga basin includes various ecosystems, from Himalayan forests to fertile plains, supporting diverse flora and fauna. It is home to endangered species like the Ganges River dolphin and the gharial (a type of crocodile).

Challenges and Pollution: The Ganga faces significant pollution challenges due to industrial discharge, sewage, agricultural runoff, and religious activities. Efforts like the National Mission for Clean Ganga aim to address these issues and restore the river's health.

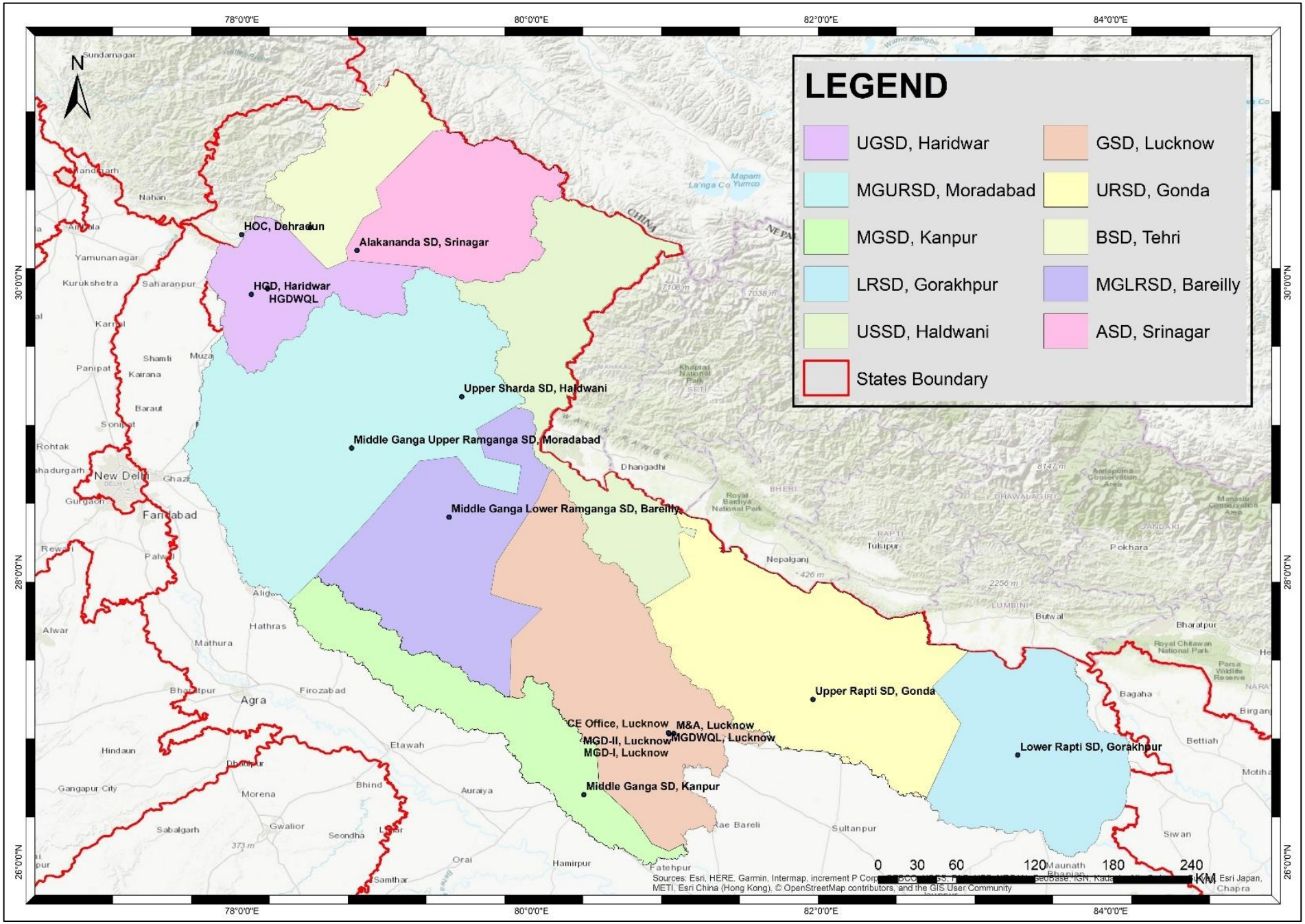
Hydrological Dynamics: The river experiences seasonal variations in flow, with the monsoon season causing significant increases in water levels. This dynamic flow supports agriculture but also brings risks of flooding.

These characteristics highlight the Ganga's complex role in India's cultural, economic, and environmental landscape, emphasizing the need for sustainable management and conservation efforts.

2-ORGANISATIONAL SET-UP



Upper Ganga Basin Organization (UGBO) is one of the fourteen Regional Organisations (RO) of the River Management (RM) Wing of Central Water Commission. The jurisdiction of UGBO covers Ganga Basin up to Bhitaura & Ghaghra basin up to Turtipar in Uttar Pradesh. The organizational set up of UGBO which deals with matter related to Water Quality has been described in above chart. At the helm of this structure is the Chief Engineer who is the head of the RO. Organization is divided in two Circles which are further divided in Divisions and Sub-Divisions. Superintending Engineer (Coordination) assists Chief Engineer in discharge of his functions. The Hydrological Observation Circle office, Dehradun controls two Divisions, Himalayan Ganga Division, Haridwar and Middle Ganga Division-II, Lucknow and M&A, Lucknow Circle office controls Middle Ganga Division-I, Lucknow. The Himalayan Ganga Division Water Quality Laboratory (Level-II) is operational in Haridwar and Middle Ganga Division Water Quality Laboratory (Level-II) is operational at MGD-1, Lucknow. Samples collected from Himalayan Ganga Division are tested in HGDWQL whereas samples from Middle Ganga Division-I and Middle Ganga Division-II are tested in MGDWQL.


LEGEND
UGSD, Haridwar
MGURSD, Moradabad
MGSD, Kanpur
LRSD, Gorakhpur
USSD, Haldwani
States Boundary
GSD, Lucknow
URSD, Gonda
BSD, Tehri
MGLRSD, Bareilly
ASD, Srinagar
HOC, Dehradun
Alakananda SD, Srinagar
HGD, Haridwar
HGDWQL
Upper Sharda SD, Haldwani
Middle Ganga Upper Ramganga SD, Moradabad
Middle Ganga Lower Ramganga SD, Bareilly
Upper Rapti SD, Gonda
Lower Rapti SD, Gorakhpur
CE Office, Lucknow
M&A, Lucknow
MGD-II, Lucknow
MGDWQL, Lucknow
MGD-I, Lucknow
Middle Ganga SD, Kanpur
78°0'0"E
80°0'0"E
82°0'0"E
84°0'0"E
30°0'0"N
28°0'0"N
26°0'0"N
0 30 60 120 180 240 KM
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, and the GIS User Community

Description of Organisation:

There are total 148 Hydrological Observation (HO) Stations under jurisdiction of UGBO where collection and compilation of Gauge (G)/ Discharge (D)/ Sediment (S)/ Water Quality (Q) data is carried out. Water samples for water quality testing are collected for 39 HO sites as well as 33 Water Quality Sampling Stations (WQSS), total 72 samples. Division wise distribution of sites is as below:

Table 1: Division-wise Water Quality sites

S N	Division	No. of HO stations (Q)	No. of WQSS	Total
1	HGD, Haridwar	7	15	22
2	MGD-I, Lucknow	13	7	20
3	MGD-II, Lucknow	19	11	30
	Total	**39**	**33**	**72**

Facilities of Laboratories under UGBO:

The laboratory's role is offering one-stop solutions for water quality is essential, implying that HGDWQL and MGDWQL provides a broad spectrum of services that encompass the entire process of assessing and managing water quality. The laboratory is accredited. HGDWQL and MGDWQL are NABL accredited in the Chemical disciplines as per ISO/IEC 17025:2017 for 12 and 14 parameters respectively. These laboratories are Level-II laboratory and analyses 23 physio-chemical and 02 biological parameters of river water as per the Standard Methods for the Examination of Water and Wastewater, APHA, 23rd edition.

Table 2: List of equipment parameter-wise

S. No.	Water Quality Parameters	Instruments Used
1	Temperature	Thermometer
2	pH	pH Meter
3	Electrical Conductivity	Conductivity Meter
4	Total Dissolved Solids	Conductivity Meter
5	Turbidity	Nephalo-Turbidity Meter
6	Sodium	Flame Photometer
7	Calcium	Digital Burette
8	Magnesium	Digital Burette
9	Potassium	Flame Photometer
10	Carbonate	Digital Burette
11	Bicarbonate	Digital Burette
12	Chloride	Digital Burette
13	Sulphate	Nephalo-Turbidity Meter
14	Fluoride	Ion Meter
15	Boron	Spectrophotometer
16	Silicate	Spectrophotometer
17	Ammonical Nitrogen	Spectrophotometer
18	Nitrate	Ion Meter
19	Nitrite	Spectrophotometer
20	Phosphate	Spectrophotometer
21	DO	Digital Burette

22	BOD	Digital Burette
23	COD	COD Reactor & COD Photometer
24	Total Coliform	Incubators, Biosafety Cabinet
25	Fecal Coliform	Incubators, Biosafety Cabinet

Table 3: Additional Equipment used in lab

S.No.	Name of Instrument	Work in Laboratory
1	Hot Air Oven	For drying some chemicals and glassware
2	Deep Freezer	For storing water samples at 4 ^{0}C
3	Refrigerator	For storing Chemicals and CRM's
4	Air Conditioner	For maintain laboratory temprature
5	Hygrometer	For humiditry and temperature
6	Double Distillation Unit	For preparing distilled water

Table 4: Parameters for which lab is NABL accredited

Sl. No.	Water Quality Parameter	NABL for MGDWQL	NABL for HGDWQL
1	pH	Y	Y
2	Electrical conductivity	Y	Y
3	Calcium Hardness	Y	Y
4	Magnesium Hardness	Y	Y
5	Chloride	Y	Y
6	DO	Y	Y
7	BOD	Y	Y
8	Sodium	Y	Y
9	Potassium	Y	Y
10	Sulphate	Y	Y
11	Total Hardness	Y	Y
12	Total alkalinity	Y	Y
13	Nitrate	Y	
14	Fluoride	Y	

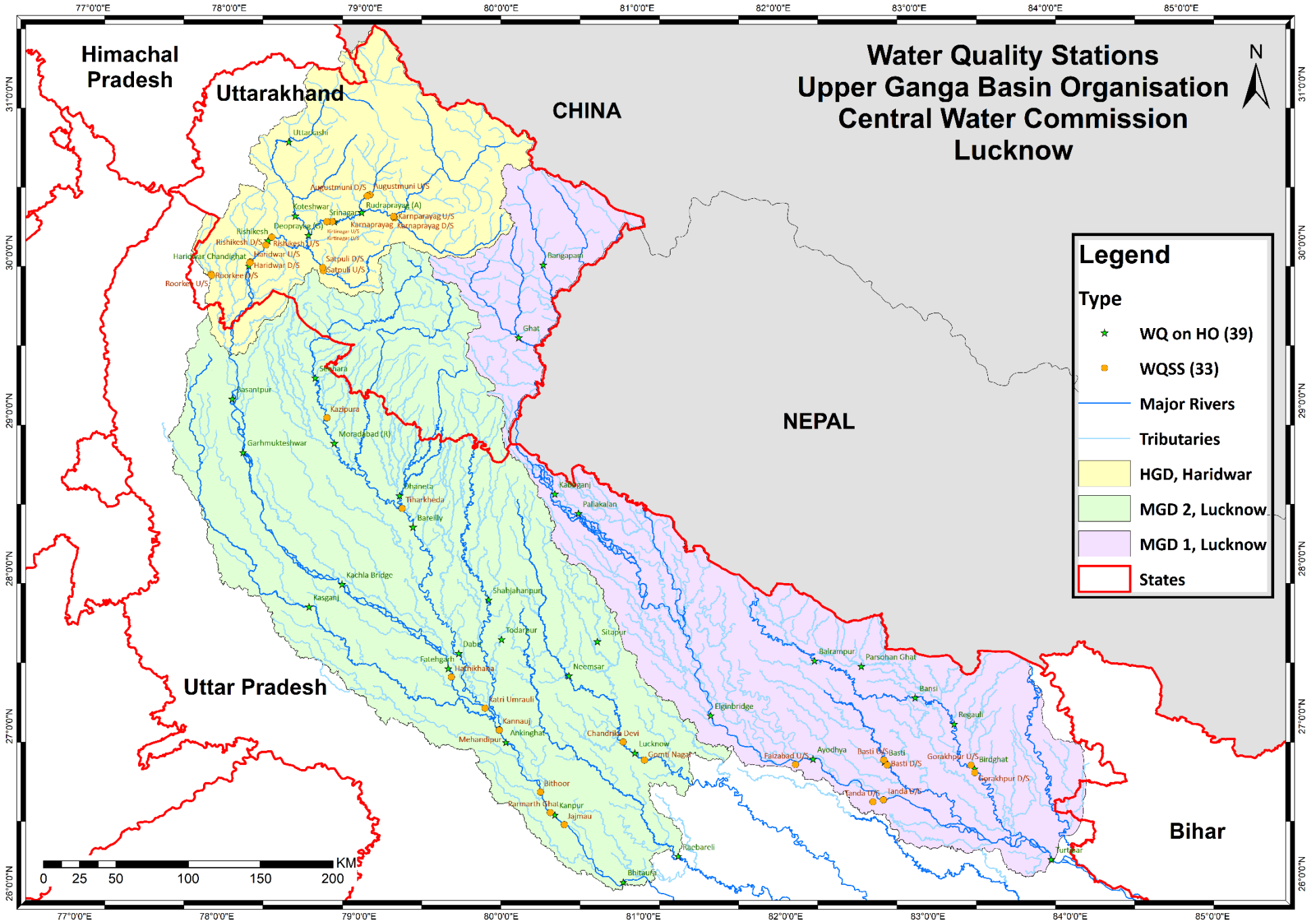
Table 5: List of Water Quality Sites under UGBO

S N	Water Quality Station	Circle	Division	Basin	River	State	District	Site Type	Latitude	Longitude
	HGDWQL									
1	Karnaprayag Confluence U/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda	UK	Chamoli	WQSS	30.263889	79.2175
2	Karnaprayag	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda/ Pinder	UK	Chamoli	WQSS	30.255	79.22111
3	Karnaprayag Confluence D/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda	UK	Chamoli	WQSS	30.264722	79.214444
4	Augustmuni D/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda/ Mandakini	UK	Rudraprayag	WQSS	30.392222	79.021944
5	Augustmuni U/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda/ Mandakini	UK	Rudraprayag	WQSS	30.4000	79.041667
6	Rudraprayag (A)	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda	UK	Rudraprayag	GDSQ	30.28806	78.9842
7	Srinagar	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda	UK	Pauri Garhwal	GDSQ	30.2280556	78.7863889
8	Kirtinagar U/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda	UK	Tehri Garhwal	WQSS	30.229722	78.766944
9	Kirtinagar D/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Alaknanda	UK	Tehri Garhwal	WQSS	30.228889	78.729722
10	Uttarkashi	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Bhagirathi	UK	Uttarkashi	GDSQ	30.729167	78.446944
11	Koteshwar	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Bhagirathi	UK	Tehri Garhwal	GDSQ	30.265783	78.503149
12	Devprayag (G)	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga	UK	Pauri Garhwal	GDSQ	30.14056	78.596944
13	Satpuli U/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Nayar	UK	Pauri Garhwal	WQSS	29.918889	78.707222
14	Satpuli D/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Nayar	UK	Pauri Garhwal	WQSS	29.9375	78.702222
15	Rishikesh U/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga	UK	Dehradun	WQSS	30.126389	78.329444
16	Rishikesh	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga	UK	Dehradun	GDSQ	30.10321	78.30344
17	Rishikesh D/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga	UK	Dehradun	WQSS	30.075833	78.286944
18	Haridwar U/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga	UK	Haridwar	WQSS	29.9675	78.176389
19	Haridwar	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga	UK	Haridwar	GDSQ	29.9425	78.18194
20	Haridwar D/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga	UK	Haridwar	WQSS	29.962778	78.173056
21	Roorkee U/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Solani	UK	Haridwar	WQSS	29.886389	77.890833
22	Roorkee D/S	HOC, Dehradun	HGD, Haridwar	Ganga	Ganga/Solani	UK	Haridwar	WQSS	29.880278	77.8975

S N	Water Quality Station	Circle	Division	Basin	River	State	District	Site Type	Latitude	Longitude
	MGDWQL									
1	Basantpur	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Bijnaur	GDSQ	29.10297	78.098681
2	Garhmukteshwar	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Ghaziabad	GDSQ	28.761357	78.142637
3	Kachhlabridge	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Badaun	GDSQ	27.93194	78.8625
4	Fatehgarh	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Farrukkhabad	GDSQ	27.40139	79.6230556
5	Hathikhana	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Fatehgarh	WQSS	27.347862	79.643568
6	Katriumrauli	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Kannauj	WQSS	27.150551	79.88386
7	Mehandipur	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Kannauj	WQSS	27.010099	79.985458
8	Ankinghat	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Kanpur Nagar	GDSQ	26.93308	80.032835
9	Bithoor	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Kanpur	WQSS	26.616873	80.275578
10	Parmarthghat	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Kanpur	WQSS	26.4872	80.3445
11	Kanpur	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Kanpur	GDSQ	26.47221	80.378662
12	Jajmau	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Kanpur	WQSS	26.409428	80.443801
13	Bhitaura	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga	UP	Fatehpur	GDSQ	26.04194	80.859444
14	Shahjahanpur	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Deoha (Garra)/ Khannaut	UP	Shahjahanpur	GDSQ	27.83694	79.909979
15	Todarpur	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Deoha (Garra)/ Sukheta	UP	Hardoi	GDSQ	27.58641	80.002337
16	Kasganj	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Kali	UP	Kasganj	GDSQ	27.78722	78.6275
17	Kannauj	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Kali	UP	Kannauj	WQSS	27.0208	79.9836
18	Seohara	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Ramganga	UP	Bijnaur	GDSQ	29.23889	78.656875
19	Kazipura	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Ramganga	UP	Moradabad	WQSS	28.987129	78.74173
20	Moradabad (R)	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Ramganga	UP	Moradabad	GDQ	28.825516	78.798315
21	Dhaneta	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Ramganga/ Kichha(Gaula)	UP	Bareilly	GDSQ	28.49694	79.2544444
22	Tiharkheda	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Ramganga	UP	Bareilly	WQSS	28.416358	79.288253
23	Bareilly	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Ramganga	UP	Bareilly	GDSQ	28.2975	79.3675
24	Dabri	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Ramganga	UP	Shahjahanpur	GDSQ	27.49778	79.6969444
25	Sitapur	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Gomti/ Sarayan	UP	Sitapur	GDSQ	27.57199	80.685793

S N	Water Quality Station	Circle	Division	Basin	River	State	District	Site Type	Latitude	Longitude
26	Raebareli	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Gomti/Sai	UP	Raebareli	GDQ	26.20335	81.24669
27	Neemsar	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Gomti	UP	Sitapur	GDQ	27.355	80.480833
28	Chandrika Devi	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Gomti	UP	Lucknow	WQSS	26.93321	80.862697
29	Lucknow	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Gomti	UP	Lucknow	GQ	26.86206	80.94609
30	Gomtinagar	HOC, Dehradun	MGD-2, Lucknow	Ganga	Ganga/Gomti	UP	Lucknow	WQSS	26.817208	80.01403
31	Bangapani	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Sharda/Gauriganga	UK	Pithoragarh	GDSQ	29.9595	80.3044
32	Ghat	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Sharda/Saryu	UK	Pithoragarh	GDQ	29.4987	80.1258
33	Kabirganj	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Sharda	UP	Pilibhit	GDSQ	28.5085	80.3844
34	Paliakalan	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Sharda	UP	Lakhimpur Kheri	GDSQ	28.3849	80.5534
35	Basti U/S	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Kwano	UP	Basti	WQSS	26.7975	82.7078
36	Basti	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Kwano	UP	Basti	GDQ	26.7844	82.7126
37	Basti D/S	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Kwano	UP	Basti	WQSS	26.7653	82.7325
38	Parsohan Ghat	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Rapti/Burhi Rapti	UP	Siddharthnagar	GDSQ	27.3954	82.5625
39	Balrampur	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Rapti	UP	Balrampur	GDSQ	27.4354	82.2295
40	Bansi	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Rapti	UP	Siddharthnagar	GDQ	27.1892	82.9401
41	Regauli	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Rapti	UP	Gorakhpur	GDSQ	27.0162	83.2123
42	Gorakhpur U/S	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Rapti	UP	Gorakhpur	WQSS	26.7525	83.3242
43	Birdghat	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/	UP	Gorakhpur	GDSQ	26.7298	83.3499

S N	Water Quality Station	Circle	Division	Basin	River	State	District	Site Type	Latitude	Longitude
					Rapti					
44	Gorakhpur D/S	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra/ Rapti	UP	Gorakhpur	WQSS	26.7056	83.3497
45	Elgin Bridge	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra	UP	Barabanki	GDSQ	27.0952	81.4861
46	Faizabad U/S	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra	UP	Ayodhya	WQSS	26.7786	82.0817
47	Ayodhya	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra	UP	Ayodhya	GDSQ	26.8111	82.2075
49	Tanda U/S	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra	UP	Basti	WQSS	26.545	82.6997
48	Tanda D/S	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra	UP	Ambedkar Nagar	WQSS	26.545	82.6997
50	Turtipar	M&A, Lucknow	MGD-I, Lucknow	Ganga	Ganga/Ghaghra	UP	Ballia	GDSQ	26.1411	83.8749


Water Quality Stations
Upper Ganga Basin Organisation
Central Water Commission
Lucknow
N
Himachal Pradesh
Uttarakhand
CHINA
NEPAL
Uttar Pradesh
Bihar
Legend
Type
WQ on HO (39)
WQSS (33)
Major Rivers
Tributaries
HGD, Haridwar
MGD 2, Lucknow
MGD 1, Lucknow
States
Uttarkashi
Augustmuni D/S
Augustmuni U/S
Koteshwar
Srinagar
Rudraprayag (A)
Karnaprayag U/S
Deoprayag (A)
Karnaprayag
Karnaprayag D/S
Rishikesh
Rishikesh D/S
Rishikesh U/S
Haridwar Chandighat
Haridwar U/S
Haridwar D/S
Satpuli D/S
Satpuli U/S
Roorkee D/S
Roorkee U/S
Bangapani
Ghat
Basantpur
Kazipura
Moradabad (R)
Garhmukteshwar
Dhaneta
Tiharkheda
Bareilly
Kachla Bridge
Kasganj
Shahjahanpur
Todarpur
Dabri
Fatehgarh
Hathikhana
Neemsar
Sitapur
Katri Umrauli
Kannauj
Ankinghat
Mehandipur
Chandrika Devi
Lucknow
Gomti Nagar
Bithoor
Ramarth Ghat
Kanpur
Jajmau
Bhitaura
Kaiserganj
Paliakalan
Balrampur
Parsohan Ghat
Bansi
Regauli
Elginbridge
Faizabad U/S
Ayodhya
Basti U/S
Basti
Basti D/S
Gorakhpur U/S
Birdghat
Gorakhpur D/S
Tanda U/S
Tanda D/S
Turtipar
KM
0 25 50 100 150 200
77°0'0"E
78°0'0"E
79°0'0"E
80°0'0"E
81°0'0"E
82°0'0"E
83°0'0"E
84°0'0"E
85°0'0"E
31°0'0"N
30°0'0"N
29°0'0"N
28°0'0"N
27°0'0"N
26°0'0"N

3-GANGA AND ITS TRIBUTARIES UNDER UGBO

Pinder river is tributary of river Alaknanda. It originates from the glacier near Nandakot peak in Chamoli district. It flows in south direction, then south-west and then north- west and joins river Alaknanda at left bank in Karnaprayag. The two hydrological observation stations on this river are Nandkeshri and Karnaprayag.

Mandakani River is tributary of river Alaknanda. It originates from Kedarnath hills in Rudraprayag district of Uttarakhand. Initially, it flows in south-west direction till Tilwara, later on in south-east and joins river Alaknanda at right bank in Rudraprayag. The two hydrological observation stations on this river are Ganganagar and Rudraprayag.

Nayar River is tributary of river Ganga. It emerges from Dudhatoli ranges of Garhwal in Pauri district of Uttarakhand. Initially, it flows in south direction then slowly turns in south-west and later in west direction and joins river Ganga at left bank near Vyas Ghat. The hydrological observation station on this river is Marora.

Ramganga River is a tributary of Ganga, which emerges from Dudhatoli ranges in Pauri Garhwal District of Uttarakhand. Ramganga flows through various places and consolidates many places into one. It passes through Taal, Chaukhutia, Bhagoti, Masi, Bhikyasen etc. which comes under Kumaon region. It passes through Corbett National Park, near Ramnagar in Nainital district and ascends to the plains. The cities alongside the banks of Ramganga River are Moradabad, Bareilly, Badaun, Shahjahanpur and Hardoi of Uttar Pradesh state. After Kalagarh dam, Ramganga flows in the southeast direction and finally joins Ganga on its left bank, near Kanauj. The important tributaries of Ramganga are Kho, Baigul, Gangan, Aril, Kosi and Deoha also known as Garra.

Kosi River is one of the major tributaries of river Ramganga and is one of the important rivers of northern part of Uttar Pradesh and Uttrakhand. The major areas, which are parts of Kosi River basin, are Tota-aam and Garajiya in Almora, city Ramnagar (Distt. Nainital), Kashipur (Distt. Udhamsingh Nagar), Dadiyal, Swar, Lalpur, and city Rampur. The river Kosi originates from village Budha Peenath of Kausani region of district Almora (UK). After traveling in lower Himalayas with higher velocity, it emerges at Ramnagar in Indo-Gangetic Plains, after which the velocity reduces considerably. In the initial stretch through the Shivalik range of Himalayas, it takes water from a number of major streams, and a major portion is diverted into a canal for irrigation purposes. After Ramnagar, it flows through the famous rice-belt area of Kashipur.

Gomti river originates near Mainkot, about 3 km east of the Pilibhit town in Uttar Pradesh, at an elevation of 200 m. The river drains the area between Ramganga and Ghaghra systems. It flows entirely in the State of Uttar Pradesh. The river flows through Shahjahanpur, Kheri, Lucknow, Barabanki, Sultanpur, Faizabad, Jaunpur, Varanasi and Ghazipur districts before merging into the Ganga about 6 km upstream of Saidpur town located on border of Varanasi and Ghazipur districts. Lucknow, the capital city of Uttar Pradesh, is situated on the banks of the Gomti River. The main tributaries of the Gomti River are the Gachai, the Sai, the Jomkai, the Barna, the Chhuha and the Kalyani.

Ghaghra river is a major tributary of river Ganga. The upper half of Ghaghra lies in Nepal and the lower half in Uttar Pradesh. The Ghaghra is called Karnali or Manchu in upper reaches and has its origin in the Himalayan glaciers about 60 km south west of Mansarover. After flowing in south-east direction, the river enters Nepal territory. The river continues its serpentine course before confluence with the river Mugu and Tila on its left bank. After flowing for another 25 km, below its confluence with the Tila, the river takes a winding course till Churighat, thereafter it takes almost a westerly course till it reaches Dundras. At this point, the river takes “U” turn and starts flowing in south-east direction till it debouch

into the plains of Nepal after passing through a narrow gorge in the Shivalik range of hills. In this reach, two more tributaries viz. the Seti on right bank near Banganga and the Bheri on its left bank near Jamu join the river. As the river enters the plains area, it divides into several channels, the more important of which are the “Kauriala” and the “Girwa”. Both the Kauriala and the Girwa channels rejoin at Bharatpur in the district of Bahraich of Uttar Pradesh. The river bed from this point onwards is sandy and its course is liable to abrupt changes. Near Gularia the river receives the Suheli on its right bank and Babai Sarju meets furthers downstream on its left bank. The Sharda or “Chuka” the most important tributary of the Ghaghra join the Kauriala at Mathura.

After the confluence with the Sharda, the river is known as Ghaghra and flows in south-easterly direction. Earlier it forms the boundary between Bahraich and Gonda district. The lower Sarju and Tirhi River join the Ghaghra in Gonda district. During its course through Gonda district, the river inundates a large area on its left by spilling its flood water into the river Sarju, Tirhi etc. The Tirhi joins the Ghaghra (known as Sarju in Ayodhya) about 20 km. below Ayodhya. The flood water of river Ghaghra is being controlled by Girija Barrage. This is situated at the up-stream of B.K. Ghat (Katerniaghat) site in district Bahraich and maintained by State Government of Uttar Pradesh. Near Dhuriapur, river Kwano joins the Ghaghra on its left. The river Rapti also joins from the left about 5 km west of Barhaj town. The chhoti Gandak joins the Ghaghra at about 3 km on its left bank. South of Godhini village, Ghaghra forms a boundary between Bihar and Uttar Pradesh. After receiving two small rivers Jhorahi and Doha on its left, river Ghaghra finally confluences with the river Ganga few km down-stream of Chapra in Bihar.

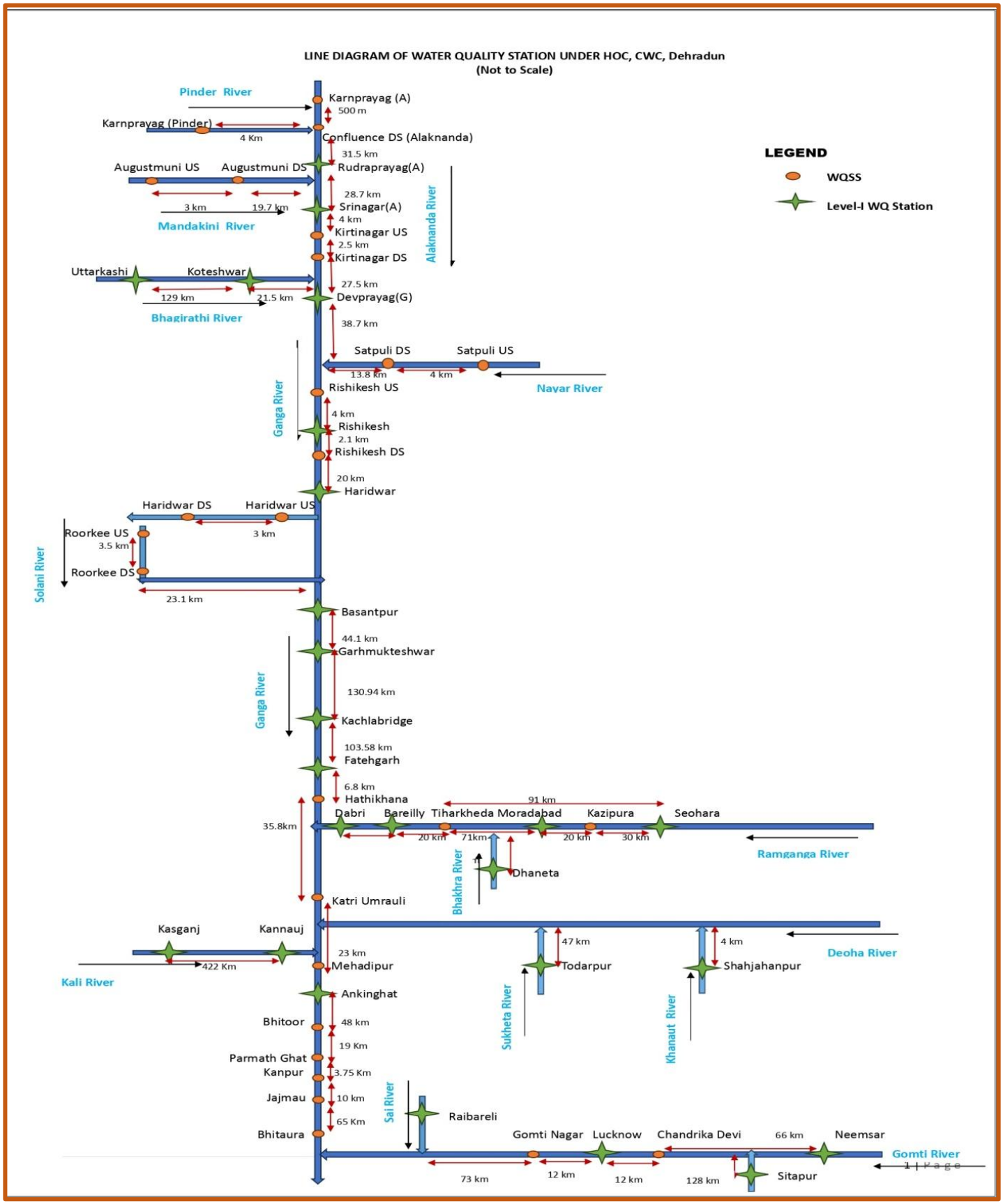
Sharda river is important tributary of right bank of river Ghaghra. It is formed by a combination of a number of tributaries near Burmadeo Mandi in Nepal and enters in the plains area near Sarkhana village. Its tributaries are Kali, Khopang, Saryu, Ladiya and Uil rivers on the right bank and Chamlia river on the left bank. It flows in the districts Almora, Pithoragarh & Champawat in Uttarakand and Pilibhit, Lakhimpur Kheri and Sitapur in U.P. It joins the river Ghaghra at up-stream of Elgin Bridge site in District Barabanki. Sharda Barrage is situated at the up-stream of Shardanagar site in district Lakhimpur Kheri and maintained by State government of Uttar Pradesh.

Rapti river is important left bank tributary of the Ghaghra. It rises in Nepal at an elevation of about 3048 m. in the Dregaunra range. Rapti barrage is situated at the up-stream of Bhinga in district Shravasti and maintained by State government of Uttar Pradesh.

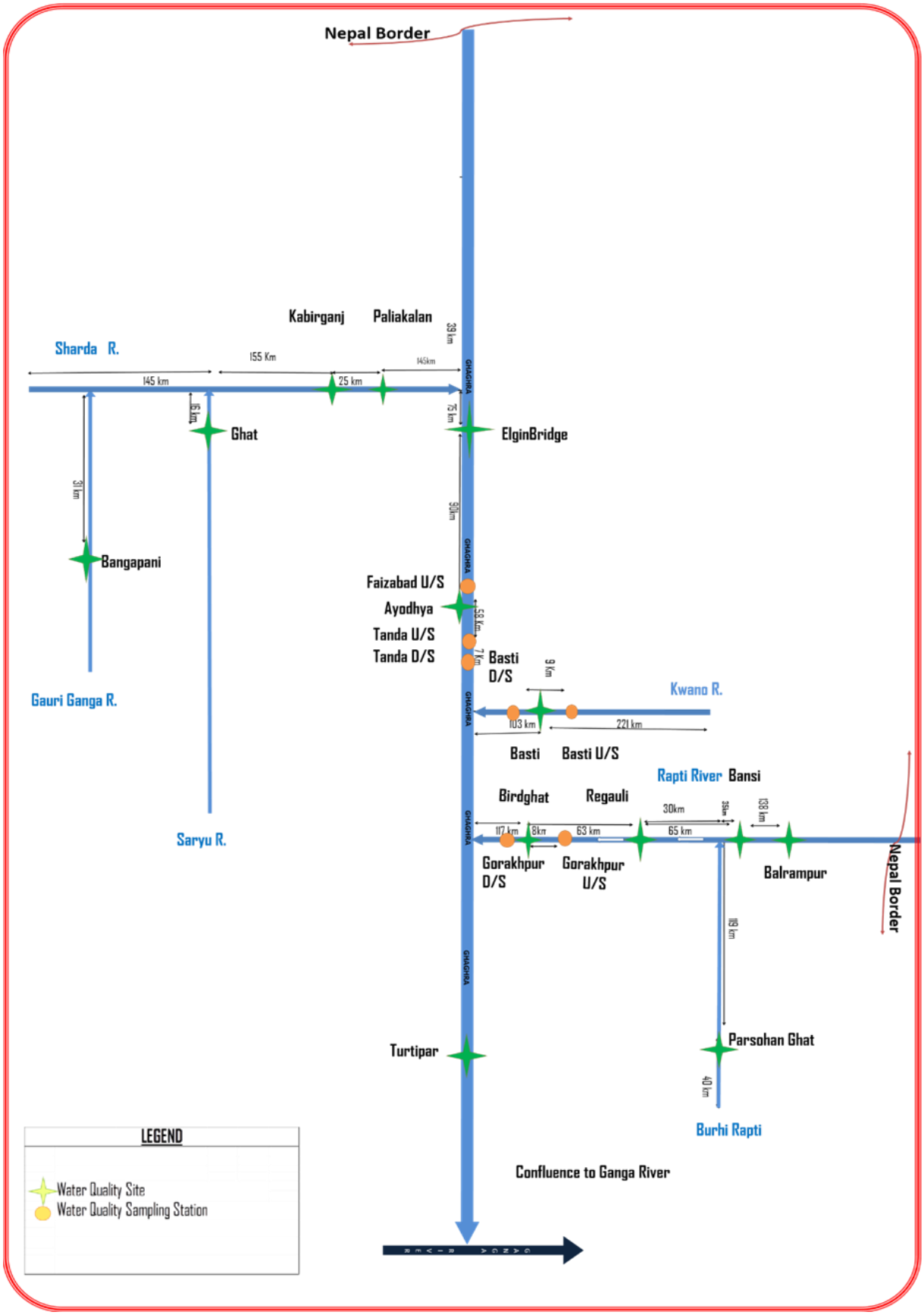
Burhi Rapti river is a tributary of the river Rapti. It rises in the Dundwa range at an elevation of about 914.4 m. and has a steep drop of about 609 m from 16.1 km. of its flow. It flows roughly parallel to Rapti and in high floods it inundates a large area. It joins the river Rapti near the village Balashir in district Basti. The tributaries of Burhi Rapti are mostly non-perennial streams except the Banganga.

Kwano river is a rain fed river and originates from Kwano hills in the district Bahraich of Uttar Pradesh. It joins river Ghaghra near the place Raunapar in the midway of the boundary of the districts Azamgarh and Sant Kabir Nagar. It passes through Gonda, Basti and Sant Kabir Nagar districts.

Comprehensive Line diagram for River Ganga and its tributaries under UGBO:



Comprehensive Line diagram for River Ghaghra and its tributaries under UGBO:



4-WATER QUALITY PARAMETERS, STANDARDS, SAMPLE COLLECTION AND METHODOLOGY

Parameters and their significance:

pH (Potential of Hydrogen):
pH indicates the acidity or alkalinity of water. It affects aquatic life and the ability of substances to dissolve in water.

Electrical Conductivity (EC):
EC measures the ability of water to conduct electricity, which correlates with the total dissolved solids (TDS). It indicates the overall mineral content and salinity of water.

Fluoride (F-):
Fluoride levels are crucial for dental health. High concentrations can lead to dental fluorosis, while low concentrations may not prevent tooth decay.

Ammonia as N (NH3-N):
Ammonia levels indicate organic pollution or the breakdown of organic matter in water. High levels can be toxic to aquatic organisms.

Nitrate as N (NO3--N):
Nitrate levels in water are important for human health (drinking water quality) and indicate potential contamination from agricultural runoff or wastewater.

Chloride (Cl-):
Chloride levels are monitored for their impact on taste, corrosion of pipes, and as an indicator of potential contamination sources (sewage or industrial discharges).

Total Hardness (TH):
Total hardness measures the concentration of calcium and magnesium salts in water. It affects the taste of water, scale formation in pipes, and the effectiveness of detergents.

Boron (B):
Boron levels are important for agricultural water quality, as high concentrations can be toxic to plants and aquatic organisms.

Sodium Adsorption Ratio (SAR):
SAR is used to assess the suitability of water for irrigation purposes. It indicates the potential for soil degradation due to excessive sodium.

Dissolved Oxygen (DO):
DO is vital for aquatic life as it supports respiration. Low DO levels can lead to fish kills and indicate poor water quality.

Biochemical Oxygen Demand (BOD):
BOD measures the amount of oxygen consumed by microorganisms during the decomposition of organic matter. High BOD indicates pollution and can deplete DO levels.

Total Coliform (TC) and Faecal Coliform (FC):
Coliform bacteria are indicators of faecal contamination and the potential presence of pathogens in water. They are used to assess the safety of drinking water.

Water Quality Criteria:

In India, the Central Pollution Control Board (CPCB), has developed a concept of "designated best use". Based on this classification, the natural water has been categorized under five classes. Further, they also identified water quality requirements in terms of few chemical characteristics, known as primary water quality criteria. The "designated best uses" along with respective water quality criteria is given in Table below.

Table 6: Designated best uses of water by CPCB

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism- MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20° C 2mg/l or less
Outdoor bathing (Organised)	B	Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20° C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less Biochemical Oxygen Demand 5 days 20° C 2mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm- Max.2250 Sodium Absorption Ratio Max. 26 Boron Max. 2mg/l

The eight parameters: pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD) and Total Coliform (TC), Free Ammonia (NH3-N), Electrical Conductivity (EC), Boron (B), Sodium Adsorption Ratio (SAR) are required for classification based on Class B, D & E of Designated best uses of water by Central Pollution Control Board (CPCB).

Table 7: Class used for analysis

SN	Parameter	Applicable Class	Permissible Range/Value as per Class
1	pH	B	Between 6.5 and 8.5
2	DO	B	5 mg/l or more
3	BOD	B	BOD 5 days 20°C 3mg/l or less
4	TC	B	500 MPN/100ml or less
5	Free Ammonia as N	D	1.2 mg/l or less
6	EC	E	Max 2250 micro mhos/cm
7	SAR	E	Max 26
8	B	E	Max 2mg/l

In addition to above parameters, hotspots identification in Indian River w.r.t. Fluoride(F^-), Nitrate as N (NO3--N), Chloride (Cl-), Total Hardness (TH) parameters are done based on BIS (Bureau of Indian Standards) IS 10500: 2012 for drinking water as a benchmark in absence of any standard for these parameters for drinking waters.

Table 8: BIS 10500:2012 Standards for Drinking Water

Sl. No.	Parameters	Drinking Water IS 10500 : 2012	
		Acceptable Limit (Requirement)	**Permissible Limit** (in the absence of alternate source)
1	Total Dissolved Solids, mg/L, Max	500	**2000**
2	Turbidity, NTU, Max	1	**5**
3	Calcium as Ca, mg/L, Max	75	**200**
4	Magnesium as Mg, mg/L, Max	30	**100**
5	Chloride as Cl^-, mg/L, Max	250	**1000**
6	Sulphate as SO_4, mg/L, Max	200	**400**
7	Fluoride as F, mg/L, Max	1	**1.5**
8	Total Hardness as mg CaCO3/L, Max	200	**600**
9	Total Alkalinity as mg CaCO3/L, Max	200	**600**

Note: For 9 WQ parameters viz. Fluoride, Chloride, Sulphate, Total Hardness, Calcium, Magnesium, Turbidity, Total alkalinity & Total Dissolved Solids, the permissible limits have been adopted from BIS drinking Water Quality Standard, BIS 10500:2012 in absence of specific river water quality standards.

Sampling Procedure and transportation:

Grab sampling procedure has been adopted as per the CWC norms and river water samples were collected on the 3-a-m basis (i.e. 1st, 11th and 21st of every month) at the point of maximum flow (C/L) and depth below 30 cm. from the surface in pre-cleaned, sterilized polyethylene bottles and filled without air bubbles and sent to the Level -II lab at HGDWQ Laboratory, CWC, Haridwar and MGDWQ Laboratory, CWC, Lucknow for 3-a-m water quality analysis. Apart from this, water samples

were also collected for the analysis of in situ parameters like DO, pH, EC and Temperature etc. on 1st 11th and 21st of every month at the site itself.

All water quality samples should be stored at a temperature below 40C and in the dark as soon after sampling as possible. Samples for BOD, Coliforms, pesticides and other organics that are likely to volatilize MUST be kept at 40C and dark. In the field, this usually means placing them in an insulated cool box together with ice or cold packs. Once in the laboratory, samples should be transferred as soon as possible to a refrigerator. Cooling serves the purpose of reducing the reaction rate of all bio-chemical reactions taking place in the sample and thus slowing down undesired changes in the quality of the sample.

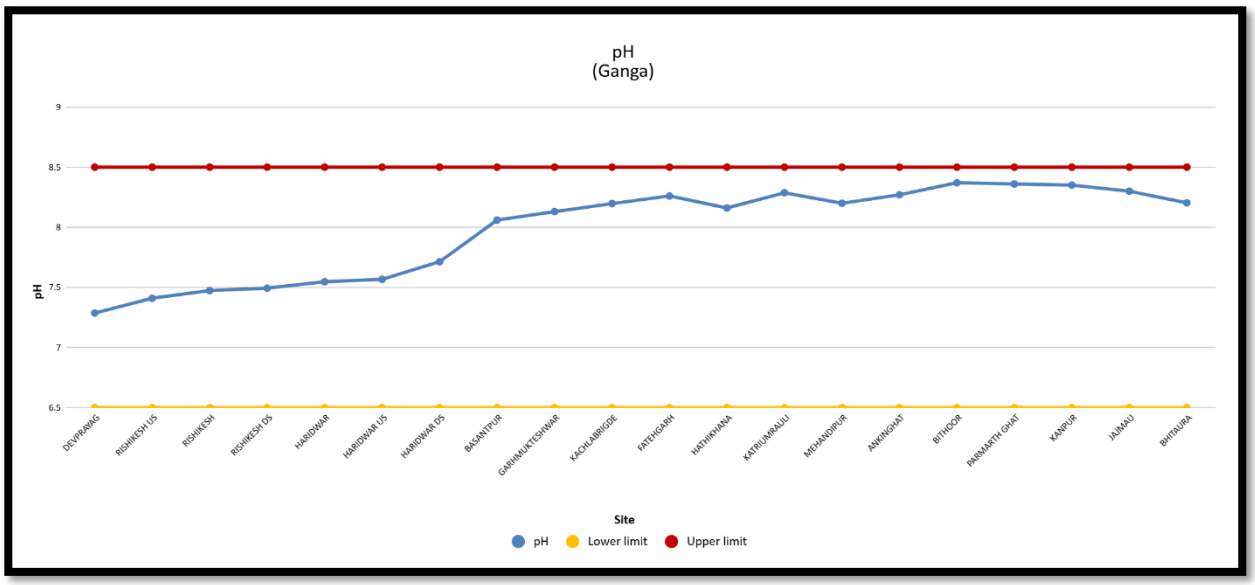
Table 9: Methodology used for analysis

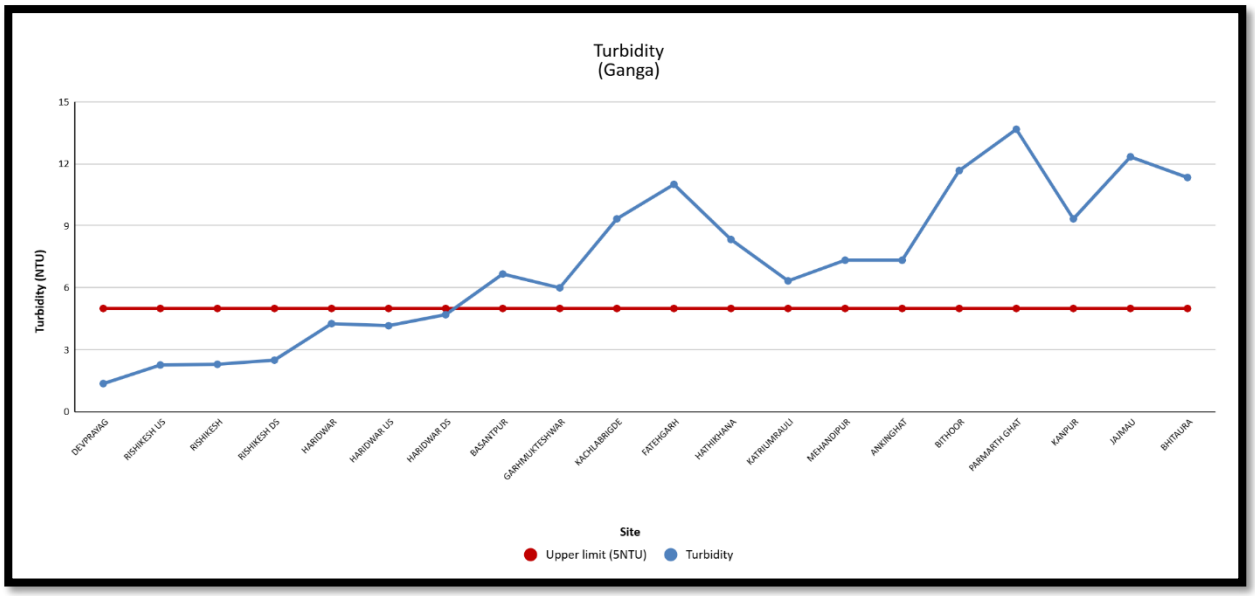
S. No.	Parameter	Method Of Analysis	Type
	Colour	Visual observation (in-situ) method	Physical parameters
	Odour	Qualitative human receptor method	
1	Temperature	APHA 2550- B (Laboratory and field Methods)	
2	pH	APHA 4500H+ B (Electrometric Method)	
3	EC	APHA 2510 B (Laboratory Method)	
4	Total Dissolved Solids	APHA 2540 C (TDS at 180^{o}C Method) Gravimetric Method	
5	Turbidity	APHA 2130 B Nephelometric Method	
6	Ammonia	APHA NH3 - D Ammonia- Selective Electrode method	Chemical parameters
7	Sodium	APHA 3500 Na-B Flame Emission Photometric Method	
8	Calcium	APHA 3500 Ca-B EDTA Titrimetric Method	
9	Magnesium	APHA 3500 Mg-B Calculation Method	
10	Potassium	APHA 3500 K-D Flame Emission Photometric Method	
11	Boron	APHA 4500 B Curcumin Method	
12	Carbonate	APHA 2320 B Titration Method	
13	Bicarbonate	APHA 2320 B Titration Method	
14	Fluoride	APHA 4500 F-C (ISE Method), APHA 4500-D (SPADNS Method)	
15	Chloride	APHA 4500 Cl- B (Argentometric Method)	
16	Sulphate	APHA 4500- SO42- E AS TOTAL PHOSPHATE (Turbidimetric Method)	
17	Nitrate	APHA 4500 NO3- D (Nitrate Electrode Method)	
18	Nitrite	APHA 4500 NO2- B (Colorimetric Method)	
19	Silicate	APHA 4500 -SiO2 C (Molybdosilicate Method), APHA 4500 – SiO2- D. (Heteropoly Blue Method)	
20	Phosphate	APHA 4500- P E (Ascorbic Acid Method)	
21	DO	APHA 4500, O-C (Azide Modification Method)	
22	BOD	APHA 5210 B 5-day BOD Test Method,	
23	COD	APHA 5220 D Closed Reflux Colorimetric Method, APHA 5220 B Open Reflux Method - When COD observed less than 4mg/l.	
24	Total Coliform	MPN method	Biological parameters
25	Faecal Coliform	MPN method	

5-RESULTS AND DISCUSSION

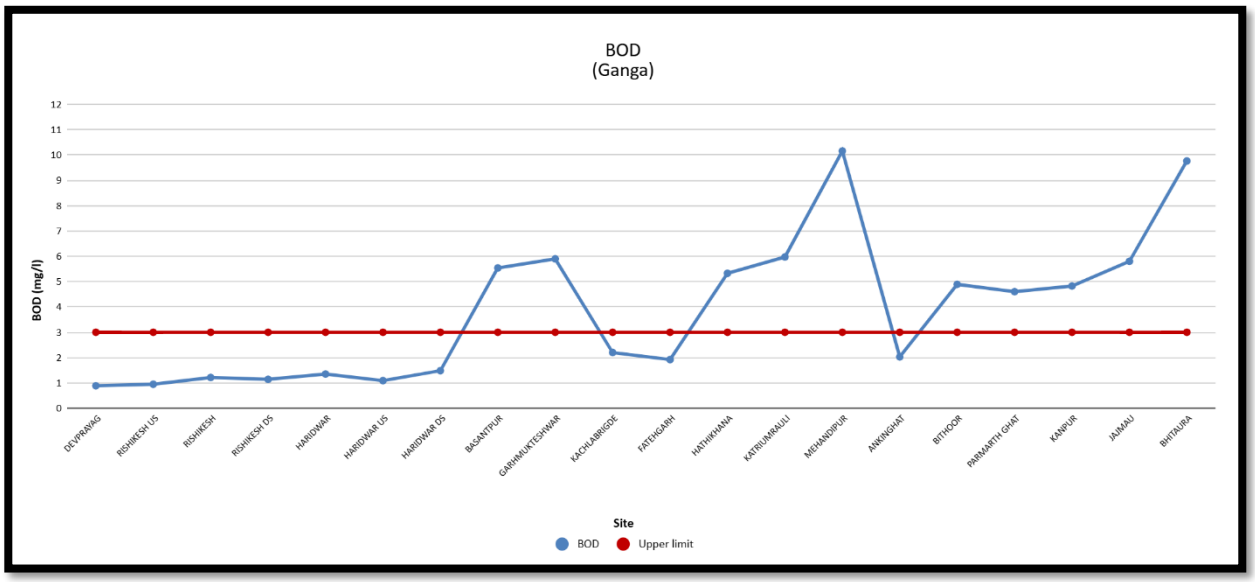
The graphs below represent water quality parameters (Turbidity, DO, BOD) which have exceeded the permissible limits in applicable river basins during the month. In addition, graphs for pH have also been included. Though samples are collected thrice a month, **average value has been used for data analysis and charting for simplicity**.

A. Graphs for Ganga River:



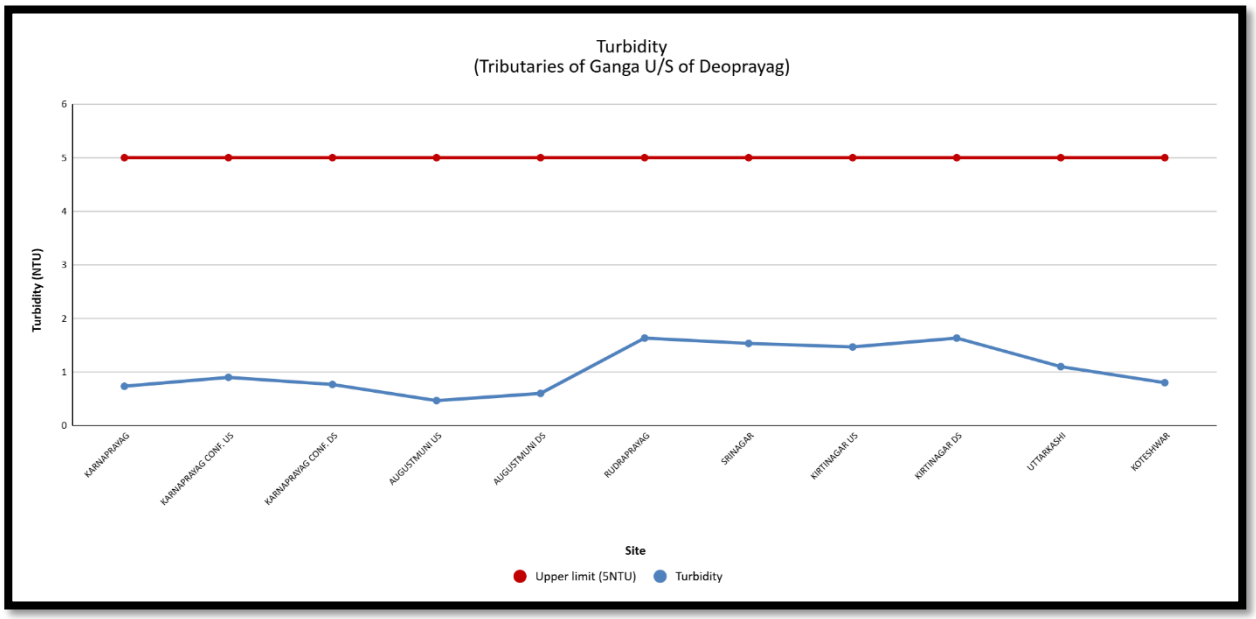



DO
(Ganga)
DO (mg/l)
10
9
8
7
6
5
4
DEVPRAYAG
RISHIKESH US
RISHIKESH
RISHIKESH DS
HARIDWAR
HARIDWAR US
HARIDWAR DS
BASANTPUR
GARHMUKTESHWAR
KACHLABRIGDE
FATEHGARH
HATHIKHANA
KATRIUMRAULI
MEHANDIPUR
ANKINGHAT
BITHOOR
PARMARTH GHAT
KANPUR
JAJMAU
BHITAURA
Site
DO
Lower limit

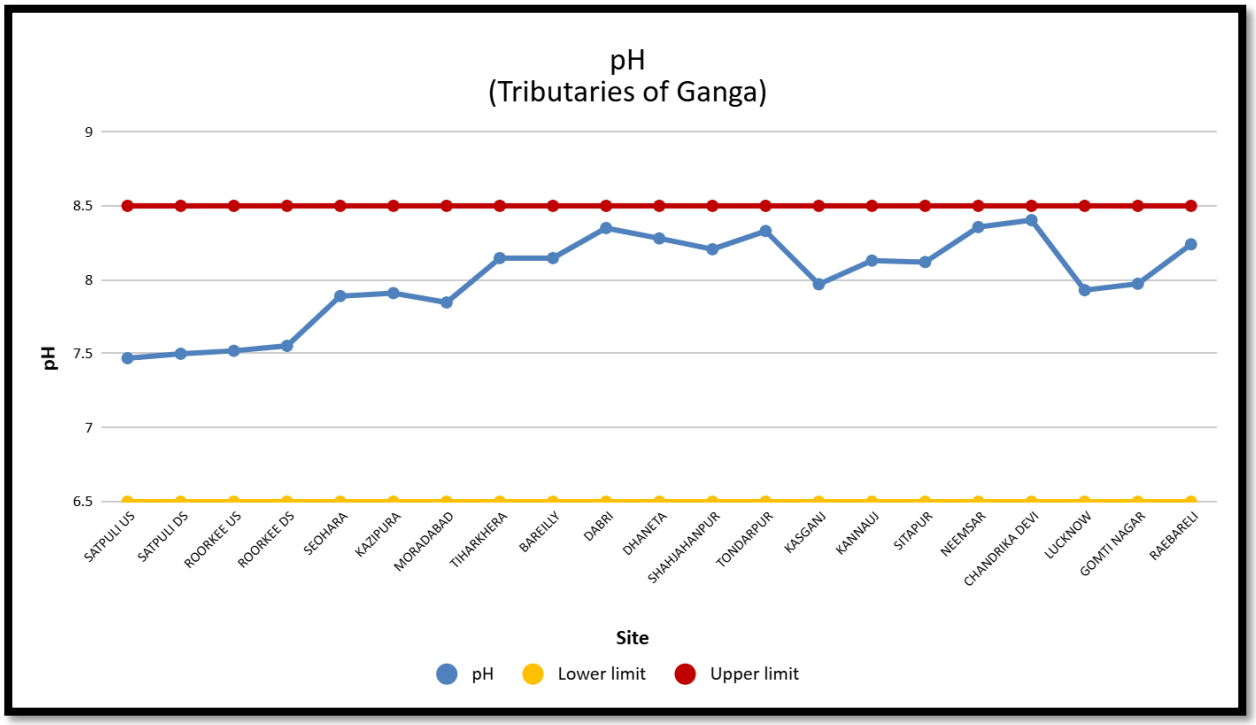

BOD
(Ganga)
BOD (mg/l)
12
11
10
9
8
7
6
5
4
3
2
1
0
DEVPRAYAG
RISHIKESH US
RISHIKESH
RISHIKESH DS
HARIDWAR
HARIDWAR US
HARIDWAR DS
BASANTPUR
GARHMUKTESHWAR
KACHLABRIGDE
FATEHGARH
HATHIKHANA
KATRIUMRAULI
MEHANDIPUR
ANKINGHAT
BITHOOR
PARMARTH GHAT
KANPUR
JAJMAU
BHITAURA
Site
BOD
Upper limit

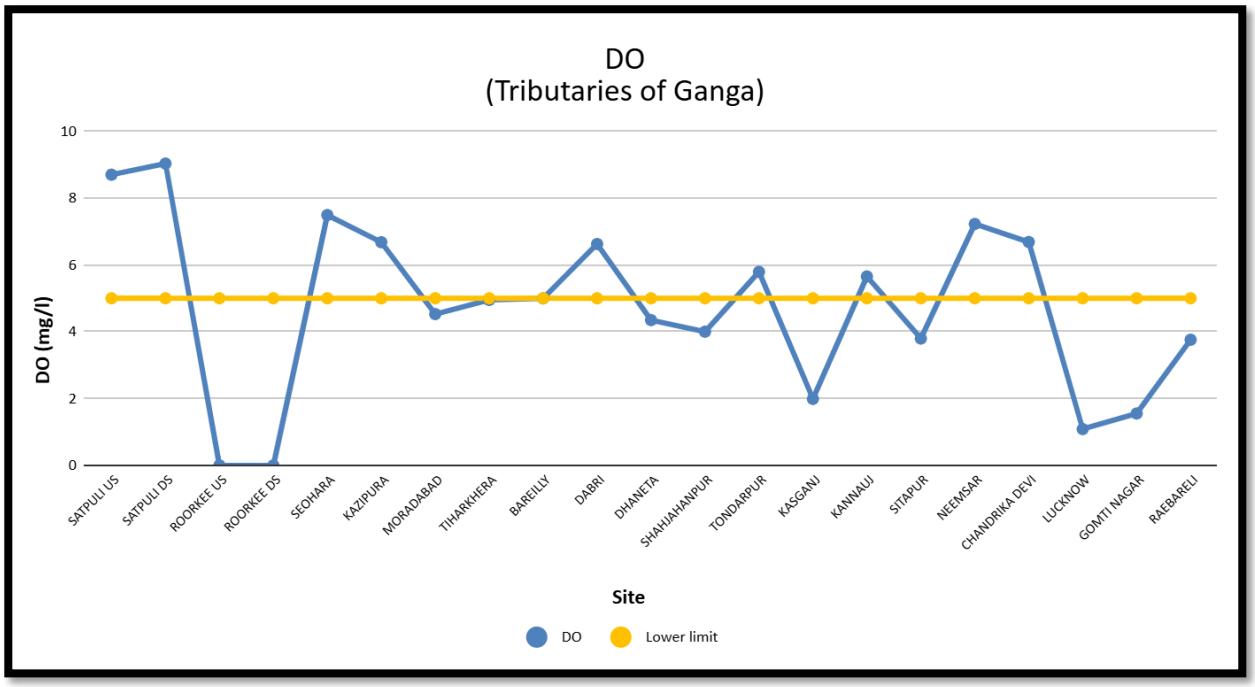
B. Graphs for Tributaries of Ganga:

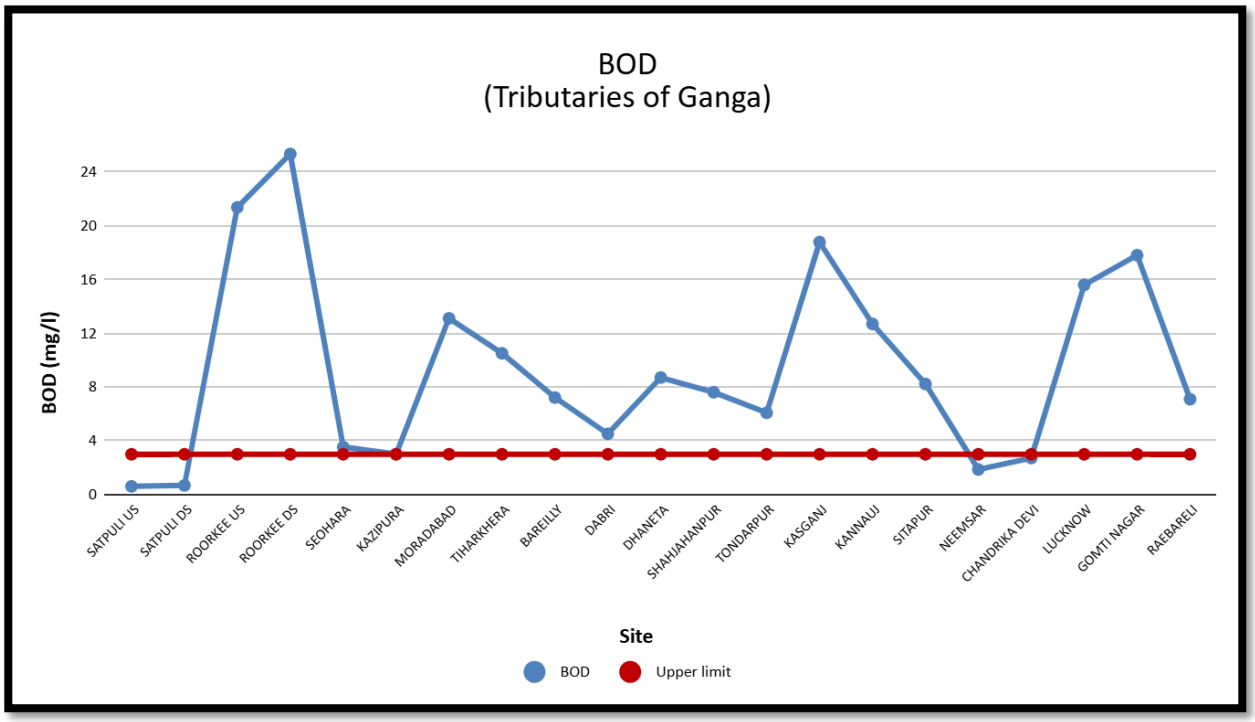
B1- Tributaries of Ganga- U/S of Devprayag

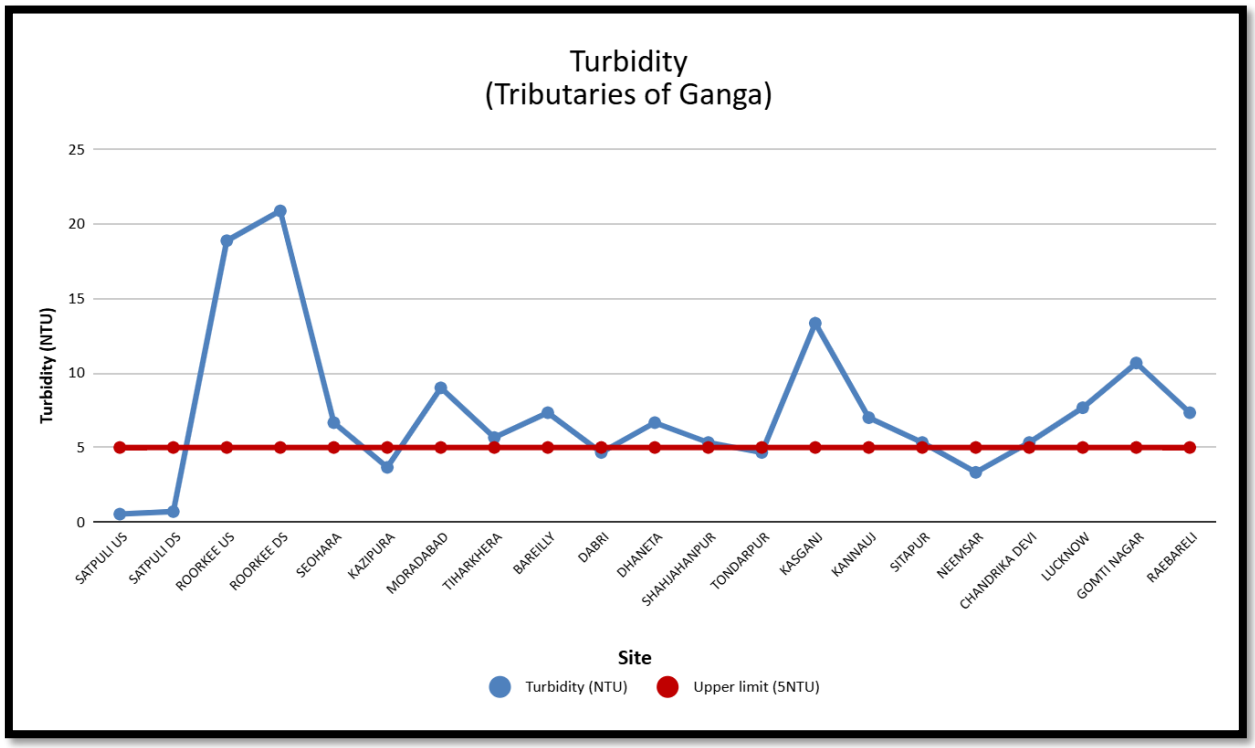


B2- Tributaries of Ganga- D/S of Devprayag

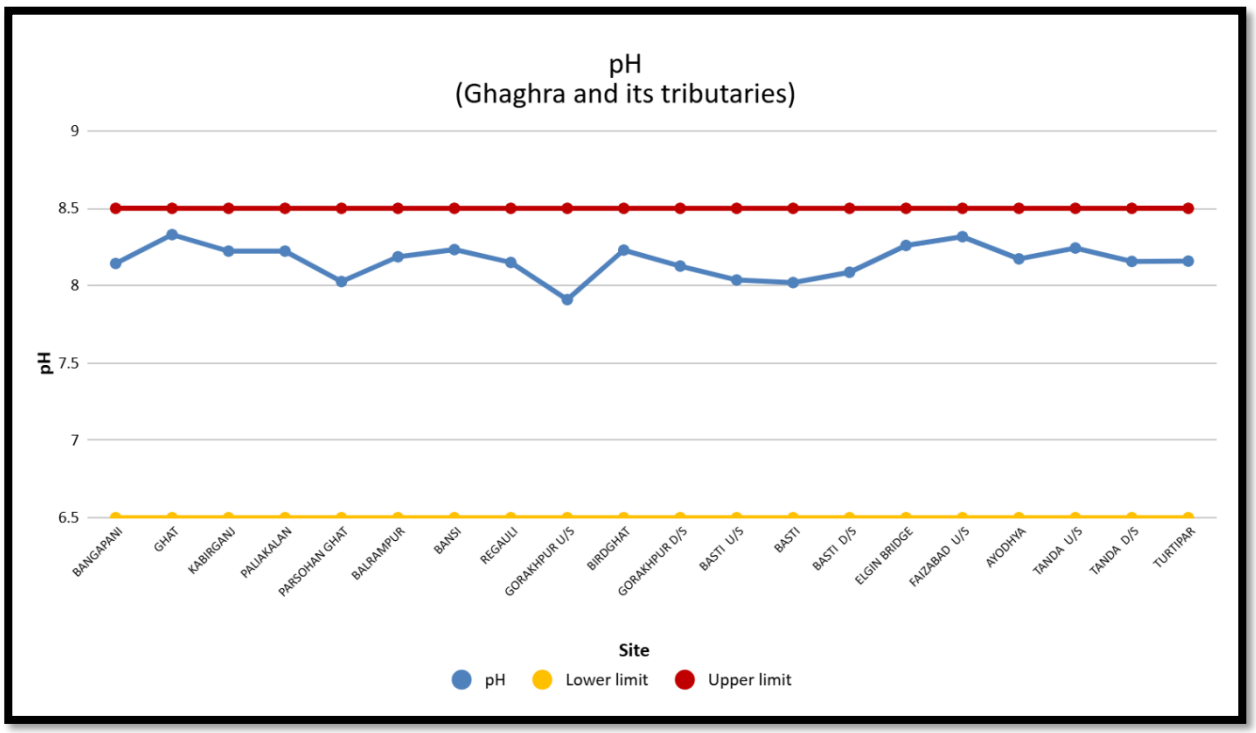


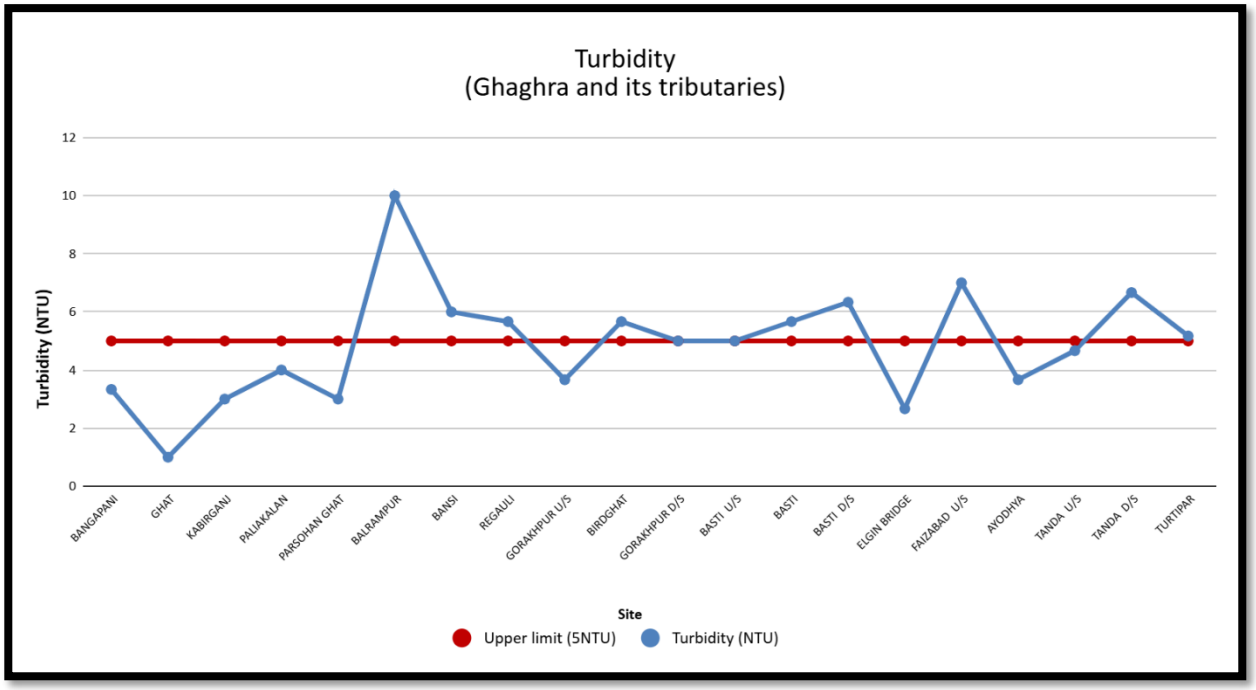

DO
(Tributaries of Ganga)
DO (mg/l)
10
8
6
4
2
0
SATPULI US
SATPULI DS
ROORKEE US
ROORKEE DS
SEOHARA
KAZIPURA
MORADABAD
TIHARKHERA
BAREILLY
DABRI
DHANETA
SHAHJAHANPUR
TONDARPUR
KASGANJ
KANNAUJ
SITAPUR
NEEMSAR
CHANDRIKA DEVI
LUCKNOW
GOMTI NAGAR
RAEBARELI
Site
DO
Lower limit

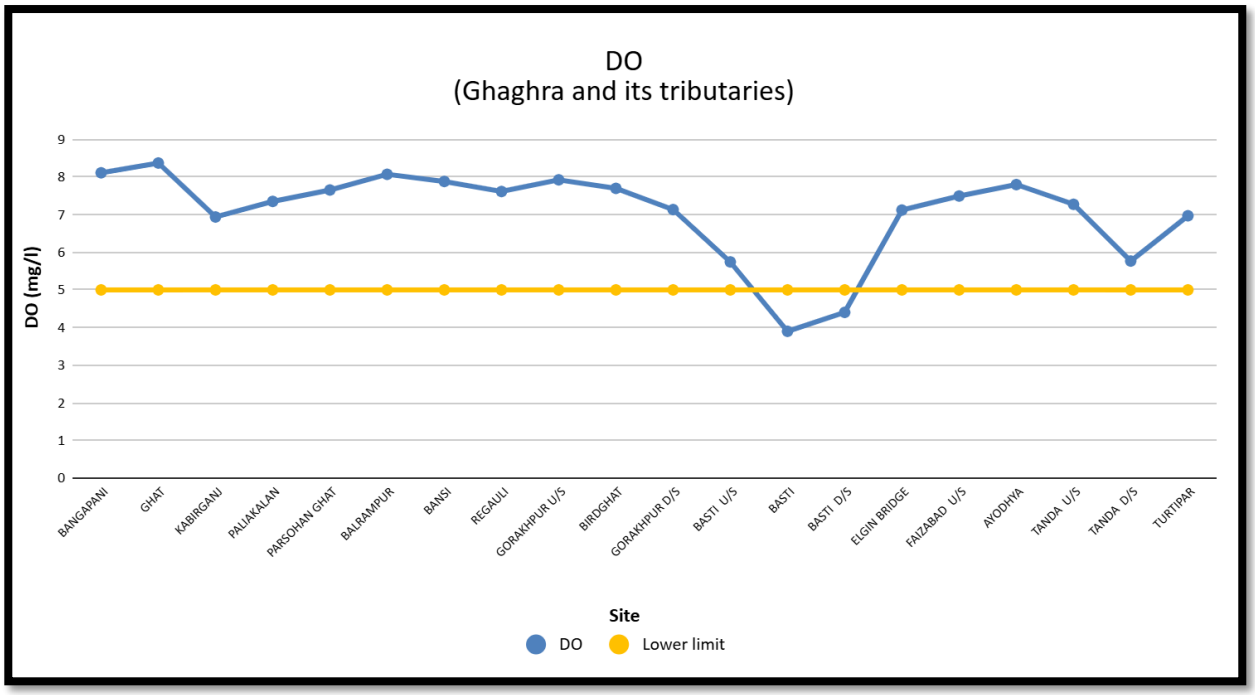

BOD
(Tributaries of Ganga)
BOD (mg/l)
24
20
16
12
8
4
0
SATPULI US
SATPULI DS
ROORKEE US
ROORKEE DS
SEOHARA
KAZIPURA
MORADABAD
TIHARKHERA
BAREILLY
DABRI
DHANETA
SHAHJAHANPUR
TONDARPUR
KASGANJ
KANNAUJ
SITAPUR
NEEMSAR
CHANDRIKA DEVI
LUCKNOW
GOMTI NAGAR
RAEBARELI
Site
BOD
Upper limit


Turbidity
(Tributaries of Ganga)
Turbidity (NTU)
25
20
15
10
5
0
SATPULI US
SATPULI DS
ROORKEE US
ROORKEE DS
SEOHARA
KAZIPURA
MORADABAD
TIHARKHERA
BAREILLY
DABRI
DHANETA
SHAHJAHANPUR
TONDARPUR
KASGANJ
KANNAUJ
SITAPUR
NEEMSAR
CHANDRIKA DEVI
LUCKNOW
GOMTI NAGAR
RAEBARELI
Site
Turbidity (NTU)
Upper limit (5NTU)

C. Graphs for Ghaghra and its tributaries:






DO
(Ghaghra and its tributaries)
DO (mg/l)
9
8
7
6
5
4
3
2
1
0
BANGAPANI
GHAT
KABIRGANJ
PALIAKALAN
PARSOHAN GHAT
BALRAMPUR
BANSI
REGAULI
GORAKHPUR U/S
BIRDGHAT
GORAKHPUR D/S
BASTI U/S
BASTI
BASTI D/S
ELGIN BRIDGE
FAIZABAD U/S
AYODHYA
TANDA U/S
TANDA D/S
TURTIPAR
Site
DO
Lower limit

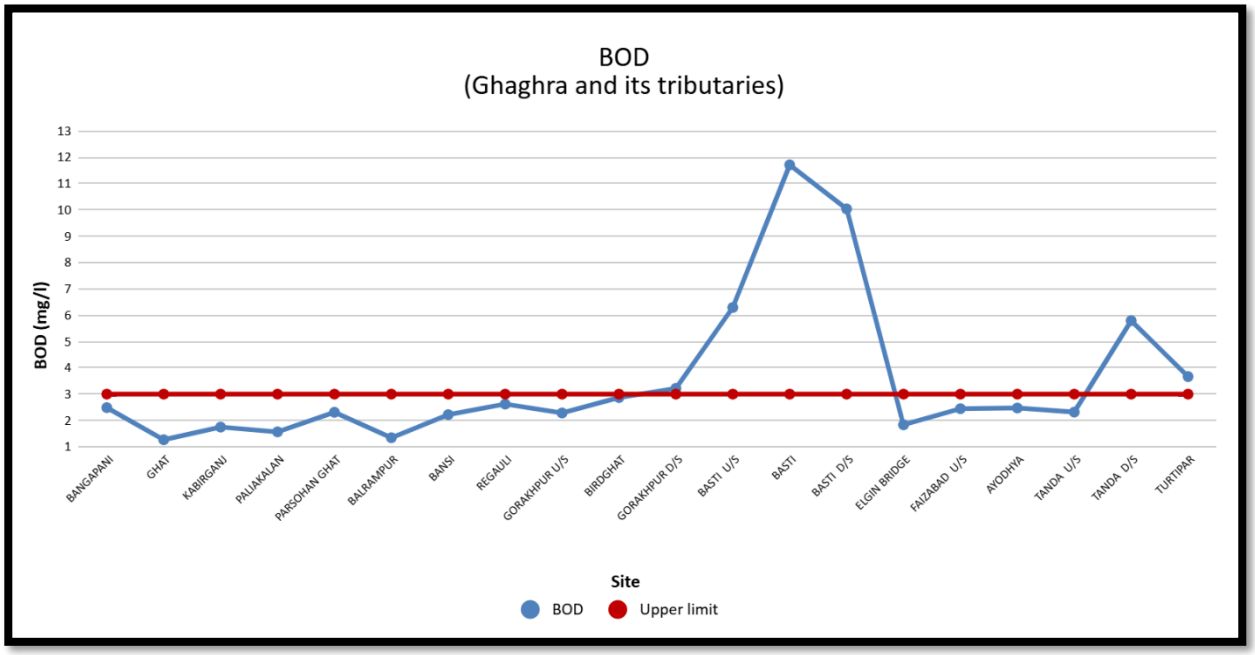

BOD
(Ghaghra and its tributaries)
BOD (mg/l)
13
12
11
10
9
8
7
6
5
4
3
2
1
BANGAPANI
GHAT
KABIRGANJ
PALIAKALAN
PARSOHAN GHAT
BALRAMPUR
BANSI
REGAULI
GORAKHPUR U/S
BIRDGHAT
GORAKHPUR D/S
BASTI U/S
BASTI
BASTI D/S
ELGIN BRIDGE
FAIZABAD U/S
AYODHYA
TANDA U/S
TANDA D/S
TURTIPAR
Site
BOD
Upper limit

Table 10: Comparison of data with last month

S. No	WQ Site	River	Division	Basin	State	pH		EC (µS/cm)		Turbidity(NTU)		F- (mg/L)		NH_3-N		DO (mg/L)		BOD (mg/L)	
						Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan
1	Bangapani	Gauriganga	MGD-1	Ghaghra	UK	8.14	8.23	392.33	402.67	3.33	2.67	0.25	0.24	0.14	0.15	8.11	8.03	2.49	2.53
2	Ghat	Saryu	MGD-1	Ghaghra	UK	8.33	8.28	375.67	345.33	1.00	4.00	0.17	0.15	0.14	0.13	8.37	7.87	1.27	2.58
3	Kabirganj	Sharda	MGD-1	Ghaghra	UP	8.22	8.14	442.33	402.67	3.00	7.00	0.16	0.17	0.17	0.18	6.94	6.99	1.75	2.04
4	Paliakalan	Sharda	MGD-1	Ghaghra	UP	8.22	8.35	433.33	438.33	4.00	5.00	0.19	0.20	0.21	0.24	7.35	7.07	1.57	1.82
5	Parsohan Ghat	Burhi Rapti	MGD-1	Ghaghra	UP	8.03	8.12	577.00	593.33	3.00	3.33	0.18	0.20	0.14	0.14	7.65	7.66	2.31	2.86
6	Balrampur	Rapti	MGD-1	Ghaghra	UP	8.19	8.10	402.33	432.33	10.00	8.33	0.09	0.09	0.16	0.16	8.07	7.84	1.34	2.58
7	Bansi	Rapti	MGD-1	Ghaghra	UP	8.23	8.24	431.33	429.33	6.00	7.67	0.08	0.09	0.17	0.17	7.88	7.82	2.22	2.30
8	Regauli	Rapti	MGD-1	Ghaghra	UP	8.15	8.05	521.00	491.67	5.67	6.33	0.09	0.10	0.18	0.19	7.61	7.80	2.62	2.19
9	Gorakhpur U/S	Rapti	MGD-1	Ghaghra	UP	7.91	8.19	448.67	485.00	3.67	4.67	0.09	0.11	0.19	0.20	7.92	7.71	2.28	2.95
10	Birdghat	Rapti	MGD-1	Ghaghra	UP	8.23	8.17	463.00	502.00	5.67	4.33	0.13	0.13	0.23	0.22	7.70	7.79	2.87	3.11
11	Gorakhpur D/S	Rapti	MGD-1	Ghaghra	UP	8.13	8.06	453.00	479.33	5.00	5.00	0.13	0.13	0.24	0.24	7.13	7.64	3.22	3.28
12	Basti U/S	Kwano	MGD-1	Ghaghra	UP	8.04	8.16	525.33	557.00	5.00	5.67	0.30	0.30	0.18	0.18	5.74	6.12	6.29	6.28
13	Basti	Kwano	MGD-1	Ghaghra	UP	8.02	8.09	543.67	569.00	5.67	6.00	0.30	0.30	0.20	0.20	3.90	6.91	11.71	5.51
14	Basti D/S	Kwano	MGD-1	Ghaghra	UP	8.09	8.20	529.67	548.67	6.33	5.00	0.34	0.34	0.23	0.24	4.40	5.93	10.04	6.11
15	Elgin Bridge	Ghaghra	MGD-1	Ghaghra	UP	8.26	8.23	370.33	372.67	2.67	4.33	0.13	0.12	0.18	0.17	7.12	6.66	1.83	2.36
16	Faizabad U/S	Ghaghra	MGD-1	Ghaghra	UP	8.32	8.17	375.33	390.33	7.00	10.00	0.15	0.14	0.22	0.20	7.49	7.41	2.45	3.28
17	Ayodhya	Ghaghra	MGD-1	Ghaghra	UP	8.17	8.21	368.67	383.67	3.67	6.33	0.16	0.15	0.24	0.23	7.80	7.20	2.47	3.20
18	Tanda U/S	Ghaghra	MGD-1	Ghaghra	UP	8.24	8.22	370.67	388.33	4.67	7.33	0.15	0.13	0.22	0.20	7.27	7.63	2.32	2.55
19	Tanda D/S	Ghaghra	MGD-1	Ghaghra	UP	8.16	8.21	397.00	396.67	6.67	10.67	0.19	0.16	0.30	0.27	5.77	7.54	5.79	2.96
20	Turtipar	Ghaghra	MGD-1	Ghaghra	UP	8.16	8.17	447.87	459.49	5.17	6.49	0.17	0.17	0.21	0.20	6.97	7.32	3.67	3.25
21	Karnaprayag	Pinder	HGD	Ganga	UK	7.66	7.51	213.33	212.33	0.73	3.30	0.16	0.12	0.00	0.00	8.83	9.34	0.82	0.77
22	Karnaprayag Confluence U/S	Alaknanda	HGD	Ganga	UK	7.68	7.52	204.00	207.67	0.90	3.37	0.16	0.13	0.00	0.00	8.90	9.14	0.69	0.70
23	Karnaprayag Confluence D/S	Alaknanda	HGD	Ganga	UK	7.64	7.59	207.33	207.67	0.77	3.33	0.17	0.14	0.00	0.00	9.03	9.28	1.02	0.97
24	Augustmuni U/S	Mandakini	HGD	Ganga	UK	7.46	7.55	148.00	158.53	0.47	2.63	0.17	0.08	0.00	0.00	9.57	8.88	0.57	0.70
25	Augustmuni D/S	Mandakini	HGD	Ganga	UK	7.43	7.54	142.33	160.43	0.60	2.03	0.09	0.08	0.00	0.00	9.23	9.41	0.63	0.84

S. No	WQ Site	River	Division	Basin	State	pH		EC (µS/cm)		Turbidity(NTU)		F- (mg/L)		NH_3-N		DO (mg/L)		BOD (mg/L)	
						Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan
26	Rudraprayag (A)	Alaknanda	HGD	Ganga	UK	7.58	7.57	215.67	182.20	3.33	5.47	0.23	0.18	0.00	0.00	9.10	9.48	1.15	1.17
27	Srinagar	Alaknanda	HGD	Ganga	UK	7.61	7.73	204.67	201.60	1.00	4.47	0.21	0.21	0.00	0.00	9.10	9.28	1.15	1.24
28	Kirtinagar U/S	Alaknanda	HGD	Ganga	UK	7.52	7.64	206.67	204.00	3.00	4.57	0.20	0.18	0.00	0.00	9.03	9.08	1.08	1.24
29	Kirtinagar D/S	Alaknanda	HGD	Ganga	UK	7.56	7.66	210.67	204.33	4.00	4.87	0.21	0.21	0.00	0.00	8.76	9.08	1.14	1.24
30	Uttarkashi	Bhagirathi	HGD	Ganga	UK	7.67	7.53	177.67	177.73	3.00	2.50	0.32	0.33	0.00	0.00	9.63	9.82	0.70	0.77
31	Koteshwar	Bhagirathi	HGD	Ganga	UK	7.80	7.41	124.67	124.57	10.00	2.63	0.26	0.24	0.0	0.0	8.36	8.27	0.74	0.90
32	Satpuli U/S	Nayar	HGD	Ganga	UK	7.47	7.39	152.67	151.13	6.00	5.70	0.08	0.06	0.00	0.00	8.70	8.60	0.62	0.63
33	Satpuli D/S	Nayar	HGD	Ganga	UK	7.50	7.45	153.00	153.30	5.67	5.17	0.08	0.07	0.00	0.00	9.03	8.80	0.69	0.83
34	Devprayag	Ganga	HGD	Ganga	UK	7.29	7.47	157.00	137.40	3.67	6.83	0.27	0.24	0.00	0.00	9.03	9.35	0.89	0.97
35	Rishikesh U/S	Ganga	HGD	Ganga	UK	7.41	7.45	152.67	172.90	5.67	8.07	0.28	0.25	0.00	0.00	8.63	9.61	0.95	1.10
36	Rishikesh	Ganga	HGD	Ganga	UK	7.47	7.52	148.00	168.60	5.00	8.20	0.26	0.29	0.00	0.00	8.83	9.68	1.21	1.30
37	Rishikesh D/S	Ganga	HGD	Ganga	UK	7.49	7.53	153.67	170.73	5.00	8.73	0.27	0.30	0.00	0.00	8.63	9.82	1.14	1.37
38	Haridwar	Ganga	HGD	Ganga	UK	7.55	7.71	170.33	206.10	5.67	9.17	0.33	0.35	0.00	0.00	9.36	9.15	1.35	1.24
39	Haridwar U/S	Ganga	HGD	Ganga	UK	7.57	7.73	171.67	193.20	6.33	8.40	0.32	0.33	0.00	0.00	9.50	9.48	1.09	0.97
40	Haridwar D/S	Ganga	HGD	Ganga	UK	7.71	7.73	172.67	195.77	2.67	9.03	0.36	0.38	0.00	0.00	9.30	9.68	1.48	1.30
41	Roorkee U/S	Solani	HGD	Ganga	UK	7.52	7.51	972.33	902.33	7.00	17.17	0.42	0.45	0.13	0.12	0.00	0.00	21.33	17.00
42	Roorkee D/S	Solani	HGD	Ganga	UK	7.55	7.30	977.33	888.00	3.67	19.40	0.44	0.47	0.16	0.14	0.00	0.00	25.30	22.33
43	Basantpur	Ganga	MGD-2	Ganga	UP	8.06	8.13	265.00	326.33	4.67	7.33	0.23	0.23	0.27	0.30	5.77	7.15	5.54	3.20
44	Garhmukteshwar	Ganga	MGD-2	Ganga	UP	8.13	8.08	277.33	349.67	6.67	6.00	0.22	0.24	0.25	0.28	6.73	7.47	5.90	3.39
45	Kachhlabridge	Ganga	MGD-2	Ganga	UP	8.20	8.24	291.00	351.33	5.17	9.67	0.23	0.24	0.26	0.28	7.90	7.78	2.20	3.16
46	Fatehgarh	Ganga	MGD-2	Ganga	UP	8.26	8.30	281.33	334.00	0.73	13.00	0.21	0.24	0.26	0.29	6.87	6.58	1.92	4.41
47	Hathikhana	Ganga	MGD-2	Ganga	UP	8.16	8.18	312.33	385.67	0.90	12.33	0.24	0.27	0.27	0.33	6.50	6.31	5.33	5.05
48	Katriumrauli	Ganga	MGD-2	Ganga	UP	8.29	8.20	381.00	425.67	0.77	15.00	0.19	0.21	0.30	0.32	6.00	6.80	5.97	6.29
49	Mehandipur	Ganga	MGD-2	Ganga	UP	8.20	8.26	441.67	488.67	0.47	10.67	0.21	0.22	0.31	0.31	5.86	4.12	10.16	7.61
50	Ankinghat	Ganga	MGD-2	Ganga	UP	8.27	8.20	418.33	454.33	0.60	11.33	0.22	0.23	0.30	0.30	7.29	6.85	2.03	3.11
51	Bithoor	Ganga	MGD-2	Ganga	UP	8.37	8.22	403.67	458.00	1.63	9.33	0.23	0.24	0.32	0.32	7.42	7.67	4.89	3.48
52	Parmarthghat	Ganga	MGD-2	Ganga	UP	8.36	8.27	387.33	434.67	1.53	10.00	0.23	0.24	0.33	0.33	7.50	7.35	4.60	4.88
53	Kanpur	Ganga	MGD-2	Ganga	UP	8.35	8.27	419.33	461.33	1.47	9.33	0.26	0.26	0.37	0.38	7.20	7.47	4.83	4.43

S. No	WQ Site	River	Division	Basin	State	pH		EC (µS/cm)		Turbidity(NTU)		F- (mg/L)		NH_3-N		DO (mg/L)		BOD (mg/L)	
						Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan	Feb	Jan
54	Jajmau	Ganga	MGD-2	Ganga	UP	8.30	8.18	420.67	484.33	1.63	13.33	0.27	0.26	0.41	0.43	6.36	6.22	5.80	3.95
55	Bhitaura	Ganga	MGD-2	Ganga	UP	8.20	8.29	371.33	433.00	1.10	12.67	0.20	0.21	0.35	0.35	5.08	5.89	9.77	5.92
56	Seohara	Ramganga	MGD-2	Ganga	UP	7.89	8.19	319.00	478.33	0.80	9.33	0.11	0.16	0.25	0.36	7.49	7.20	3.54	5.97
57	Kazipura	Ramganga	MGD-2	Ganga	UP	7.91	8.06	331.33	493.33	0.53	7.67	0.12	0.16	0.27	0.38	6.68	7.56	3.02	5.77
58	Moradabad (R)	Ramganga	MGD-2	Ganga	UP	7.85	8.09	469.00	542.33	0.70	10.33	0.12	0.16	0.29	0.41	4.53	5.87	13.09	6.32
59	Tiharkheda	Ramganga	MGD-2	Ganga	UP	8.15	8.11	683.00	681.67	1.37	11.33	0.21	0.20	0.44	0.42	4.95	6.02	10.50	5.76
60	Bareilly	Ramganga	MGD-2	Ganga	UP	8.15	7.97	677.00	699.00	2.27	12.00	0.23	0.24	0.42	0.43	5.00	6.92	7.21	6.21
61	Dabri	Ramganga	MGD-2	Ganga	UP	8.35	8.18	684.33	645.67	2.30	12.00	0.24	0.23	0.36	0.33	6.62	6.65	4.52	7.00
62	Dhaneta	Baigul/Kichha	MGD-2	Ganga	UP	8.28	8.18	834.33	805.33	2.50	12.67	0.18	0.18	0.35	0.35	4.35	1.89	8.70	17.87
63	Shahjahanpur	Khannaut	MGD-2	Ganga	UP	8.21	8.13	462.00	504.00	4.27	9.33	0.25	0.25	0.31	0.32	4.00	3.55	7.60	8.21
64	Todarpur	Sukheta	MGD-2	Ganga	UP	8.33	8.21	425.67	523.00	4.17	8.67	0.16	0.19	0.28	0.31	5.79	7.23	6.08	5.84
65	Kasganj	Kali	MGD-2	Ganga	UP	7.97	7.92	815.67	667.67	4.70	19.67	0.35	0.31	0.56	0.52	1.99	2.71	18.75	17.72
66	Kannauj	Kali	MGD-2	Ganga	UP	8.13	8.13	567.67	576.33	18.87	14.33	0.34	0.34	0.44	0.42	5.65	4.86	12.68	10.37
67	Sitapur	Sarayan	MGD-2	Ganga	UP	8.12	8.19	533.33	525.67	20.87	8.67	0.35	0.33	0.25	0.24	3.80	4.70	8.22	6.70
68	Neemsar	Gomti	MGD-2	Ganga	UP	8.36	8.42	444.67	512.67	6.67	11.33	0.27	0.31	0.21	0.22	7.22	6.55	1.87	3.35
69	Chandrika Devi	Gomti	MGD-2	Ganga	UP	8.40	8.22	477.67	644.67	6.00	7.33	0.32	0.33	0.26	0.26	6.68	7.13	2.72	2.85
70	Lucknow	Gomti	MGD-2	Ganga	UP	7.93	8.11	639.00	621.33	9.33	11.67	0.33	0.33	0.43	0.41	1.09	2.11	15.58	17.35
71	Gomtinagar	Gomti	MGD-2	Ganga	UP	7.97	8.01	732.00	683.67	11.00	18.67	0.34	0.33	0.60	0.59	1.55	2.91	17.78	14.12
72	Raebareli	Sai	MGD-2	Ganga	UP	8.24	8.23	573.67	658.00	8.33	11.67	0.34	0.35	0.44	0.47	3.76	4.26	7.09	8.23

Table 11: Basin-wise summary of data

S. No.	WQ Site	River	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
Sharda basin																
1	Bangapani	Gauriganga	8.14	392.33	249.33	3.33	10.12	36.55	0.25	0.14	8.03	0.14	8.11	2.49	193.78	0.24
2	Ghat	Saryu	8.33	375.67	248.33	1.00	9.48	13.12	0.17	0.13	8.33	0.14	8.37	1.27	168.15	0.24
3	Kabirganj	Sharda	8.22	442.33	288.67	3.00	8.38	25.07	0.16	0.19	8.87	0.17	6.94	1.75	205.77	0.19
4	Paliakalan	Sharda	8.22	433.33	299.33	4.00	9.03	23.36	0.19	0.19	8.90	0.21	7.35	1.57	197.27	0.21
Rapti Basin																
5	Parsohan Ghat	Burhi Rapti	8.03	577.00	356.67	3.00	11.87	10.17	0.18	0.16	7.53	0.14	7.65	2.31	264.02	0.24
6	Balrampur	Rapti	8.19	402.33	263.33	10.00	11.08	15.29	0.09	0.19	8.53	0.16	8.07	1.34	180.00	0.27
7	Bansi	Rapti	8.23	431.33	270.67	6.00	12.12	15.68	0.08	0.21	8.40	0.17	7.88	2.22	207.66	0.28
8	Regauli	Rapti	8.15	521.00	359.33	5.67	11.47	15.29	0.09	0.22	8.27	0.18	7.61	2.62	254.44	0.24
9	Gorakhpur U/S	Rapti	7.91	448.67	326.33	3.67	12.25	15.48	0.09	0.26	8.90	0.19	7.92	2.28	213.33	0.28
10	Birdghat	Rapti	8.23	463.00	320.00	5.67	13.66	16.08	0.13	0.26	10.07	0.23	7.70	2.87	213.33	0.31
11	Gorakhpur D/S	Rapti	8.13	453.00	311.33	5.00	14.12	16.67	0.13	0.26	9.60	0.24	7.13	3.22	201.59	0.33
Kwano Basin																
12	Basti U/S	Kwano	8.04	525.33	359.33	5.00	17.79	11.75	0.30	0.19	6.23	0.18	5.74	6.29	219.11	0.40
13	Basti	Kwano	8.02	543.67	361.33	5.67	21.40	12.40	0.30	0.21	6.60	0.20	3.90	11.71	230.74	0.47
14	Basti D/S	Kwano	8.09	529.67	381.67	6.33	22.56	12.33	0.34	0.25	6.77	0.23	4.40	10.04	215.61	0.51
Ghaghra Basin																
15	Elgin Bridge	Ghaghra	8.26	370.33	252.67	2.67	10.12	15.17	0.13	0.24	9.53	0.18	7.12	1.83	169.50	0.26
16	Faizabad U/S	Ghaghra	8.32	375.33	240.67	7.00	9.73	17.78	0.15	0.26	10.30	0.22	7.49	2.45	170.83	0.25
17	Ayodhya	Ghaghra	8.17	368.67	235.00	3.67	10.19	20.87	0.16	0.28	10.40	0.24	7.80	2.47	165.06	0.26
18	Tanda U/S	Ghaghra	8.24	370.67	278.00	4.67	11.35	21.98	0.15	0.25	10.67	0.22	7.27	2.32	167.74	0.29
19	Tanda D/S	Ghaghra	8.16	397.00	277.33	6.67	11.93	22.83	0.19	0.33	11.10	0.30	5.77	5.79	177.60	0.29
20	Turtipar	Ghaghra	8.16	447.87	303.79	5.17	12.96	16.92	0.17	0.24	9.01	0.21	6.97	3.67	201.85	0.32
Alaknanda Basin																
21	Karnaprayag	Pinder	7.66	213.33	121.00	0.73	3.73	12.10	0.16	0.00	6.34	0.00	8.83	0.82	98.71	0.09
22	Karnaprayag Confluence U/S	Alaknanda	7.68	204.00	114.67	0.90	3.53	10.77	0.16	0.00	6.39	0.00	8.90	0.69	94.20	0.10

S. No.	WQ Site	River	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
23	Karnaprayag Confluence D/S	Alaknanda	7.64	207.33	116.00	0.77	3.85	16.58	0.17	0.00	6.61	0.00	9.03	1.02	95.50	0.11
24	Augustmuni U/S	Mandakini	7.46	148.00	83.67	0.47	4.37	15.08	0.17	0.00	5.59	0.00	9.57	0.57	59.57	0.16
25	Augustmuni D/S	Mandakini	7.43	142.33	81.67	0.60	5.00	8.20	0.09	0.00	4.57	0.00	9.23	0.63	55.83	0.20
26	Rudraprayag (A)	Alaknanda	7.58	215.67	122.00	1.63	3.97	24.37	0.23	0.00	6.08	0.00	9.10	1.15	100.30	0.12
27	Srinagar	Alaknanda	7.61	204.67	115.67	1.53	4.20	21.40	0.21	0.00	6.62	0.00	9.10	1.15	92.13	0.13
28	Kirtinagar U/S	Alaknanda	7.52	206.67	116.67	1.47	4.23	21.03	0.20	0.00	6.71	0.00	9.03	1.08	95.09	0.12
29	Kirtinagar D/S	Alaknanda	7.56	210.67	118.67	1.63	4.27	21.50	0.21	0.00	6.82	0.00	8.76	1.14	94.18	0.12
Bhagirathi Basin																
30	Uttarkashi	Bhagirathi	7.67	177.67	101.67	1.10	5.43	29.67	0.32	0.00	7.12	0.00	9.63	0.70	74.62	0.17
31	Koteshwar	Bhagirathi	7.80	124.67	72.67	0.80	3.77	18.73	0.26	0.00	6.64	0.0	8.36	0.74	51.85	0.14
Ganga Basin																
32	Satpuli US	Nayar	7.47	152.67	89.00	0.53	7.07	10.10	0.08	0.00	5.22	0.00	8.70	0.62	60.61	0.28
33	Satpuli DS	Nayar	7.50	153.00	91.67	0.70	7.20	10.00	0.08	0.00	5.23	0.00	9.03	0.69	60.95	0.28
34	Devprayag	Ganga	7.29	157.00	91.33	1.37	4.00	20.30	0.27	0.00	7.00	0.00	9.03	0.89	66.80	0.13
35	Rishikesh US	Ganga	7.41	152.67	86.67	2.27	4.07	21.67	0.28	0.00	7.06	0.00	8.63	0.95	65.93	0.14
36	Rishikesh	Ganga	7.47	148.00	83.00	2.30	4.23	20.17	0.26	0.00	7.10	0.00	8.83	1.21	62.62	0.15
37	Rishikesh DS	Ganga	7.49	153.67	90.00	2.50	4.43	20.63	0.27	0.00	7.15	0.00	8.63	1.14	64.34	0.16
38	Haridwar	Ganga	7.55	170.33	97.00	4.27	5.13	24.30	0.33	0.00	7.42	0.00	9.36	1.35	67.21	0.18
39	Haridwar US	Ganga	7.57	171.67	98.00	4.17	4.57	24.50	0.32	0.00	7.93	0.00	9.50	1.09	66.93	0.16
40	Haridwar DS	Ganga	7.71	172.67	101.00	4.70	5.03	25.23	0.36	0.00	8.09	0.00	9.30	1.48	69.19	0.17
54	Roorkee US	Solani	7.52	972.33	548.67	18.87	71.52	17.39	0.42	0.00	8.76	0.13	0.00	21.33	281.62	2.14
55	Roorkee DS	Solani	7.55	977.33	551.33	20.87	71.87	18.22	0.44	0.00	8.73	0.16	0.00	25.30	282.88	2.17
41	Basantpur	Ganga	8.06	265.00	192.33	6.67	11.99	19.34	0.23	0.33	13.07	0.27	5.77	5.54	107.60	0.38
42	Garhmukteshwar	Ganga	8.13	277.33	201.67	6.00	11.67	25.20	0.22	0.33	9.73	0.25	6.73	5.90	117.99	0.34
43	Kachhlabridge	Ganga	8.20	291.00	213.67	9.33	12.57	24.93	0.23	0.28	10.20	0.26	7.90	2.20	123.39	0.37
44	Fatehgarh	Ganga	8.26	281.33	209.67	11.00	12.83	25.72	0.21	0.24	8.73	0.26	6.87	1.92	115.57	0.37
45	Hathikhana	Ganga	8.16	312.33	226.67	8.33	16.70	27.16	0.24	0.28	11.07	0.27	6.50	5.33	119.20	0.46
46	Katriumrauli	Ganga	8.29	381.00	263.67	6.33	13.79	28.15	0.19	0.35	8.87	0.30	6.00	5.97	176.50	0.33
47	Mehandipur	Ganga	8.20	441.67	326.00	7.33	24.69	26.77	0.21	0.38	9.93	0.31	5.86	10.16	180.82	0.61

S. No.	WQ Site	River	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
48	Ankinghat	Ganga	8.27	418.33	303.67	7.33	17.60	27.23	0.22	0.33	8.77	0.30	7.29	2.03	184.32	0.42
49	Bithoor	Ganga	8.37	403.67	300.00	11.67	18.05	27.63	0.23	0.28	10.03	0.32	7.42	4.89	167.74	0.47
50	Parmarthghat	Ganga	8.36	387.33	276.67	13.67	18.18	27.04	0.23	0.27	10.20	0.33	7.50	4.60	150.48	0.48
51	Kanpur	Ganga	8.35	419.33	305.33	9.33	19.08	28.48	0.26	0.29	10.10	0.37	7.20	4.83	167.34	0.49
52	Jajmau	Ganga	8.30	420.67	313.00	12.33	24.50	31.63	0.27	0.32	9.87	0.41	6.36	5.80	157.48	0.64
53	Bhitaura	Ganga	8.20	371.33	256.00	11.33	26.50	27.88	0.20	0.29	9.67	0.35	5.08	9.77	130.80	0.75
Ramganga Basin																
56	Seohara	Ramganga	7.89	319.00	235.00	6.67	17.28	16.93	0.11	0.24	8.17	0.25	7.49	3.54	125.38	0.51
57	Kazipura	Ramganga	7.91	331.33	243.67	3.67	18.44	15.81	0.12	0.20	7.17	0.27	6.68	3.02	136.03	0.52
58	Moradabad (R)	Ramganga	7.85	469.00	325.33	9.00	29.85	22.05	0.12	0.28	8.57	0.29	4.53	13.09	173.40	0.69
59	Tiharkheda	Ramganga	8.15	683.00	453.00	5.67	30.56	32.28	0.21	0.40	12.13	0.44	4.95	10.50	280.44	0.61
60	Bareilly	Ramganga	8.15	677.00	465.67	7.33	33.91	33.20	0.23	0.43	11.33	0.42	5.00	7.21	287.48	0.65
61	Dabri	Ramganga	8.35	684.33	458.33	4.67	31.85	33.86	0.24	0.34	9.87	0.36	6.62	4.52	275.22	0.60
62	Dhaneta	Baigul/Kichha	8.28	834.33	480.33	6.67	37.97	29.07	0.18	0.36	12.93	0.35	4.35	8.70	354.25	0.66
63	Shahjahanpur	Khannaut	8.21	462.00	323.67	5.33	15.65	16.40	0.25	0.33	8.80	0.31	4.00	7.60	196.73	0.37
64	Todarpur	Sukheta	8.33	425.67	294.67	4.67	13.33	21.46	0.16	0.31	14.10	0.28	5.79	6.08	193.38	0.32
Kali Basin																
65	Kasganj	Kali	7.97	815.67	469.00	13.33	41.97	27.30	0.35	0.51	16.10	0.56	1.99	18.75	290.20	0.81
66	Kannauj	Kali	8.13	567.67	361.00	7.00	36.94	27.62	0.34	0.47	11.33	0.44	5.65	12.68	208.86	0.84
Gomti Basin																
67	Sitapur	Sarayan	8.12	533.33	368.67	5.33	15.28	14.70	0.35	0.27	11.27	0.25	3.80	8.22	231.82	0.33
68	Neemsar	Gomti	8.36	444.67	299.00	3.33	11.47	15.49	0.27	0.24	8.97	0.21	7.22	1.87	205.26	0.27
69	Chandrika Devi	Gomti	8.40	477.67	337.00	5.33	15.42	16.27	0.32	0.20	9.63	0.26	6.68	2.72	190.30	0.37
70	Lucknow	Gomti	7.93	639.00	435.67	7.67	29.59	22.34	0.33	0.33	12.47	0.43	1.09	15.58	235.06	0.64
71	Gomtinagar	Gomti	7.97	732.00	464.00	10.67	35.20	24.24	0.34	0.42	13.30	0.60	1.55	17.78	257.30	0.73
72	Raebareli	Sai	8.24	573.67	361.00	7.33	30.94	31.89	0.34	0.27	12.97	0.44	3.76	7.09	201.86	0.72

Table 12: State-wise summary of Data

S. No.	WQ Site	River	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
Uttarakhand																
1	Bangapani	Gauriganga	8.14	392.33	249.33	3.33	10.12	36.55	0.25	0.14	8.03	0.14	8.11	2.49	193.78	0.24
2	Ghat	Saryu	8.33	375.67	248.33	1.00	9.48	13.12	0.17	0.13	8.33	0.14	8.37	1.27	168.15	0.24
3	Karnaprayag	Pinder	7.66	213.33	121.00	0.73	3.73	12.10	0.16	0.00	6.34	0.00	8.83	0.82	98.71	0.09
4	Karnaprayag Confluence U/S	Alaknanda	7.68	204.00	114.67	0.90	3.53	10.77	0.16	0.00	6.39	0.00	8.90	0.69	94.20	0.10
5	Karnaprayag Confluence D/S	Alaknanda	7.64	207.33	116.00	0.77	3.85	16.58	0.17	0.00	6.61	0.00	9.03	1.02	95.50	0.11
6	Augustmuni U/S	Mandakini	7.46	148.00	83.67	0.47	4.37	15.08	0.17	0.00	5.59	0.00	9.57	0.57	59.57	0.16
7	Augustmuni D/S	Mandakini	7.43	142.33	81.67	0.60	5.00	8.20	0.09	0.00	4.57	0.00	9.23	0.63	55.83	0.20
8	Rudraprayag (A)	Alaknanda	7.58	215.67	122.00	1.63	3.97	24.37	0.23	0.00	6.08	0.00	9.10	1.15	100.30	0.12
9	Srinagar	Alaknanda	7.61	204.67	115.67	1.53	4.20	21.40	0.21	0.00	6.62	0.00	9.10	1.15	92.13	0.13
10	Kirtinagar U/S	Alaknanda	7.52	206.67	116.67	1.47	4.23	21.03	0.20	0.00	6.71	0.00	9.03	1.08	95.09	0.12
11	Kirtinagar D/S	Alaknanda	7.56	210.67	118.67	1.63	4.27	21.50	0.21	0.00	6.82	0.00	8.76	1.14	94.18	0.12
12	Uttarkashi	Bhagirathi	7.67	177.67	101.67	1.10	5.43	29.67	0.32	0.00	7.12	0.00	9.63	0.70	74.62	0.17
13	Koteshwar	Bhagirathi	7.80	124.67	72.67	0.80	3.77	18.73	0.26	0.00	6.64	0.0	8.36	0.74	51.85	0.14
14	Satpuli U/S	Nayar	7.47	152.67	89.00	0.53	7.07	10.10	0.08	0.00	5.22	0.00	8.70	0.62	60.61	0.28
15	Satpuli D/S	Nayar	7.50	153.00	91.67	0.70	7.20	10.00	0.08	0.00	5.23	0.00	9.03	0.69	60.95	0.28
16	Devprayag	Ganga	7.29	157.00	91.33	1.37	4.00	20.30	0.27	0.00	7.00	0.00	9.03	0.89	66.80	0.13
17	Rishikesh U/S	Ganga	7.41	152.67	86.67	2.27	4.07	21.67	0.28	0.00	7.06	0.00	8.63	0.95	65.93	0.14
18	Rishikesh	Ganga	7.47	148.00	83.00	2.30	4.23	20.17	0.26	0.00	7.10	0.00	8.83	1.21	62.62	0.15
19	Rishikesh D/S	Ganga	7.49	153.67	90.00	2.50	4.43	20.63	0.27	0.00	7.15	0.00	8.63	1.14	64.34	0.16
20	Haridwar	Ganga	7.55	170.33	97.00	4.27	5.13	24.30	0.33	0.00	7.42	0.00	9.36	1.35	67.21	0.18
21	Haridwar U/S	Ganga	7.57	171.67	98.00	4.17	4.57	24.50	0.32	0.00	7.93	0.00	9.50	1.09	66.93	0.16
22	Haridwar D/S	Ganga	7.71	172.67	101.00	4.70	5.03	25.23	0.36	0.00	8.09	0.00	9.30	1.48	69.19	0.17
23	Roorkee U/S	Solani	7.52	972.33	548.67	18.87	71.52	17.39	0.42	0.00	8.76	0.13	0.00	21.33	281.62	2.14
24	Roorkee D/S	Solani	7.55	977.33	551.33	20.87	71.87	18.22	0.44	0.00	8.73	0.16	0.00	25.30	282.88	2.17

S. No.	WQ Site	River	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
Uttar Pradesh																
25	Kabirganj	Sharda	8.22	442.33	288.67	3.00	8.38	25.07	0.16	0.19	8.87	0.17	6.94	1.75	205.77	0.19
26	Paliakalan	Sharda	8.22	433.33	299.33	4.00	9.03	23.36	0.19	0.19	8.90	0.21	7.35	1.57	197.27	0.21
27	Parsohan Ghat	Burhi Rapti	8.03	577.00	356.67	3.00	11.87	10.17	0.18	0.16	7.53	0.14	7.65	2.31	264.02	0.24
28	Balrampur	Rapti	8.19	402.33	263.33	10.00	11.08	15.29	0.09	0.19	8.53	0.16	8.07	1.34	180.00	0.27
29	Bansi	Rapti	8.23	431.33	270.67	6.00	12.12	15.68	0.08	0.21	8.40	0.17	7.88	2.22	207.66	0.28
30	Regauli	Rapti	8.15	521.00	359.33	5.67	11.47	15.29	0.09	0.22	8.27	0.18	7.61	2.62	254.44	0.24
31	Gorakhpur U/S	Rapti	7.91	448.67	326.33	3.67	12.25	15.48	0.09	0.26	8.90	0.19	7.92	2.28	213.33	0.28
32	Birdghat	Rapti	8.23	463.00	320.00	5.67	13.66	16.08	0.13	0.26	10.07	0.23	7.70	2.87	213.33	0.31
33	Gorakhpur D/S	Rapti	8.13	453.00	311.33	5.00	14.12	16.67	0.13	0.26	9.60	0.24	7.13	3.22	201.59	0.33
34	Basti U/S	Kwano	8.04	525.33	359.33	5.00	17.79	11.75	0.30	0.19	6.23	0.18	5.74	6.29	219.11	0.40
35	Basti	Kwano	8.02	543.67	361.33	5.67	21.40	12.40	0.30	0.21	6.60	0.20	3.90	11.71	230.74	0.47
36	Basti D/S	Kwano	8.09	529.67	381.67	6.33	22.56	12.33	0.34	0.25	6.77	0.23	4.40	10.04	215.61	0.51
37	Elgin Bridge	Ghaghra	8.26	370.33	252.67	2.67	10.12	15.17	0.13	0.24	9.53	0.18	7.12	1.83	169.50	0.26
38	Faizabad U/S	Ghaghra	8.32	375.33	240.67	7.00	9.73	17.78	0.15	0.26	10.30	0.22	7.49	2.45	170.83	0.25
39	Ayodhya	Ghaghra	8.17	368.67	235.00	3.67	10.19	20.87	0.16	0.28	10.40	0.24	7.80	2.47	165.06	0.26
40	Tanda U/S	Ghaghra	8.24	370.67	278.00	4.67	11.35	21.98	0.15	0.25	10.67	0.22	7.27	2.32	167.74	0.29
41	Tanda D/S	Ghaghra	8.16	397.00	277.33	6.67	11.93	22.83	0.19	0.33	11.10	0.30	5.77	5.79	177.60	0.29
42	Turtipar	Ghaghra	8.16	447.87	303.79	5.17	12.96	16.92	0.17	0.24	9.01	0.21	6.97	3.67	201.85	0.32
43	Basantpur	Ganga	8.06	265.00	192.33	6.67	11.99	19.34	0.23	0.33	13.07	0.27	5.77	5.54	107.60	0.38
44	Garhmukteshwar	Ganga	8.13	277.33	201.67	6.00	11.67	25.20	0.22	0.33	9.73	0.25	6.73	5.90	117.99	0.34
45	Kachhlabridge	Ganga	8.20	291.00	213.67	9.33	12.57	24.93	0.23	0.28	10.20	0.26	7.90	2.20	123.39	0.37
46	Fatehgarh	Ganga	8.26	281.33	209.67	11.00	12.83	25.72	0.21	0.24	8.73	0.26	6.87	1.92	115.57	0.37
47	Hathikhana	Ganga	8.16	312.33	226.67	8.33	16.70	27.16	0.24	0.28	11.07	0.27	6.50	5.33	119.20	0.46
48	Katriumrauli	Ganga	8.29	381.00	263.67	6.33	13.79	28.15	0.19	0.35	8.87	0.30	6.00	5.97	176.50	0.33
49	Mehandipur	Ganga	8.20	441.67	326.00	7.33	24.69	26.77	0.21	0.38	9.93	0.31	5.86	10.16	180.82	0.61
50	Ankinghat	Ganga	8.27	418.33	303.67	7.33	17.60	27.23	0.22	0.33	8.77	0.30	7.29	2.03	184.32	0.42
51	Bithoor	Ganga	8.37	403.67	300.00	11.67	18.05	27.63	0.23	0.28	10.03	0.32	7.42	4.89	167.74	0.47
52	Parmarthghat	Ganga	8.36	387.33	276.67	13.67	18.18	27.04	0.23	0.27	10.20	0.33	7.50	4.60	150.48	0.48

S. No.	WQ Site	River	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
53	Kanpur	Ganga	8.35	419.33	305.33	9.33	19.08	28.48	0.26	0.29	10.10	0.37	7.20	4.83	167.34	0.49
54	Jajmau	Ganga	8.30	420.67	313.00	12.33	24.50	31.63	0.27	0.32	9.87	0.41	6.36	5.80	157.48	0.64
55	Bhitaura	Ganga	8.20	371.33	256.00	11.33	26.50	27.88	0.20	0.29	9.67	0.35	5.08	9.77	130.80	0.75
56	Seohara	Ramganga	7.89	319.00	235.00	6.67	17.28	16.93	0.11	0.24	8.17	0.25	7.49	3.54	125.38	0.51
57	Kazipura	Ramganga	7.91	331.33	243.67	3.67	18.44	15.81	0.12	0.20	7.17	0.27	6.68	3.02	136.03	0.52
58	Moradabad (R)	Ramganga	7.85	469.00	325.33	9.00	29.85	22.05	0.12	0.28	8.57	0.29	4.53	13.09	173.40	0.69
59	Tiharkheda	Ramganga	8.15	683.00	453.00	5.67	30.56	32.28	0.21	0.40	12.13	0.44	4.95	10.50	280.44	0.61
60	Bareilly	Ramganga	8.15	677.00	465.67	7.33	33.91	33.20	0.23	0.43	11.33	0.42	5.00	7.21	287.48	0.65
61	Dabri	Ramganga	8.35	684.33	458.33	4.67	31.85	33.86	0.24	0.34	9.87	0.36	6.62	4.52	275.22	0.60
62	Dhaneta	Baigul/Kichha	8.28	834.33	480.33	6.67	37.97	29.07	0.18	0.36	12.93	0.35	4.35	8.70	354.25	0.66
63	Shahjahanpur	Khannaut	8.21	462.00	323.67	5.33	15.65	16.40	0.25	0.33	8.80	0.31	4.00	7.60	196.73	0.37
64	Todarpur	Sukheta	8.33	425.67	294.67	4.67	13.33	21.46	0.16	0.31	14.10	0.28	5.79	6.08	193.38	0.32
65	Kasganj	Kali	7.97	815.67	469.00	13.33	41.97	27.30	0.35	0.51	16.10	0.56	1.99	18.75	290.20	0.81
66	Kannauj	Kali	8.13	567.67	361.00	7.00	36.94	27.62	0.34	0.47	11.33	0.44	5.65	12.68	208.86	0.84
67	Sitapur	Sarayan	8.12	533.33	368.67	5.33	15.28	14.70	0.35	0.27	11.27	0.25	3.80	8.22	231.82	0.33
68	Neemsar	Gomti	8.36	444.67	299.00	3.33	11.47	15.49	0.27	0.24	8.97	0.21	7.22	1.87	205.26	0.27
69	Chandrika Devi	Gomti	8.40	477.67	337.00	5.33	15.42	16.27	0.32	0.20	9.63	0.26	6.68	2.72	190.30	0.37
70	Lucknow	Gomti	7.93	639.00	435.67	7.67	29.59	22.34	0.33	0.33	12.47	0.43	1.09	15.58	235.06	0.64
71	Gomtinagar	Gomti	7.97	732.00	464.00	10.67	35.20	24.24	0.34	0.42	13.30	0.60	1.55	17.78	257.30	0.73
72	Raebareli	Sai	8.24	573.67	361.00	7.33	30.94	31.89	0.34	0.27	12.97	0.44	3.76	7.09	201.86	0.72

Table 13: Division-wise summary of Data

S. No.	WQ Site	River	State	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
HGD, Haridwar																	
1	Karnaprayag	Pinder	UK	7.66	213.33	121.00	0.73	3.73	12.10	0.16	0.00	6.34	0.00	8.83	0.82	98.71	0.09
2	Karnaprayag Confluence U/S	Alaknanda	UK	7.68	204.00	114.67	0.90	3.53	10.77	0.16	0.00	6.39	0.00	8.90	0.69	94.20	0.10
3	Karnaprayag Confluence D/S	Alaknanda	UK	7.64	207.33	116.00	0.77	3.85	16.58	0.17	0.00	6.61	0.00	9.03	1.02	95.50	0.11
4	Augustmuni U/S	Mandakini	UK	7.46	148.00	83.67	0.47	4.37	15.08	0.17	0.00	5.59	0.00	9.57	0.57	59.57	0.16
5	Augustmuni D/S	Mandakini	UK	7.43	142.33	81.67	0.60	5.00	8.20	0.09	0.00	4.57	0.00	9.23	0.63	55.83	0.20
6	Rudraprayag (A)	Alaknanda	UK	7.58	215.67	122.00	1.63	3.97	24.37	0.23	0.00	6.08	0.00	9.10	1.15	100.30	0.12
7	Srinagar	Alaknanda	UK	7.61	204.67	115.67	1.53	4.20	21.40	0.21	0.00	6.62	0.00	9.10	1.15	92.13	0.13
8	Kirtinagar U/S	Alaknanda	UK	7.52	206.67	116.67	1.47	4.23	21.03	0.20	0.00	6.71	0.00	9.03	1.08	95.09	0.12
9	Kirtinagar D/S	Alaknanda	UK	7.56	210.67	118.67	1.63	4.27	21.50	0.21	0.00	6.82	0.00	8.76	1.14	94.18	0.12
10	Uttarkashi	Bhagirathi	UK	7.67	177.67	101.67	1.10	5.43	29.67	0.32	0.00	7.12	0.00	9.63	0.70	74.62	0.17
11	Koteshwar	Bhagirathi	UK	7.80	124.67	72.67	0.80	3.77	18.73	0.26	0.00	6.64	0.0	8.36	0.74	51.85	0.14
12	Satpuli U/S	Nayar	UK	7.47	152.67	89.00	0.53	7.07	10.10	0.08	0.00	5.22	0.00	8.70	0.62	60.61	0.28
13	Satpuli D/S	Nayar	UK	7.50	153.00	91.67	0.70	7.20	10.00	0.08	0.00	5.23	0.00	9.03	0.69	60.95	0.28
14	Devprayag	Ganga	UK	7.29	157.00	91.33	1.37	4.00	20.30	0.27	0.00	7.00	0.00	9.03	0.89	66.80	0.13
15	Rishikesh U/S	Ganga	UK	7.41	152.67	86.67	2.27	4.07	21.67	0.28	0.00	7.06	0.00	8.63	0.95	65.93	0.14
16	Rishikesh	Ganga	UK	7.47	148.00	83.00	2.30	4.23	20.17	0.26	0.00	7.10	0.00	8.83	1.21	62.62	0.15
17	Rishikesh D/S	Ganga	UK	7.49	153.67	90.00	2.50	4.43	20.63	0.27	0.00	7.15	0.00	8.63	1.14	64.34	0.16
18	Haridwar	Ganga	UK	7.55	170.33	97.00	4.27	5.13	24.30	0.33	0.00	7.42	0.00	9.36	1.35	67.21	0.18
19	Haridwar U/S	Ganga	UK	7.57	171.67	98.00	4.17	4.57	24.50	0.32	0.00	7.93	0.00	9.50	1.09	66.93	0.16
20	Haridwar D/S	Ganga	UK	7.71	172.67	101.00	4.70	5.03	25.23	0.36	0.00	8.09	0.00	9.30	1.48	69.19	0.17
21	Roorkee U/S	Solani	UK	7.52	972.33	548.67	18.87	71.52	17.39	0.42	0.00	8.76	0.13	0.00	21.33	281.62	2.14
22	Roorkee D/S	Solani	UK	7.55	977.33	551.33	20.87	71.87	18.22	0.44	0.00	8.73	0.16	0.00	25.30	282.88	2.17
MGD-I, Lucknow																	
23	Bangapani	Gauriganga	UK	8.14	392.33	249.33	3.33	10.12	36.55	0.25	0.14	8.03	0.14	8.11	2.49	193.78	0.24
24	Ghat	Saryu	UK	8.33	375.67	248.33	1.00	9.48	13.12	0.17	0.13	8.33	0.14	8.37	1.27	168.15	0.24
25	Kabirganj	Sharda	UP	8.22	442.33	288.67	3.00	8.38	25.07	0.16	0.19	8.87	0.17	6.94	1.75	205.77	0.19

S. No.	WQ Site	River	State	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
26	Paliakalan	Sharda	UP	8.22	433.33	299.33	4.00	9.03	23.36	0.19	0.19	8.90	0.21	7.35	1.57	197.27	0.21
27	Parsohan Ghat	Burhi Rapti	UP	8.03	577.00	356.67	3.00	11.87	10.17	0.18	0.16	7.53	0.14	7.65	2.31	264.02	0.24
28	Balrampur	Rapti	UP	8.19	402.33	263.33	10.00	11.08	15.29	0.09	0.19	8.53	0.16	8.07	1.34	180.00	0.27
29	Bansi	Rapti	UP	8.23	431.33	270.67	6.00	12.12	15.68	0.08	0.21	8.40	0.17	7.88	2.22	207.66	0.28
30	Regauli	Rapti	UP	8.15	521.00	359.33	5.67	11.47	15.29	0.09	0.22	8.27	0.18	7.61	2.62	254.44	0.24
31	Gorakhpur U/S	Rapti	UP	7.91	448.67	326.33	3.67	12.25	15.48	0.09	0.26	8.90	0.19	7.92	2.28	213.33	0.28
32	Birdghat	Rapti	UP	8.23	463.00	320.00	5.67	13.66	16.08	0.13	0.26	10.07	0.23	7.70	2.87	213.33	0.31
33	Gorakhpur D/S	Rapti	UP	8.13	453.00	311.33	5.00	14.12	16.67	0.13	0.26	9.60	0.24	7.13	3.22	201.59	0.33
34	Basti U/S	Kwano	UP	8.04	525.33	359.33	5.00	17.79	11.75	0.30	0.19	6.23	0.18	5.74	6.29	219.11	0.40
35	Basti	Kwano	UP	8.02	543.67	361.33	5.67	21.40	12.40	0.30	0.21	6.60	0.20	3.90	11.71	230.74	0.47
36	Basti D/S	Kwano	UP	8.09	529.67	381.67	6.33	22.56	12.33	0.34	0.25	6.77	0.23	4.40	10.04	215.61	0.51
37	Elgin Bridge	Ghaghra	UP	8.26	370.33	252.67	2.67	10.12	15.17	0.13	0.24	9.53	0.18	7.12	1.83	169.50	0.26
38	Faizabad U/S	Ghaghra	UP	8.32	375.33	240.67	7.00	9.73	17.78	0.15	0.26	10.30	0.22	7.49	2.45	170.83	0.25
39	Ayodhya	Ghaghra	UP	8.17	368.67	235.00	3.67	10.19	20.87	0.16	0.28	10.40	0.24	7.80	2.47	165.06	0.26
40	Tanda U/S	Ghaghra	UP	8.24	370.67	278.00	4.67	11.35	21.98	0.15	0.25	10.67	0.22	7.27	2.32	167.74	0.29
41	Tanda D/S	Ghaghra	UP	8.16	397.00	277.33	6.67	11.93	22.83	0.19	0.33	11.10	0.30	5.77	5.79	177.60	0.29
42	Turtipar	Ghaghra	UP	8.16	447.87	303.79	5.17	12.96	16.92	0.17	0.24	9.01	0.21	6.97	3.67	201.85	0.32
MGD-II, Lucknow																	
43	Basantpur	Ganga	UP	8.06	265.00	192.33	6.67	11.99	19.34	0.23	0.33	13.07	0.27	5.77	5.54	107.60	0.38
44	Garhmukteshwar	Ganga	UP	8.13	277.33	201.67	6.00	11.67	25.20	0.22	0.33	9.73	0.25	6.73	5.90	117.99	0.34
45	Kachhlabridge	Ganga	UP	8.20	291.00	213.67	9.33	12.57	24.93	0.23	0.28	10.20	0.26	7.90	2.20	123.39	0.37
46	Fatehgarh	Ganga	UP	8.26	281.33	209.67	11.00	12.83	25.72	0.21	0.24	8.73	0.26	6.87	1.92	115.57	0.37
47	Hathikhana	Ganga	UP	8.16	312.33	226.67	8.33	16.70	27.16	0.24	0.28	11.07	0.27	6.50	5.33	119.20	0.46
48	Katriumrauli	Ganga	UP	8.29	381.00	263.67	6.33	13.79	28.15	0.19	0.35	8.87	0.30	6.00	5.97	176.50	0.33
49	Mehandipur	Ganga	UP	8.20	441.67	326.00	7.33	24.69	26.77	0.21	0.38	9.93	0.31	5.86	10.16	180.82	0.61
50	Ankinghat	Ganga	UP	8.27	418.33	303.67	7.33	17.60	27.23	0.22	0.33	8.77	0.30	7.29	2.03	184.32	0.42
51	Bithoor	Ganga	UP	8.37	403.67	300.00	11.67	18.05	27.63	0.23	0.28	10.03	0.32	7.42	4.89	167.74	0.47
52	Parmarthghat	Ganga	UP	8.36	387.33	276.67	13.67	18.18	27.04	0.23	0.27	10.20	0.33	7.50	4.60	150.48	0.48
53	Kanpur	Ganga	UP	8.35	419.33	305.33	9.33	19.08	28.48	0.26	0.29	10.10	0.37	7.20	4.83	167.34	0.49
54	Jajmau	Ganga	UP	8.30	420.67	313.00	12.33	24.50	31.63	0.27	0.32	9.87	0.41	6.36	5.80	157.48	0.64

S. No.	WQ Site	River	State	pH	EC (µS/cm)	TDS (mg/L)	Turbidity (NTU)	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	F- (mg/L)	B (mg/L)	SiO2 (mg/L)	NH_3-N	DO (mg/L)	BOD (mg/L)	TH	SAR
55	Bhitaura	Ganga	UP	8.20	371.33	256.00	11.33	26.50	27.88	0.20	0.29	9.67	0.35	5.08	9.77	130.80	0.75
56	Seohara	Ramganga	UP	7.89	319.00	235.00	6.67	17.28	16.93	0.11	0.24	8.17	0.25	7.49	3.54	125.38	0.51
57	Kazipura	Ramganga	UP	7.91	331.33	243.67	3.67	18.44	15.81	0.12	0.20	7.17	0.27	6.68	3.02	136.03	0.52
58	Moradabad (R)	Ramganga	UP	7.85	469.00	325.33	9.00	29.85	22.05	0.12	0.28	8.57	0.29	4.53	13.09	173.40	0.69
59	Tiharkheda	Ramganga	UP	8.15	683.00	453.00	5.67	30.56	32.28	0.21	0.40	12.13	0.44	4.95	10.50	280.44	0.61
60	Bareilly	Ramganga	UP	8.15	677.00	465.67	7.33	33.91	33.20	0.23	0.43	11.33	0.42	5.00	7.21	287.48	0.65
61	Dabri	Ramganga	UP	8.35	684.33	458.33	4.67	31.85	33.86	0.24	0.34	9.87	0.36	6.62	4.52	275.22	0.60
62	Dhaneta	Baigul/Kichha	UP	8.28	834.33	480.33	6.67	37.97	29.07	0.18	0.36	12.93	0.35	4.35	8.70	354.25	0.66
63	Shahjahanpur	Khannaut	UP	8.21	462.00	323.67	5.33	15.65	16.40	0.25	0.33	8.80	0.31	4.00	7.60	196.73	0.37
64	Todarpur	Sukheta	UP	8.33	425.67	294.67	4.67	13.33	21.46	0.16	0.31	14.10	0.28	5.79	6.08	193.38	0.32
65	Kasganj	Kali	UP	7.97	815.67	469.00	13.33	41.97	27.30	0.35	0.51	16.10	0.56	1.99	18.75	290.20	0.81
66	Kannauj	Kali	UP	8.13	567.67	361.00	7.00	36.94	27.62	0.34	0.47	11.33	0.44	5.65	12.68	208.86	0.84
67	Sitapur	Sarayan	UP	8.12	533.33	368.67	5.33	15.28	14.70	0.35	0.27	11.27	0.25	3.80	8.22	231.82	0.33
68	Neemsar	Gomti	UP	8.36	444.67	299.00	3.33	11.47	15.49	0.27	0.24	8.97	0.21	7.22	1.87	205.26	0.27
69	Chandrika Devi	Gomti	UP	8.40	477.67	337.00	5.33	15.42	16.27	0.32	0.20	9.63	0.26	6.68	2.72	190.30	0.37
70	Lucknow	Gomti	UP	7.93	639.00	435.67	7.67	29.59	22.34	0.33	0.33	12.47	0.43	1.09	15.58	235.06	0.64
71	Gomtinagar	Gomti	UP	7.97	732.00	464.00	10.67	35.20	24.24	0.34	0.42	13.30	0.60	1.55	17.78	257.30	0.73
72	Raebareli	Sai	UP	8.24	573.67	361.00	7.33	30.94	31.89	0.34	0.27	12.97	0.44	3.76	7.09	201.86	0.72

Comparison of data with Hot-Spot report of 2010-2020:

The water quality data obtained for this month has been compared with the monsoon period data given in report published on Water Quality Hot-Spots in Indian Rivers in November, 2021. The details thereof are given as below.

Table 14: Stations having DO < 5 mg/L *("*" Not a hot-spot in 2021 report)*

S. No.	WQ Site	River	State	DO	Non- Monsoon 2021
1.	Basti	Kwano	Uttar Pradesh	3.90	*
2.	Basti D/S	Kwano	Uttar Pradesh	4.40	*
3.	Roorkee U/S	Solani	Uttarakhand	0.00	0.94
4.	Roorkee D/S	Solani	Uttarakhand	0.00	0.75
5.	Moradabad (R)	Ramganga	Uttar Pradesh	4.53	*
6.	Tiharkhera	Ramganga	Uttar Pradesh	4.95	*
7.	Bareilly	Ramganga	Uttar Pradesh	5.00	*
8.	Dhaneta	Baigul/Kichha	Uttar Pradesh	4.35	*
9.	Shahjahanpur	Khannaut	Uttar Pradesh	4.00	*
10.	Kasganj	Kali	Uttar Pradesh	1.99	*
11.	Sitapur	Sarayan	Uttar Pradesh	3.80	*
12.	Lucknow	Gomti	Uttar Pradesh	1.09	*
13.	Gomtinagar	Gomti	Uttar Pradesh	1.55	*
14.	Raebareli	Sai	Uttar Pradesh	3.76	*

Table 15: Stations having BOD > 3 mg/L *("*" Not a hot-spot in 2021 report)*

S. No.	WQ Site	River	State	BOD	Non- Monsoon 2021
1.	Roorkee U/S	Solani	Uttarakhand	21.33	55.88
2.	Roorkee D/S	Solani	Uttarakhand	25.30	60.01
3.	Basantpur	Ganga	Uttar Pradesh	5.54	*
4.	Garhmukteshwar	Ganga	Uttar Pradesh	5.90	*
5.	Hathikhana	Ganga	Uttar Pradesh	5.33	*
6.	Katriumrauli	Ganga	Uttar Pradesh	5.97	*
7.	Mehandipur	Ganga	Uttar Pradesh	10.16	*
8.	Bithoor	Ganga	Uttar Pradesh	4.89	*
9.	Parmathghat	Ganga	Uttar Pradesh	4.60	*
10.	Kanpur	Ganga	Uttar Pradesh	4.83	5.67
11.	Jajmau	Ganga	Uttar Pradesh	5.80	*
12.	Bhitaura	Ganga	Uttar Pradesh	9.77	*
13.	Seohara	Ramganga	Uttar Pradesh	3.54	*
14.	Kazipura	Ramganga	Uttar Pradesh	3.02	*
15.	Moradabad (R)	Ramganga	Uttar Pradesh	13.09	*
16.	Tiharkheda	Ramganga	Uttar Pradesh	10.50	*
17.	Bareilly	Ramganga	Uttar Pradesh	7.21	*
18.	Dabri	Ramganga	Uttar Pradesh	4.52	*
19.	Dhaneta	Baigul/Kichha	Uttar Pradesh	8.70	*
20.	Shahjahanpur	Khannaut	Uttar Pradesh	7.60	*
21.	Todarpur	Sukheta	Uttar Pradesh	6.08	*
22.	Kasganj	Kali	Uttar Pradesh	18.75	*
23.	Kannauj	Kali	Uttar Pradesh	12.68	*
24.	Sitapur	Sarayan	Uttar Pradesh	8.22	*

25.	Lucknow	Gomti	Uttar Pradesh	15.58	*
26.	Gomtinagar	Gomti	Uttar Pradesh	17.78	*
27.	Raebareli	Sai	Uttar Pradesh	7.09	*
28.	Gorakhpur D/S	Rapti	Uttar Pradesh	3.22	3.9
29.	Basti U/S	Kwano	Uttar Pradesh	6.29	6.05
30.	Basti	Kwano	Uttar Pradesh	11.71	*
31.	Basti D/S	Kwano	Uttar Pradesh	10.04	*
32.	Tanda D/S	Ghaghra	Uttar Pradesh	5.79	*
33.	Turtipar	Ghaghra	Uttar Pradesh	3.67	*

Water Quality status of rivers:

- pH value ranges from 6.83 to 8.47 which is above the acceptable limit of 6.5-8.5 as per IS 10500:2012.
- EC value ranges from to 122 to 998 µmho/cm, which is within the tolerance limit or Class E water as per CPCB.
- TDS value ranges from 69 to 566 mg/l, which is below permissible limit of 2000 mg/l as per IS 10500:2012. Values above acceptable limit of 500 mg/l found at Roorkee U/S and Roorkee D/S.
- Turbidity value ranges from 0.3 to 22.6 NTU. Except for Bangapani, Ghat, Kabirganj, Paliakalan, Parsohanghat, Gorakhpur U/S, Elginbridge, Ayodhya, Tanda U/S, all sites under HGD (except Solani River), Kazipura, Dabri, Todarpur & Neemsar, average turbidity for all other stations is above the permissible limit of 5 NTU as per IS 10500:2012.
- Calcium value ranges from 13.61 to 94.79 mg/l, which is within the permissible limit of 200mg/l as per IS 10500:2012. Calcium is found above acceptable limit of 75mg/l at Tiharkhera site.
- Magnesium value ranges from 0.33 to 55.61 mg/l, which is within permissible limit of 100mg/l as per IS 10500:2012. Magnesium is found above acceptable limit of 30mg/l at Dhaneta, Kashganj, Lucknow & Gomtinagar sites.
- DO value ranges from 0 to 10.07 mg/l. This means that some WQ samples are not suitable for Class A, B, C, D water as per CPCB as below:
  - Water quality stations Basti U/S, Basti, Basti D/S, Tanda D/S, Roorkee U/S, Roorkee D/S, Mehandipur, Basantpur, Bhitaura, Moradabad(R), Dhaneta, Shahjahanpur, Kasganj, Kannauj, Tiharkhera, Bareilly, Tondarpur, Neemsar, Sitapur, Lucknow, Gomtinagar and Raebareli site found not suitable for class A.
  - Water quality stations Basti, Basti D/S, Roorkee U/S, Roorkee D/S, Dhaneta, Shahjahanpur, Kasganj, Sitapur, Bareilly, Tiharkhera, Moradabad (R), Lucknow, Gomtinagar and Raebareli site found not suitable for class B.
  - Water quality stations Roorkee U/S, Roorkee D/S, Basti, Shahjahanpur, Kasganj, Sitapur, Lucknow Gomtinagar and Raebareli site found not suitable for class C & D.
- BOD value ranges from 0.52 to 28 mg/l. This means that some WQ samples are not suitable for Class A, B, C, D water as per CPCB as below:
  - Water quality stations Roorkee U/S, Roorkee D/S, all sites under MGD-1 (except Ghat, Kabirganj, Balrampur, Paliakalan & Elginbridge) and MGD-2 (except Fatehgarh & Neemsar) found not suitable for class A & D.
  - Water quality stations on Kwano and Solani River, Birdghat, Gorakhpur D/S, Tanda D/S, Turtipar and all sites under MGD-2 (except Kachhlabridge, Fatehgarh, Ankinghat, Neemsar & Chandrika Devi) found not suitable for class B & C.
- 21 samples have been tested for Total Coliform, all of which are above permissible limit of 500 MPN/100ml for class B.
- All other parameters are within acceptable limit as per IS 10500:2012 and CPCB best use criteria.

Specific Locations (Hotspot) with Consistently Poor Water Quality:

"Hotspot" is defined based on the location/site where concentration of a particular parameter is beyond the permissible limits as prescribed drinking water quality standard in the BIS code IS 10500:2012 & "Designated Best Use Water Quality Criteria" by CPCB. Sites at which average DO/BOD are below/above permissible limit for multiple months (since Mar-2024) have been included in the table below.

Table 16: Identified Hotspots and potential source of contamination

S. No.	WQ Sites	Parameters that are not consistently within permissible limits		Sources of Contamination
		DO	BOD	
1.	Roorkee U/S	Values lower than permissible limits	Values higher than permissible limits	Roorkee city sewage drains into the Solani River
2.	Roorkee D/S	Values lower than permissible limits	Values higher than permissible limits	Roorkee city sewage drains into the Solani River
3.	Garhmukteshwar	-	Values higher than permissible limits	Drainage from Gajraula industrial town may contaminate and pesticides in farm fields.
4.	Kachhlabridge	-	Values higher than permissible limits	The drain coming from Ganga mahawa, 9 km U/S from site may contaminate as drainage from Bilsi and Sahaswan town also come in it and drain coming from Lahra town.
5.	Fatehgarh	-	Values higher than permissible limits	Sewage drains into River.
6.	Hathikhana	Values lower than permissible limits	Values higher than permissible limits	Sewage drains into River.
7.	Katriumrauli	-	Values higher than permissible limits	Sewage drains into river.
8.	Mehandipur	Values lower than permissible limits	Values higher than permissible limits	-
9.	Ankinghat	Values lower than permissible limits	Values higher than permissible limits	Human Interference and sample collected from River bank.
10.	Bithoor	-	Values higher than permissible limits	Human Interference.
11.	Parmarthghat	-	Values higher than permissible limits	Drainage of Sisamau Nala.
12.	Kanpur	-	Values higher than permissible limits	Human Interference and sample collected from River bank.
13.	Jajmau	Values lower than permissible limits	Values higher than permissible limits	In U/s drainage of leather factory.
14.	Bhitaura	Values lower than permissible limits	Values higher than permissible limits	Cremation ground on the site.
15.	Seohara	-	Values higher than permissible limits	Drainage from Seohara and Dhampur industrial town may contaminate and pesticides in farm fields.
16.	Kazipura	Values lower than permissible limits	Values higher than permissible limits	Industrial sewage.
17.	Moradabad (R)	Values lower than	Values higher than	Municipal Sewage.

S. No.	WQ Sites	Parameters that are not consistently within permissible limits		Sources of Contamination
		DO	BOD	
		permissible limits	permissible limits	
18.	Tiharkheda	Values lower than permissible limits	Values higher than permissible limits	Contaminated water drainage found near Soopa village which comes through Nababganj (Rampur) and Low water level/Discharge.
19.	Bareilly	Values lower than permissible limits	Values higher than permissible limits	Drain 10 km U/s at C.B. Ganj and Low water level/Discharge.
20.	Dabri	Values lower than permissible limits	Values higher than permissible limits	D/s of Bareilly Site hence concentration level is high.
21.	Dhaneta	Values lower than permissible limits	Values higher than permissible limits	Drain 10 km U/s at Sahi and Low water level/Discharge.
22.	Shahjahanpur	Values lower than permissible limits	Values higher than permissible limits	Shahjahanpur city sewage drains into the Khannaut River
23.	Todarpur	Values lower than permissible limits	Values higher than permissible limits	City sewage drains into the Sukheta River
24.	Kasganj	Values lower than permissible limits	Values higher than permissible limits	500 m U/s drainage of Beer Factory.
25.	Kannauj	Values lower than permissible limits	Values higher than permissible limits	Drainage of Beer Factory and Sewage of city.
26.	Sitapur	Values lower than permissible limits	Values higher than permissible limits	Sitapur city sewage drains into the Sarayan River.
27.	Neemsar	Values lower than permissible limits	Values higher than permissible limits	Neemsar city sewage drains into the Gomti River.
28.	Chandrika Devi	Values lower than permissible limits	Values higher than permissible limits	city sewage drains into the Gomti River.
29.	Lucknow	Values lower than permissible limits	Values higher than permissible limits	Lucknow city sewage drains into the Gomti River
30.	Gomtinagar	Values lower than permissible limits	Values higher than permissible limits	Lucknow city sewage drains into the Gomti River
31.	Raebareli	Values lower than permissible limits	Values higher than permissible limits	Raebareli city sewage drains into the Sai River
32.	Ghat	-	Values higher than Permissible limits	Domestic sewage drains into river.
33.	Paliakalan	-	Values higher than Permissible limits	Domestic sewage drains into river.
34.	Parsohan Ghat	Values lower than Permissible limits	Values higher than Permissible limits	Domestic sewage drains into river.
35.	Balrampur	-	Values higher than Permissible limits	-
36.	Bansi	Values lower than Permissible limits	Values higher than Permissible limits	Domestic sewage drains into river.
37.	Regauli	-	Values higher than Permissible limits	Domestic sewage drains into river.
38.	Gorakhpur U/S	-	Values higher than Permissible limits	Domestic sewage drains into river.
39.	Birdghat	-	Values higher than Permissible limits	Domestic sewage drains into river.
40.	Gorakhpur D/S	-	Values higher than	Gorakhpur city sewage drains into

S. No.	WQ Sites	Parameters that are not consistently within permissible limits		Sources of Contamination
		DO	BOD	
			Permissible limits	the Rapti River, Cremation ground.
41.	Basti U/S	Values lower than Permissible limits	Values higher than Permissible limits	Domestic sewage and waste Discharge from paper mills, Cremation ground.
42.	Basti	Values lower than Permissible limits	Values higher than Permissible limits	Domestic sewage and waste Discharge from paper mills, Cremation ground.
43.	Basti D/S	Values lower than Permissible limits	Values higher than Permissible limits	Domestic sewage and waste Discharge from paper mills, Cremation ground.
44.	Elgin Bridge	-	Values higher than Permissible limits	Domestic sewage and waste.
45.	Tanda D/S	-	Values higher than Permissible limits	Tanda city sewage drains into the Ghaghra River, Cremation ground, NTPC Plant.
46.	Ayodhya	-	Values higher than Permissible limits	Domestic sewage and waste Discharge from Cremation ground.
47.	Turtipar	-	Values higher than Permissible limits	-

Table 17: Number of Sites having DO below and/or BOD above permissible limit

	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25
DO below permissible limit (exclusive)	0	0	0	0	0	0	0	0	0
BOD above permissible limit (exclusive)	16	18	15	24	17	17	16	28	26
DO below and BOD above permissible limit	23	26	19	16	14	13	11	11	7
Total	**39**	**44**	**34**	**40**	**31**	**30**	**27**	**39**	**33**

Table 18: Monthly Visual representation for DO below and/or BOD above permissible limit

Name of Site	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25
Bangapani									
Ghat									
Kabirganj									
Paliakalan									
Parsohan Ghat									
Balrampur									
Bansi									
Regauli									
Gorakhpur U/S									
Birdghat									
Gorakhpur D/S									

Basti U/S									
Basti									
Basti D/S									
Elgin Bridge									
Faizabad U/S									
Ayodhya									
Tanda U/S									
Tanda D/S									
Turtipar									
Karnaprayag									
Karnaprayag Confluence U/S									
Karnaprayag Confluence D/S									
Augustmuni U/S									
Augustmuni D/S									
Rudraprayag (A)									
Srinagar									
Kirtinagar U/S									
Kirtinagar D/S									
Uttarkashi									
Koteshwar									
Satpuli U/S									
Satpuli D/S									
Devprayag									
Rishikesh U/S									
Rishikesh									
Rishikesh D/S									
Haridwar									
Haridwar U/S									
Haridwar D/S									
Roorkee U/S									
Roorkee D/S									
Basantpur									
Garhmukteshwar									
Kachhlabridge									
Fatehgarh									
Hathikhana									
Katriumrauli									
Mehandipur									
Ankinghat									
Bithoor									
Parmarthghat									
Kanpur									
Jajmau									
Bhitaura									
Seohara									
Kazipura									
Moradabad (R)									
Tiharkheda									
Bareilly									

Dabri									
Dhaneta									
Shahjahanpur									
Todarpur									
Kasganj									
Kannauj									
Sitapur									
Neemsar									
Chandrika Devi									
Lucknow									
Gomtinagar									
Raebareli									

Colour Code:

DO below permissible limit(exclusive)

BOD above permissible limit (exclusive)

DO below and BOD above permissible limit

6-CONCLUSION

- The mineral content of river water tends to increase from source to mouth, although the increase may not be continuous or uniform. Other factors like discharge of city wastewater, industrial waste and mixing of waters can also affect the nature and concentration of minerals in surface water.
- River Water of stations under UGBO is alkaline in nature. The pH values are within the range of Class C limit of Best Designated Use Criteria at all WQ stations.
- Observed EC, Boron and SAR are within the limit of CPCB's Class E limit of Best Designated Use Criteria at all WQ stations.
- Observed TDS, Total Hardness, Chloride, and Fluoride concentrations are within the permissible limit of BIS Drinking Water Standard at all water quality stations.
- The water of all the mentioned sites is having adequate amount of minerals and elements such as Calcium, Magnesium, Bicarbonate, Chloride, Sulphate, Phosphate, Silicate etc.
- As Solani River receives sewage or industrial effluents from the city of Roorkee, during non-monsoon the flows may contain high sodium levels due to the presence of sodium-based compounds. These effluents may increase sodium levels in rivers, while chloride levels do not increase uniformly.
- DO values are lower than permissible limits of class D at many WQ sites and high BOD values found at the many WQ sites; this can have a negative impact on aquatic life.
- The High turbidity levels found at many of the sites, which will reduce light penetration into the water column thus affecting the ability of submerged aquatic plants to photosynthesize, reducing biomass and growth rates of aquatic plants.
- All samples tested for Total Coliform have values above the permissible limit.

To effectively tackle the issue of water pollution, it is essential to identify the causes of pollution. As per understanding of this office, direct disposal of untreated domestic sewage, industrial effluents, agricultural wastage, urbanization, industrialization etc., lead to major sources of river water pollution. Though substantial efforts are required for reduction of river water pollution and rejuvenation of river, the following may act as effective solution for reduction of pollution. Some of the anticipated pollution control measures are listed below:

1. Wastewater treatment prior to disposal in rivers.
2. Reduction of solid waste.
3. Green agriculture.
4. Denitrification.
5. Minimize the uses of fertilizers and pesticides with promoting Organic Farming.
6. Careful planning of urban growth and subdivisions.
7. Mass Awareness & Education for maintenance of river health.

7-APPENDIX

Table of River Water Quality data of Month Feb-2025 attached as Annexure-I.

8-ABBREVIATION

1-	APHA	-	American Public Health Association
2-	ASD	-	Alaknanda Sub Division
3-	BOD	-	Biochemical Oxygen Demand
4-	BSD	-	Bhagirathi Sub Division
5-	COD	-	Chemical Oxygen Demand
6-	DO	-	Dissolved Oxygen
7-	EC	-	Electrical Conductivity
8-	GSD	-	Gomti Sub Division
9-	HGD	-	Himalayan Ganga Division
10-	HGDWQL	-	Himalayan Ganga Division Water Quality Lab
11-	HO	-	Hydrological Observations
12-	HOC	-	Hydrological Observation Circle
13-	LRSD	-	Lower Rapti Sub Division
14-	M&A	-	Monitoring And Appraisal
15-	MGD	-	Middle Ganga Division
16-	MGDWQL	-	Middle Ganga Division Water Quality Lab
17-	MGLRSD	-	Middle Ganga Lower Ramganga Sub Division
18-	MGSD	-	Middle Ganga Sub Division
19-	MGURSD	-	Middle Ganga Upper Ramganga Sub Division
20-	NABL	-	National Accreditation Board for Testing and Calibration Laboratories
21-	NH3-N	-	Ammonical Nitrogen
22-	RO	-	Regional Organisation
23-	SAR	-	Sodium Absorption Ratio
24-	TDS	-	Total Dissolved Solids
25-	UGBO	-	Upper Ganga Basin Organisation
26-	UGSD	-	Upper Ganga Sub Division
27-	URSD	-	Upper Rapti Sub Division
28-	USSD	-	Upper Sharda Sub Division
29-	WQSS	-	Water Quality Sampling Station

Office of Chief Engineer
Upper Ganga Basin Organisation
Central Water Commission

'Jahnvi Sadan', 21/496, Sector 21,
Indira Nagar, Lucknow-226016