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GOVERNMENT OF INDIA
Ministry of Jal Shakti
Department of Water Resources
River Development and Ganga Rejuvenation

Report on Water Quality Hot-spots in Rivers of India

(7th Edition)

(January to December 2024)

Central Water Commission

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Water, the world's most valuable natural resource, is essential for the survival of all living organisms on the earth. With population growth, industrial development, urbanisation & agricultural activities, the demand & consumption for freshwater is rising. This has caused increased utilisation of water from rivers, lakes and other water sources affecting the diversity of flora and fauna. Further, after utilisation by industries, agriculture, human settlements etc., the effluent/ discharge is generally poorer in quality/quantity than the original intake. This necessitates creation of treatment facilities, defining standards of effluent discharge, and foremost continuous monitoring of water quality of rivers and other water sources.

Since 1963, Central Water Commission has been involved in water quality monitoring. Central Water Commission has been monitoring the water quality at 788 (as on January, 2025) stations across various rivers and 90 water bodies (as on January, 2025) in India.

This report, now in its seventh edition, aims to provide insights into the water quality scenario based on standards set by the Ministry of Environment, Forest and Climate Change (MoEFCC), the Central Pollution Control Board (CPCB) and Bureau of Indian Standards (BIS). Previous editions were published in August 2011, November 2017, November 2021, August 2024 (2 nos.) and November 2024. This seventh edition is based on the seasonal average values (Pre-monsoon, Monsoon and Post-monsoon) observed during January-December, 2024 at monitoring stations across India. It is our earnest hope that the findings presented herein will serve as a useful resource for developing strategies and implementing effective remedial measures.

(Atul Jain)

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Water in its purest form on Earth, comes from rain and snow. This water is available first in the form of surface water through rivers and Lakes. Thus, we can say the journey of water on Earth starts in the shape of surface runoff. This surface water forms the lifeline of almost all the human activities as also most of nature's activities. It is the surface water which percolates down and recharges the aquifers and becomes part of Ground Water. Due to the fast pace of industrialization and urbanization, a lot of effluent and sewage is being generated, for a major portion of which there are no effluent treatments. This has resulted in discharge of this sewage into the rivers untreated or only partially treated. Rivers are our lifeline and we all have the responsibility of preserving it, to make our development and consequently quality of life sustainable. Pollution of rivers does not mean that they are polluted from its source to mouth, but there are stretches in some rivers which are polluted and actions are being taken by the Government to bring these stretches to acceptable conditions.

Central Water Commission has been monitoring the quality of river water at 788 stations on different rivers & 90 water bodies, all over India. It all started with the aim of monitoring the water quality parameters for agricultural purposes, but later on many more parameters were added and at present it covers more or less the entire spectrum of water quality. This is the Seventh Edition of Hot spots report and it is based on the seasonal average values observed during January-December, 2024 covering 768 WQ monitoring stations of CWC.

I would like to place on record my appreciation of Sh. Satish Jain, Deputy Director, RDC-II Dte; Sh. Altaf Hussain, Deputy Director, RDC-II Dte, Dr. Jakir Hussain, Research Officer, RDC-II Dte; Rajesh Kumar, Research Officer, RDC-II Dte; for excellently bringing out Seventh Edition of this publication. I also appreciate the sampling, testing and compilation work done by scientific officers of CWC.

(Anupam Prasad)

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Water is one of the most important and a basic natural resource on the Earth and it sustain lives of all organism of the Earth. Only 2.5% of surface water is fresh water. The rest is sea water and is undrinkable. Out of the 2.5%, over 1.75 % is locked as frozen form and thus remaining 0.75 % of all the water is available for human consumption. Central Water Commission, an apex engineering Organization under the Ministry of Water Resources, River Development and Ganga Rejuvenation is playing an active role not only for water resource development but also in field of water quality.

CWC is monitoring the water quality of rivers since 1960's. Its water quality network consists of 788 water quality stations (as on January, 2025) along with 90 water bodies and a 3-tier laboratory system of 465 Level-I, 19 Level-II and 5 Level-III laboratories across the country. Water quality monitoring in Indian rivers is gaining importance in present day context with increasing urbanization, rapid industrialization and rising standards of living. The present 7th edition of the Report "Water Quality Hot spots in Rivers of India" is based on the seasonal average values observed for 13 parameters (pH, Electrical Conductivity (EC), Fluoride (F^-), Ammonia as N (NH_3-N), Nitrate as N (NO_3-N), Chloride (Cl^-), Total Hardness (TH), Boron (B), Sodium Adsorption Ratio (SAR), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Total Coliform (TC) and Faecal Coliform (FC)) during January-December 2024 at monitoring stations across India. The report brings out the identified locations having concentration of these parameters above the acceptable limits.

I appreciate the hard work done by Sh. Rajat Sharma, Senior Research Assistant (Lead Author) of River Data Compilation-2 Directorate & my appreciation to all field Chief Engineers of CWC for collection and submission of water quality data to River Data Compilation-2 Directorate and thus paving way to publish such a useful report.

(Davendra Pratap Mathuria)

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Figures

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EXECUTIVE SUMMARY

The assessment of water quality is an essential measure within environmental monitoring. When water quality is poor, it affects not only the aquatic life but also the surrounding ecosystems. Rivers are unquestionably important parts of the hydrological cycle, mainly because they are fluxes of water and not reservoirs of water. Rivers, along with water, drag off sediments and other suspended materials (biotic and abiotic) that ultimately will reach all the other aquatic environments. The present study (7th Edition) is based on the data of 13 water quality parameters covering 768 water quality monitoring stations in 2024. The eight parameters — pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), total coliform bacteria (TC), free ammonia (NH_3-N), electrical conductivity (EC), boron (B), sodium adsorption ratio (SAR) are important for classification based on the uses defined by the Central Pollution Control Board (CPCB). Fluoride (F^-), Chloride (Cl^-), Total Hardness (TH) and Nitrate (NO_3^--N) are among the parameters defined by the Bureau of Indian Standards (BIS: 10500:2012) for drinking water. Faecal Coliform (FC) is based on the primary water quality criteria for bathing water listed in the Gazette Notification issued by the Ministry of Environment, Forest and Climate Change (MoEFCC) in 2000. These samples were analyzed at 23 water quality laboratories of CWC. The analysis results are compared with the prescribed limits of CPCB deginated best uses, BIS 10500:2012 and MoEFCC standards to find out the hot spot in Indian River in absence of any river specific standards. The parameter-wise summary of the analysis results is given below:

pH

The recommended acceptable pH limit for drinking water sources varies depending on the classification: Class A (without conventional treatment but after disinfection), Class B (outdoor bathing organized) and Class C (after conventional treatment and disinfection). In 2024, a total of 22,380 river water samples were analyzed with 906 samples (4.05%) found to exceed the acceptable pH limit. Thirty (30) water quality monitoring stations on 21 rivers exceeded the acceptable pH limit. The pH of the samples ranged from 3.95 to 11.4 throughout January to December 2024. The lowest pH value (3.95) was observed at the Kharkhana water quality monitoring station on the Myntdu River in March 2024. The highest pH value (11.4) was observed at the Patala water quality monitoring station on the Wardha River in September 2024.

Acceptable Limit of Designated Best Uses of Water by CPCB (Class A, B, D)	pH 6.5 – 8.5
No of Samples Tested	22380
No. of samples where pH value found beyond acceptable limit	906
No. of Monitoring stations where average (pre-monsoon/, monsoon / post monsoon) pH value found beyond acceptable limit	30
No. of rivers/basins where pH value found beyond acceptable limit	21/7

Electrical Conductivity (EC)

The recommended acceptable limit of electrical conductivity as 2250 µS/cm is mentioned in "Designated Best Uses of Water" by CPCB only in Class E- Irrigation, Industrial Cooling, and Controlled Waste Disposal. In 2024, a total of 22,380 river water samples were analyzed with 203 samples (0.91%) found to exceed the acceptable electrical conductivity limit. Eleven (11) water quality monitoring stations on 10 rivers exceeded the acceptable

Acceptable Limit of Designated Best Uses of Water by CPCB (Class E)	EC< 2250 µS/cm
No of Samples Tested	22380
No. of samples where electrical conductivity found above acceptable limit	203
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) electrical conductivity found above acceptable limit	11
No. of rivers/basins where EC value found beyond acceptable limit	10/6

electrical conductivity limit (CPCB Class E). The electrical conductivity range was from 8 to 16300µS/cm in 2024. The lowest electrical conductivity (8 µS/cm) was observed at the Jiabharali water quality monitoring station on the Jiabharali River during April 2024. The highest electrical conductivity (16300 µS/cm) was observed at the Luwara water quality monitoring station on the Shetrunji River during March 2024.

Ammonia as N (NH_3-N)

The recommended acceptable limit of ammonia as N (NH_3-N) as 1.2 mg/L is mentioned in "Designated Best Uses of Water" by CPCB only in Class D-Propagation of wild life and fisheries. In 2024, a total of 18781 river water samples were analyzed with 1038 samples (5.53%) found to exceed the acceptable limit. Fourty seven (47) water quality monitoring stations on 24 rivers exceeded the acceptable ammonia limit (CPCB Class D). The ammonia concentration of the samples ranged from 0.00 to 45.70 throughout January to December 2024. The highest ammonia concentration 45.70 mg/L was observed at KT (Satrapur) water quality monitoring station on the Kanhan River during April 2024.

Acceptable Limit of Designated Best Uses of Water by CPCB (Class D)	NH_3-N<1.2 mg/L
No of Samples Tested	18781
No. of samples where ammonia found above acceptable limit	1038
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) ammonia found above acceptable limit	47
No. of rivers/basins where ammonia value found beyond acceptable limit	24/12

Boron(B)

The recommended acceptable limit of boron as 2.0 mg/L is mentioned in "Designated Best Uses of Water" by CPCB only in Class E-Irrigation, Industrial Cooling, and Controlled Waste Disposal. In 2024, a total of 15,916 river water samples were analysed with 4 (0.03%) found exceed the acceptable limit (CPCB-Class E). The boron concentration of the samples ranged from 0.00 to 2.71 throughout January to December 2024. The highest boron concentration 2.71 mg/L was observed at Mangaon water quality monitoring station on the Kal River during September 2024.The average values of water quality monitoring stations during the pre-monsoon/monsoon/post-monsoon seasons of 2024 have been found to be within the acceptable limit for boron.

Acceptable Limit of Designated Best Uses of Water by CPCB (Class E)	B < 2.0 mg/L
No of Samples Tested	15916
No. of samples where ammonia found above acceptable limit	4
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) ammonia found above acceptable limit	0
No. of rivers/basins where Boron value found beyond acceptable limit	0

Fluoride (F^-)

Bureau of Indian Standard (10500:2012) has recommended the acceptable limit of 1.5 mg/ for fluoride. In 2024, a total of 19,043 river water samples were analyzed and 12 samples (0.06%) found to exceed the acceptable limit of BIS 10500:2012. One (01) water quality monitoring station on 01 river exceeded the acceptable fluoride limit of BIS 10500:2012. The fluoride concentration range was from 0.00 to 8.9 mg/L in 2024. The highest fluoride concentration (8.9 mg/L) was observed at the Lingdem Hot Spring water quality monitoring station on the Talang Chu River during February 2024.

Acceptable Limit as BIS 10500: 2012	F^- < 1.5 mg/L
No of Samples Tested	19043
No. of samples where fluoride found above acceptable limit	12
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) fluoride found above acceptable limit	1
No. of rivers/basins where fluoride value found beyond acceptable limit	1/1

Nitrate as N (NO_3^--N)

Acceptable Limit as BIS 10500: 2012	NO_3^- – N < 10.16 mg/L
No of Samples Tested	17373
No. of samples where nitrate found above acceptable limit	372
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) nitrate found above acceptable limit	22
No. of rivers/basins where nitrate value found beyond acceptable limit	21/4

Bureau of Indian Standard (10500:2012) has recommended that the acceptable limit for nitrate is 45 mg/L or 10.16 mg/L as NO_3^- – N in drinking water. In 2024, a total of 17,373 river water samples were analyzed and 372 samples (2.14%) found to exceed the acceptable limit. Twenty-two (22) water quality monitoring stations on 21 rivers exceeded the acceptable nitrate limit of BIS 10500:2012. The nitrate concentration range was from 0.00 to 108 mg/L in year 2024. The highest nitrate concentration (108 mg/L) was observed at the Cholachagudda water quality monitoring station on the Malaprabha River during July 2024.

Chloride (Cl^-)

Acceptable Limit as BIS 10500: 2012	Cl^- < 1000 mg/L
No of Samples Tested	21848
No. of samples where chloride found above acceptable limit	39
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) chloride found above acceptable limit	01
No. of rivers/basins where chloride value found beyond acceptable limit	1/1

BIS (Bureau of Indian Standard) 10500:2012) has recommended an acceptable limit of 1000 mg/L of chloride in drinking water. In 2024, a total of 21,848 river water samples were analyzed and 10 samples (0.05%) found to exceed the acceptable limit. One (01) water quality monitoring station on 01 river exceeded the acceptable chloride limit of BIS 10500:2012. The chloride concentration range was from 1 to 3594 mg/L in 2024.The highest chloride concentration (3594 mg/L) was observed at the Luwara water quality monitoring station on the Shetrunji River River during March 2024.

Total Hardness (TH)

Acceptable Limit as BIS 10500: 2012	TH < 600 mg/L
No of Samples Tested	21505
No. of samples where total hardness found above acceptable limit	56
No. of Monitorin stations where average (pre-monsoon/monsoon/post-monsoon) total hardness found above acceptable limit	04
No. of rivers/basins where pH value found beyond acceptable limit	4/4

BIS (Bureau of Indian Standard) 10500:2012) has recommended an acceptable limit of 600 mg/L of total hardness in drinking water. In 2024, a total of 21,505 river water samples were analyzed and 56 samples (0.26%) found to exceed the acceptable limit. Four (04) water quality monitoring stations on 04 rivers exceeded the acceptable total hardness limit of BIS 10500:2012. The total hardness concentration range was from 6 to 1118 mg/L in year 2024. The lowest hardness concentration (6 mg/L) was observed at the Hariharapura water quality monitoring station on the Tunga River during September 2024. The highest hardness concentration (1118 mg/L) was observed at the Dhansa water quality monitoring station on the Sahibi River during October, 2024.

Dissolved Oxygen (DO)

Acceptable Limit of Designated Best Uses of Water by CPCB (Class B)	DO > 5.0 mg/L
No of Samples Tested	20817
No. of samples where dissolved oxygen found above acceptable limit	3281
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) dissolved oxygen found above acceptable limit	156
No. of rivers/basins where pH value found beyond acceptable limit	86/13

The recommended acceptable limit of dissolved oxygen as < 5.0 mg/L is mentioned in "Designated Best Uses of Water" by CPCB only in Class B- outdoor bathing (organised). In 2024, a total of 20,817 river water samples were analyzed and 3281 samples (15.76%) found to exceed the acceptable limit. One hundred fifty-six (156) water quality monitoring stations on eighty-six (86) rivers exceeded the acceptable limit of dissolved oxygen (CPCB - Class B). The dissolved oxygen concentration range was from 0 to 14.4 mg/L in year 2024. The zero DO concentration was observed at 22 water quality stations on the 12 rivers across India during 2024.

Bio-chemical Oxygen Demand (BOD)

Acceptable Limit of Designated Best Uses of Water by CPCB (Class B)	BOD < 3.0 mg/L
No of Samples Tested	18457
No. of samples where BOD found above acceptable limit	3698
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) BOD found above acceptable limit	146
No. of rivers/basins where pH value found beyond acceptable limit	70/9

The recommended acceptable limit of biochemical oxygen demand as > 3.0 mg/L is mentioned in "Designated Best Uses of Water" by CPCB only in Class B- outdoor bathing (organised). In 2024, a total of 18,457 river water samples were analyzed and 3698 samples (20.04%) found to exceed the acceptable limit. One hundred forty-six (146) water quality monitoring stations on seventy (70) rivers exceeded the acceptable biochemical oxygen demand (CPCB-Class B). The BOD concentration range was from 0.00 to 140.94 mg/L in year 2024. The highest BOD concentration (140.94 mg/L) was observed at the Singasadanapalli water quality monitoring station on the Ponnaiyar River during December, 2024.

Total Coliform (TC)

Acceptable Limit of Designated Best Uses of Water by CPCB (Class B)	TC < 500 MPN/ 100ml
No of Samples Tested	7299
No. of samples where total coliform found above acceptable limit	6545
No. of Monitoring stations where average (pre-monsoon/monsoon/post-monsoon) total coliform found above acceptable limi	378
No. of rivers/basins where pH value found beyond acceptable limit	187/12

The recommended acceptable limit of total coliforms as > 500 MPN/100 ml is mentioned in "Designated Best Uses of Water" by CPCB only in Class B- outdoor bathing (organised). In 2024, a total of 7299 river water samples were analyzed and 6545 samples (89.7%) found to exceed the acceptable limit. Three hundred seventy-eight (378) water quality monitoring stations on one hundred eighty-seven (187) rivers exceeded the acceptable total coliform (CPCB-Class B). The total coliform concentration range was from 20 to 13,00,00,000 MPN/100 ml in year 2024. The highest total coliform level (13,00,00,000 MPN/100 ml) was observed at Mohna water quality monitoring station on the Yamuna River during March, 2024.

Faecal Coliform (FC)

Primary Water Quality Criteria for Bathing water (MoEF & CC) Gazette Notification, 2000	FC < 500 MPN/ 100ml
No of Samples Tested	7211
No. of samples where faecal coliform found above acceptable limit	5741
No. of Monitoring stations where faecal coliform found above acceptable limit	322
No. of rivers/basins where pH value found beyond acceptable limit	143/11

Primary Water Quality Criteria for Bathing water (MoEF & CC) Gazette Notification, 2000 recommended acceptable limit of faecal coliform as > 500 MPN/100 ml. In 2024, a total of 7211 river water samples were analyzed and 5741 samples (79.61%) found to exceed the acceptable limit. Three hundred twenty-two (322) water quality monitoring stations on one hundred forty-three (143) rivers exceeded the acceptable total coliform (CPCB-Class B). The faecal coliform concentration range was from 11 to 1,40,00,000 MPN/100ml in year 2024. The lowest faecal coliform value (11 MPN/100ml) was observed at the Akhnoor water quality monitoring station on the Chenab River during August, 2024. The highest faecal coliform value (1,40,00,000 MPN/100ml) was observed at the Noida water quality monitoring station on the Hindon during January, 2024.

Sodium Adsorption Ratio (SAR)

Acceptable Limit of Designated Best Uses of Water by CPCB (Class E)	SAR < 26
No of Samples Tested	19378
No. of samples where SAR found above acceptable limit	5
No. of Monitoring stations where SAR found above acceptable limit	0
No. of rivers/basins where pH value found beyond acceptable limit	0

The recommended acceptable limit of SAR as 26 is mentioned in "Designated Best Uses of Water" by CPCB only in Class E- Irrigation, Industrial Cooling, and Controlled Waste Disposal. In 2024, a total of 19,378 river water samples were analysed with 5 (0.04%) found exceeding the acceptable limit (CPCB-Class E). The SAR range was from 0 to 33.26 in year 2024. The highest SAR value (33.26) was observed at Luwara water quality monitoring station on the Shtrunji River during March, 2024. The average values of water quality monitoring stations during the pre-monsoon/monsoon/post-monsoon seasons of 2024 have been found to be within the acceptable limit for boron.

1.INTRODUCTION

1.1 Water Quality & its Importance

Water quality, in general, can be defined as the suitability of water to sustain various uses or processes. Any particular use will have specific requirements for the physical, chemical, or biological characteristics of water. The term is most frequently employed by reference to a set of standards against which compliance, generally achieved through water treatment, can be assessed. The most common standards used to monitor and assess water quality convey the health of ecosystems, the safety of human contact, the extent of water pollution, and the condition of drinking water. Water quality significantly impacts water supply and often determines supply options. The parameters for water quality are determined by the intended use. Work in the area of water quality tends to be focused on water that is treated for potability, industrial/domestic use, or restoration (of an environment/ecosystem, generally for the health of human/aquatic life).

The composition of surface and underground waters depends on natural factors (geological, topographical, meteorological, hydrological, and biological) in the drainage basin and varies with seasonal differences in runoff volumes, weather conditions and water levels. Large natural variations in water quality may, therefore, be observed even when only a single watercourse is involved. Human intervention also has significant effects on water quality. Some of these effects result from hydrological changes, such as the construction of dams, draining of wetlands, and diversion of flow. More obvious are the polluting activities, such as the discharge of domestic, industrial, urban, and other wastewaters into the watercourse (whether intentional or accidental) and the spreading of chemicals on agricultural land in the drainage basin. Water quality is influenced by a wide range of natural factors. The most important of these natural influences are geological, hydrological and climatic, as they affect the quantity and quality of water available.

The water quality of Indian rivers is of considerable importance, as these waters serve various purposes, including drinking for domestic and residential water supplies, agriculture (irrigation), hydroelectric power plants, tourism, recreation, and other human or economic uses of water.

The monitoring of river water quality is a crucial aspect of restoring water quality. One of the primary objectives of river water quality monitoring is to evaluate the suitability of river water for drinking purposes, irrigation, outdoor bathing and the propagation of wildlife and fisheries. The physical and chemical quality of river water plays a key role in determining its fitness

for drinking. Therefore, the suitability of river water for potable uses, particularly in terms of its chemical quality, must be assessed based on vital characteristics. The Bureau of Indian Standards (BIS), formerly known as the Indian Standard Institute (ISI), has outlined quality standards for drinking water in its document IS 10500:2012 serving as a reference for determining the suitability of river water.

Monitoring and assessing water quality are essential for comprehending the extent and magnitude of the water quality challenge. Unlike water quantity, monitoring water quality is a complex process. Managing the water quality of rivers is a challenging task, with various manmade and natural factors likely to increase complexity in the future. One significant reason is the introduction and use of numerous new chemicals each year in agriculture, chemical industries, pharmaceutical industries etc. The large quantity of these new chemicals, along with the difficulty in quantifying many of them due to certain limitations, makes it challenging to reliably assess the health and environmental consequences. This complexity is further compounded by the continuous introduction of new chemicals, making it difficult to predict the long-term impact on water quality and associated ecosystems.

1.2 Water Quality Hot Spots

As per the Guidelines for Water Quality Monitoring, 2017, a 'Hotspot' is defined as a location or monitoring station where the concentration of a particular parameter exceeds the permissible limits prescribed by the water quality standards in the BIS code IS 10500:2012. In this report, a 'Hotspot' is determined based on the location or Monitoring station where the concentration of a specific parameter surpasses the permissible limits set by the drinking water quality standards in the BIS code IS 10500:2012, 'Designated Best Use Water Quality Criteria' established by the Central Pollution Control Board (CPCB) and Primary Water Quality Criteria for Bathing Water mentioned in the Ministry of Environment, Forest and Climate Change (MoEFCC) Gazette Notification, 2000. The report incorporates data covering 768 water quality monitoring stations in year 2024 of the Central Water Commission (CWC), covering significant rivers in India.

It is based on the average values observed during Pre-monsoon (January to May), Monsoon (June to October) and Post-monsoon (November to December) seasons for the year 2024. River water quality has been evaluated based on 13 parameters: pH, Electrical Conductivity (EC), Fluoride (F^-), Ammonia as N (NH_3-N), Nitrate as N (NO_3^-N), Chloride (Cl^-), Total Hardness (TH), Boron (B), Sodium Adsorption Ratio (SAR), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Total Coliform (TC) and Faecal Coliform (FC). These parameters are crucial in defining the quality of surface

water in rivers. Therefore, the presence of these parameters in river water beyond the permissible limits is considered as river water quality hotspots.

2.INDIAN WATER RESOURCES SCENARIO

2.1 River Basins of India

India-WRIS under its publication "River Basin Atlas of India", October 2012 has standardized the river basins of India. The country is classified into 25 river basins and 101 sub-basins under India-WRIS project based on digital elevation model.

These 25 basins are:

(1) Indus (Up to Border) Basin.

(2a) Ganga; (2b) Brahmaputra; (2c) Barak and Others Basin.

(3) Godavari Basin.

(4) Krishna Basin.

(5) Cauvery Basin.

(6) Subarnarekha Basin.

(7) Brahmani and Baitarni Basin.

(8) Mahanadi Basin.

(9) Pennar Basin.

(10) Mahi Basin.

(11) Sabarmati Basin.

(12) Narmada Basin.

(13) Tapi Basin.

(14) West flowing rivers South of Tapi Basin.

(15) East flowing rivers between Mahanadi and Godavari Basin.

(16) East flowing rivers between Godavari and Krishna Basin.

(17) East flowing rivers between Krishna and Pennar Basin.

(18) East flowing rivers between Pennar and Cauvery Basin.

(19) East flowing rivers South of Cauvery Basin.

(20) West flowing rivers of Kutch and Saurashtra including Luni Basin.

(21) Minor rivers draining into Bangladesh Basin.

(22) Minor rivers draining into Myanmar Basin.

(23) Area of North Ladakh not draining into Indus Basin.

(24) Drainage area of Andaman & Nicobar Islands.

(25) Drainage area of Lakshdweep Islands.

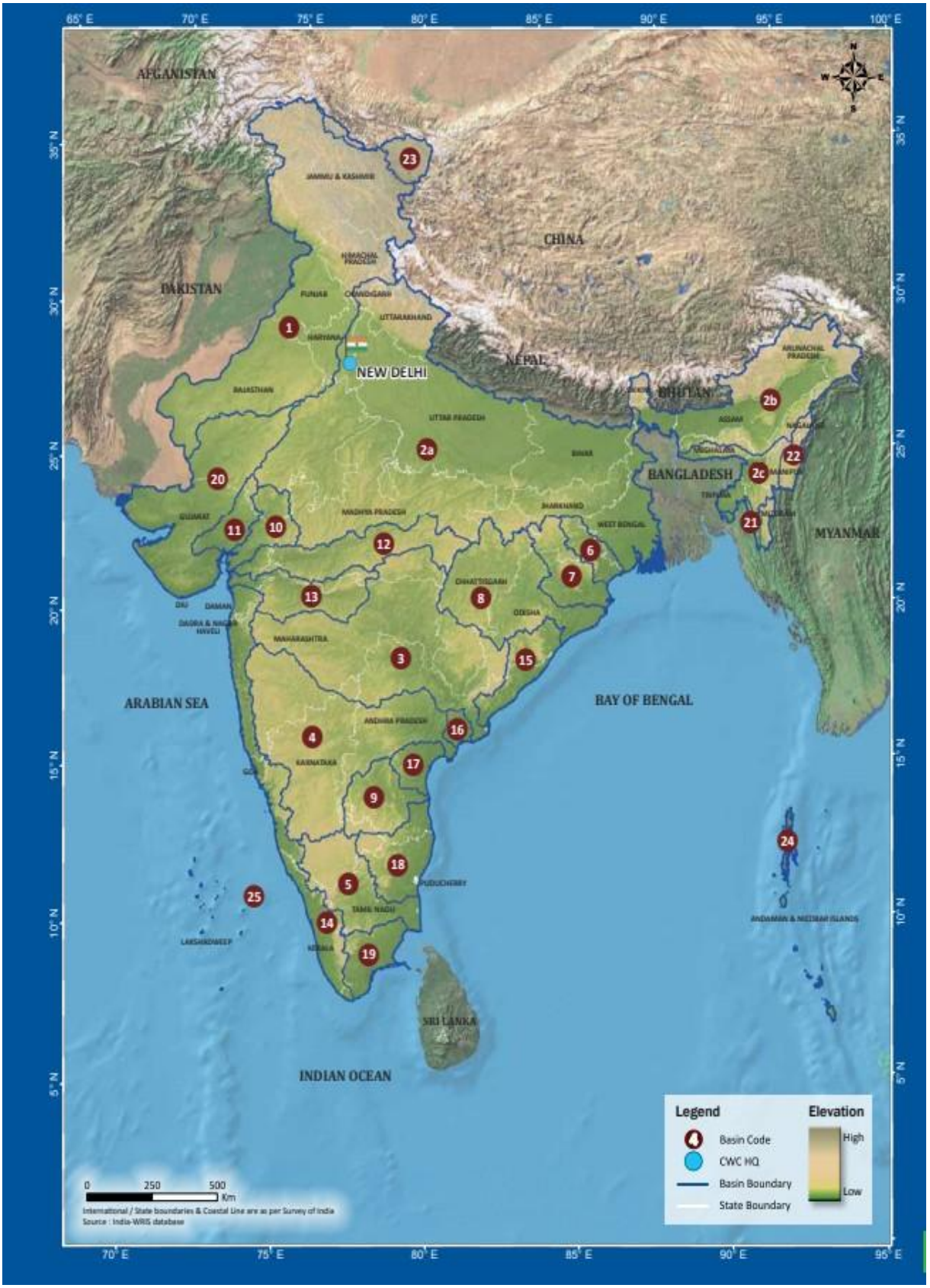


Fig 1- Indian River Basins

2.2 Indian River System

The Indian River Systems can be divided into four categories:- the Himalayan, the Rivers traversing the Deccan Plateau, the Coastal and those in the inland drainage basin .

The Himalayan Rivers are perennial as they are fed by melting glaciers every summer. During the monsoon, these Rivers assume alarming proportions. Swollen with rainwater, they often inundate villages and towns in their path. The Gangetic basin is the largest River system in India, draining almost a quarter of the country.

The Rivers of the Indian peninsular plateau are mainly fed by rain. During summer, their flow is greatly reduced, and some of the tributaries even dry up, only to be revived in the monsoon. The Godavari basin in the peninsula is the largest in the country, spanning an area of almost one-tenth of the country. The Rivers Narmada and Tapi flow almost parallel to each other but empty themselves in opposite directions. The two Rivers make the valley rich in alluvial soil and teak forests cover much of the land. While coastal River's gush down the peaks of the Western Ghats into the Arabian Sea in torrents during the rains, their flow slow down after the monsoon. Streams like the Sambhar in western Rajasthan are mainly seasonal in character, draining into the inland basins and salt lakes. In the Rann of Kutch, the only River that flows through the salt desert is the Luni.

2.2.1 Indus system

This comprises the river Indus and its tributaries like the Jhelum, Chenab, Ravi, Beas and Sutlej. These originate in the North and generally flow in a West or South-West direction to eventually flow into Arabian Sea through Pakistan.

2.2.2 Ganga-Brahmaputra-Meghna system

The main river Ganga and its tributaries like the Yamuna, Sone, Gandak, Kosi and many others; similarly, main rivers Brahmaputra, Meghna and their tributaries. All these eventually flow into Bay of Bengal, through Bangladesh. Some of the tributaries of these rivers are larger than other independent rivers. e.g. Yamuna, a tributary of Ganga, has a larger catchment area than the Tapi, a small peninsula river.

2.2.3 Rivers of Rajasthan and Gujarat

Mahi, Sabarmati, Luni etc. These are rivers of arid regions, they carry relatively little flow, some of them flow to Arabian Sea through Gujarat while some are land-locked and their flow is lost through percolation and evaporation in the vast arid regions.

2.2.4 East Flowing Peninsular Rivers

The important members of this group are: Damodar, Mahanadi, Brahmani, Baitarani, Subarnarekha, Krishna, Godavari and Cauvery. They all flow into Bay of Bengal at various places along the Eastern Coast of India.

2.2.5 West Flowing Peninsular Rivers

Narmada and Tapi rivers originate in Central India and flow in a western direction to meet Arabian Sea south of Gujarat.

2.2.6 Western Coast Rivers

There are large number of rivers in the Western Coast - i.e. coastal Maharashtra and Karnataka, and entire Kerala. These rivers are small in length but carry a significant amount of water due to very high rainfall in Western Ghats. They drain only 3% of the India's land area but carry 11% of India's water resources.

Sources:

1. River Basin Atlas of India, October 2012- Jointly developed by CWC and ISRO.
2. India Water Resources Information System.

*The more details may be assessed by clicking the links given below: (*https://indiawris.gov.in/downloads/RiverBasinAtlas_Full.pdf*)*

3. HYDROCHEMISTRY

Hydrochemistry is an interdisciplinary science that deals with the chemistry of water in the natural environment. Professional fields such as chemical hydrology, aqueous chemistry, hydrochemistry, water chemistry and hydro-geochemistry are all more or less synonyms. The classical use of chemical characteristics in chemical hydrology is to provide information about the regional distribution of water qualities.

Main areas of work are the chemical characterization of the water (which is highly dependent on the regional and geochemical event units), the determination of water-chemical parameters and the assessment of anthropogenic and other influences on the water quality.

At the same time, hydrochemistry can also be of immense help in yielding information about the environment through which water has circulated. It is essential to study the entire system like atmospheric water (rainwater), surface water and ground water simultaneously in evaluating their hydrochemistry and pollution effect.

3.1 Chemistry of Rainwater

The atmosphere is composed of water vapors, dust particles and various gaseous components such as N_2, O_2, CO_2, CH_4, CO, SO_2, NO_2 etc. Pollutants in the atmosphere can be transported through long distances by the wind. These pollutants are mostly washed down by precipitation and partly as dry fall out. Composition of rainwater is determined by the source of water vapors and by the ion, which are taken up during transport through the atmosphere. In general, chemical composition of rainwater shows that rainwater is slightly mineralized with specific electrical conductance (EC) generally below 50 µS/cm, chloride (Cl^-) below 5 mg/l and HCO_3 below 10 mg/l. Among the cations, concentration of Ca, Mg, Na & K vary considerably but the total cations content is generally below 15 mg/l except in samples contaminated with dust. The concentration of sulphates and nitrates in rainwater may be high in areas near industrial hubs.

3.2 Chemistry of Surface Water

Surface water is found extremely variable in its chemical composition due to variations in relative contributions of ground water and surface water sources. The possible causes and consequences of changes in climate, land use and industrial, urban and agricultural pollution can be expected to be indicated by changes in the physical and chemical composition of water in rivers and streams. The mineral content in river water usually bears an inverse relationship to discharge. 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. Among anions, bicarbonates are the most important and constitute over 50% of the total anions in terms of milli equivalent per litre (meq/l). In case of cations, alkaline earths or normally calcium predominates but with increasing salinity the hydro chemical facies tend to change to mixed cations or even to Na- HCO_3 type.

3.3 Chemistry of Ground Water

The downward percolating water is not inactive, and it is enriched in CO_2. It can also act as a strong weathering agent apart from general solution effect. Consequently, the chemical composition of ground water will vary depending upon several factors like frequency of rain, which will leach out the salts, time of stay of rain water in the root-zone and intermediate zone, presence of organic matter etc. It may also be pointed out that the water front does not move in a uniform manner as the soil strata are generally quite heterogeneous. The movement of percolating water through larger pores is much more rapid than through the finer pores. The overall effect of all these factors is that the composition of ground water varies from time to time and from place to place.

Before reaching the saturated zone, percolating water is charged with oxygen and carbon dioxide and is most aggressive in the initial stages. This water gradually loses its aggressiveness, as free CO_2 associated with the percolating water gets gradually exhausted through interaction of water with minerals.

The oxygen present in this water is used for the oxidation of organic matter that subsequently generates CO_2 to form H_2CO_3. This process goes on until oxygen is fully consumed.

Apart from these reactions, there are several other reactions including microbiological mediated reactions, which tend to alter the chemical composition of the percolating water. For example, the bicarbonate present in most waters is derived mostly from CO_2 that has been extracted from the air and liberated in the soil through biochemical activity.

Some rocks serve as sources of chloride and sulphate through direct solution. The circulation of sulphur, however, may be greatly influenced by biologically mediated oxidation and reduction reactions. Chloride circulation may be a significant factor influencing the anion content in natural water.

4. RIVER WATER POLLUTION

The World Health Organisation (WHO) says that polluted water is water whose composition has been changed to the extent that it is unusable. In other words, it is toxic water that cannot be drunk or used for essential purposes like agriculture and which also causes diseases like diarrhoea, cholera, dysentery, typhoid and many more.

River Water pollution occurs when pollutants are discharged directly or indirectly into rivers without adequate treatment of harmful compounds. River Water pollution affects humans, plants and organisms living in these rivers. Water pollutants are damaging not only the individual species and populations, but also the natural biological communities. Moving water dilutes and decomposes pollutants more rapidly than standing water.

The primary reasons for river water pollution are because of three major sources of pollution i.e. industry, agriculture and domestic situated along the rivers. Industries and cities have been located along rivers historically, because rivers provide transportation and have traditionally been a convenient place to discharge waste. Agricultural activities have tended to be concentrated near rivers, because river floodplains are exceptionally fertile due to the many nutrients that are deposited in the soil when the river overflows.

4.1 Sources of Pollution

4.1.1. Point source pollution

Point source pollution refers to the pollution entering the water way through a discrete conveyance like pipes, channels etc., from source such as industry.

4.1.2 Non- point source pollution

Non-point source pollution refers to the pollution that does not enter the water way through a discrete source but accumulative in nature. The pollutants are collected in small amounts from over a large area. These pollutants are:

- Natural contaminants such as dry leaves, dead insects and animals, bird droppings etc.
- Agricultural contaminants such as agricultural runoff containing fertilizers, pesticides etc. The fertilizers and pesticides can be washed through the soil by rain, to end up in rivers.

- Industrial contaminants such as industrial runoff containing industrial wastes.
- Microbial contaminants such as faecal & total coliform.
- Human added contaminants such as organic matter through domestic discharges.

If large amounts of fertilizers or farm waste drain into a river the concentration of nitrate and phosphate in the water increases considerably. Algae use these substances to grow and multiply rapidly turning the water green. This massive growth of algae, called eutrophication, leads to pollution. When the algae die they are broken down by the action of the bacteria which quickly multiply, using up all the oxygen in the water which leads to the death of many animals.

Chemical waste products from industries are discharged in to rivers. Such pollutants include cyanide, zinc, lead, copper, cadmium and mercury. These substances may enter the water in such high concentrations that fish and other animals are killed immediately. Sometimes the pollutants enter a food chain and accumulate until they reach toxic levels, eventually killing birds, fish and mammals.

Factories use water from rivers to power machinery or to cool down machinery. Dirty water containing chemicals is put back in to the rivers. Water used for cooling is warmer than the river itself. Raising the temperature of the water, lowers the level of dissolved oxygen and upsets the balance of life in the water. People sometimes carelessly throw rubbish directly into rivers.

4.2 Effects of Environmental factors on River water quality

River water quality is highly variable by nature due to environmental conditions such as basin lithology, vegetation and climate. In small watersheds spatial variations extend over orders of magnitude for most major elements and nutrients, while this variability is an order of magnitude lower for major basins. Standard river water for use as reference is therefore not applicable. As a consequence, natural waters can possibly be unfit for various human uses, even including drinking.

There are three major natural sources of dissolved and soluble matter carried by rivers: the atmospheric inputs of material, the degradation of terrestrial organic matter and the weathering of surface rocks. These substances generally transit through soil and porous rocks and finally reach the rivers. On their way, they are affected by numerous processes such as recycling in terrestrial biota, recycling and storage in soils, exchange between dissolved and particulate matter, loss of volatile substances to the

atmosphere, production and degradation of aquatic plants within rivers and lakes etc. As a result of these multiple sources and pathways, the concentrations of elements and compounds found in rivers depend on physical factors (climate, relief), chemical factors (solubility of minerals) and biological factors (uptake by vegetation, degradation by bacteria). The most important environmental factors controlling river chemistry are:

- Occurrence of highly soluble (halite, gypsum) or easily weathered (calcite, dolomite, pyrite, olivine) minerals.
- Distance to the marine environment which controls the exponential decrease of ocean aerosols input to land (Na^+, CI^-, SO_4^{2-}, and Mg^{2+}).
- Aridity (precipitation/runoff ratio) which determines the concentration of dissolved substances resulting from the two previous processes.
- Terrestrial primary productivity which governs the release of nutrients (C, N, Si, K).
- Ambient temperature which controls, together with biological soil activity, the weathering reaction kinetics.

5. WATER QUALITY MONITORING BY CWC

Central Water Commission (CWC) is playing an important role in the field of water quality monitoring of river water and is observing water quality at various rivers since 1960's. As on January, 2025, CWC is observing water quality at 788 key locations in different rivers across the country: 678 on Hydrological Observation network and 110 Water Quality Sampling stations (WQSS). In addition, CWC has started monitoring of water quality of water bodies across India since 01.03.2023. Till date, 90 water bodies have been identified for water quality monitoring purpose across various states of the country (Figure 2).

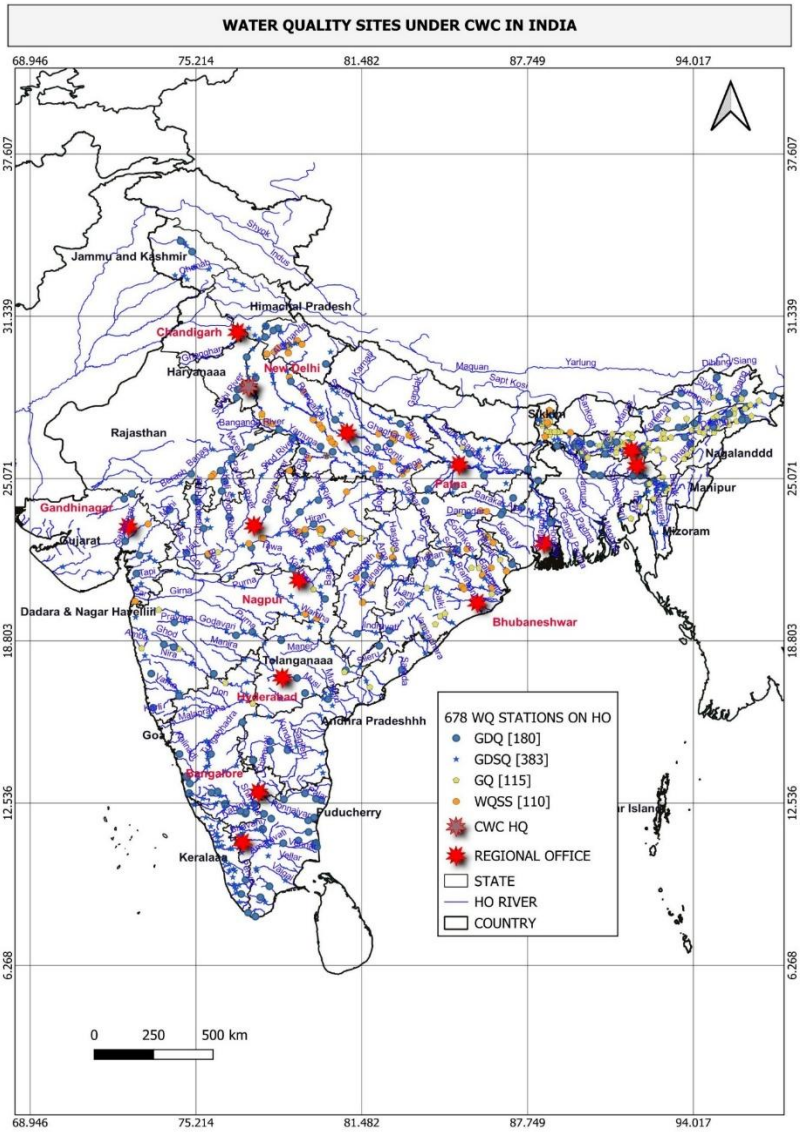


Figure 2: Water quality network of CWC

The details of distribution of WQ monitoring stations among different states and organisations/basins of CWC are given in the tables and figures given below.

Table 1: State–wise distribution of Water Quality Monitoring stations of CWC

S.No.	Name of State	GDQ	GDSQ	GQ	WQSS	Water Bodies	Grand Total
1	Andhra Pradesh	5	14	2	-	7	28
2	Arunachal Pradesh	11	9	10	-	3	32
3	Assam	20	26	54	-	11	111
4	Bihar	6	22	1	-	2	31
5	Chhattisgarh	3	18	2	9	4	36
6	Delhi	1	2	-	3	3	9
7	Gujarat	4	9	-	2	6	21
8	Haryana	3	1	-	-	-	4
9	Himachal Pradesh	-	6	-	-	1	7
10	Jammu & Kashmir	2	7	-	-	2	11
11	Jharkhand	6	6	1	7	2	22
12	Karnataka	15	25	2	-	4	46
13	Kerala	2	24	-	-	3	29
14	Madhya Pradesh	18	26	4	12	2	62
15	Maharashtra	12	30	4	6	10	62
16	Manipur	-	-	1	-	-	1
17	Meghalaya	5	3	1	-	2	11
18	Mizoram	-	5	-	-	-	5
19	Odisha	5	22	9	14	4	54
20	Puducherry	3	-	-	-	-	3
21	Rajasthan	8	8	-	2	1	19
22	Sikkim	-	11	5	6	1	23
23	Tamil Nadu	21	21	-	-	5	47
24	Telangana	4	8	1	-	4	17
25	Tripura		3	2	-	1	5
26	Uttar Pradesh	13	48	4	30	6	101
27	Uttrakhand	5	8	1	15	3	32
28	West Bengal	8	21	11	4	3	47
	Grand Total	**788**				**90**	**878**

Figure 3: State-wise distribution of Water Quality Monitoring stations monitored by CWC

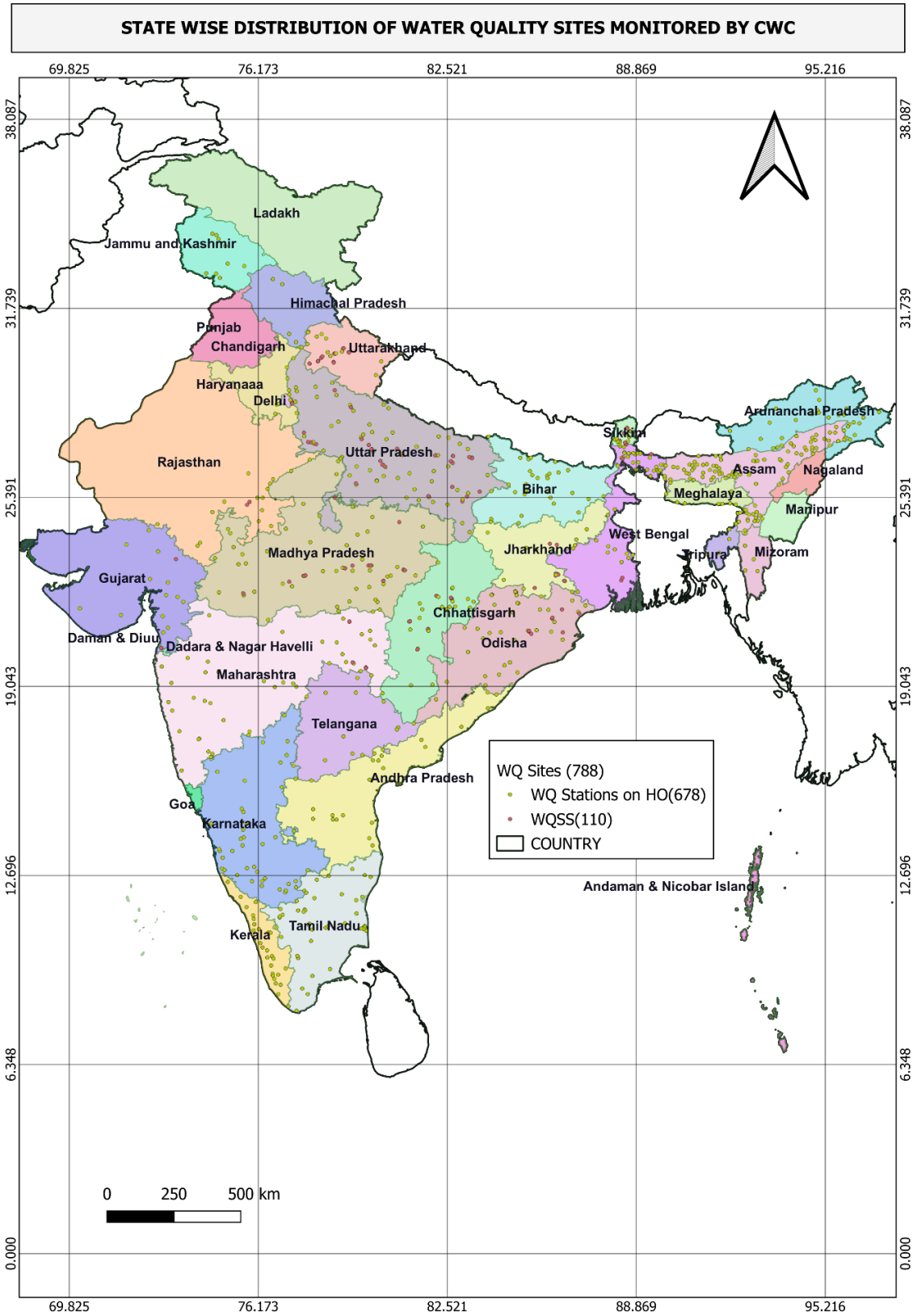


Table 2: Organisation–wise distribution of Water Quality Monitoring stations of CWC

S.No.	Organization	GDQ	GDSQ	GQ	WQSS	Water Bodies	Grand Total
1	Barak and Other Basins Organization, Shillong	7	22	8	-	4	40
2	Brahmaputra Basin Organization, Guwahati	28	24	59	-	13	123
3	Cauvery and Southern Rivers Organization, Coimbatore	35	53	-	-	11	99
4	Indus Basin Organization, Chandigarh	2	9	-	-	3	14
5	Krishna & Godavari Basin Organization, Hyderabad	18	35	7	-	15	75
6	Lower Ganga Basin Organization, Patna	9	33	1	6	5	54
7	Monitoring Central Organization, Nagpur	4	20	1	6	5	36
8	Mahanadi & Eastern Rivers Organization, Bhubaneswar	7	43	12	28	7	97
9	Monitoring South Organization, Bengaluru	9	19	-	-	3	31
10	Mahi & Tapi Basin Organization, Gandhinagar	6	15	-	2	6	29
11	Narmada Basin Organization, Bhopal	8	9	4	11	1	33
12	Teesta & Bhagirathi Damodar Basin Organization, Kolkata	14	32	18	12	6	82
13	Upper Ganga Basin Organization, Lucknow	6	31	2	33	5	77
14	Yamuna Basin Organization, New Delhi	27	38	3	12	6	86
	Grand Total	**788**				**90**	**878**

Figure 4: Organisation-wise distribution of water quality Monitoring stations monitored by CWC.

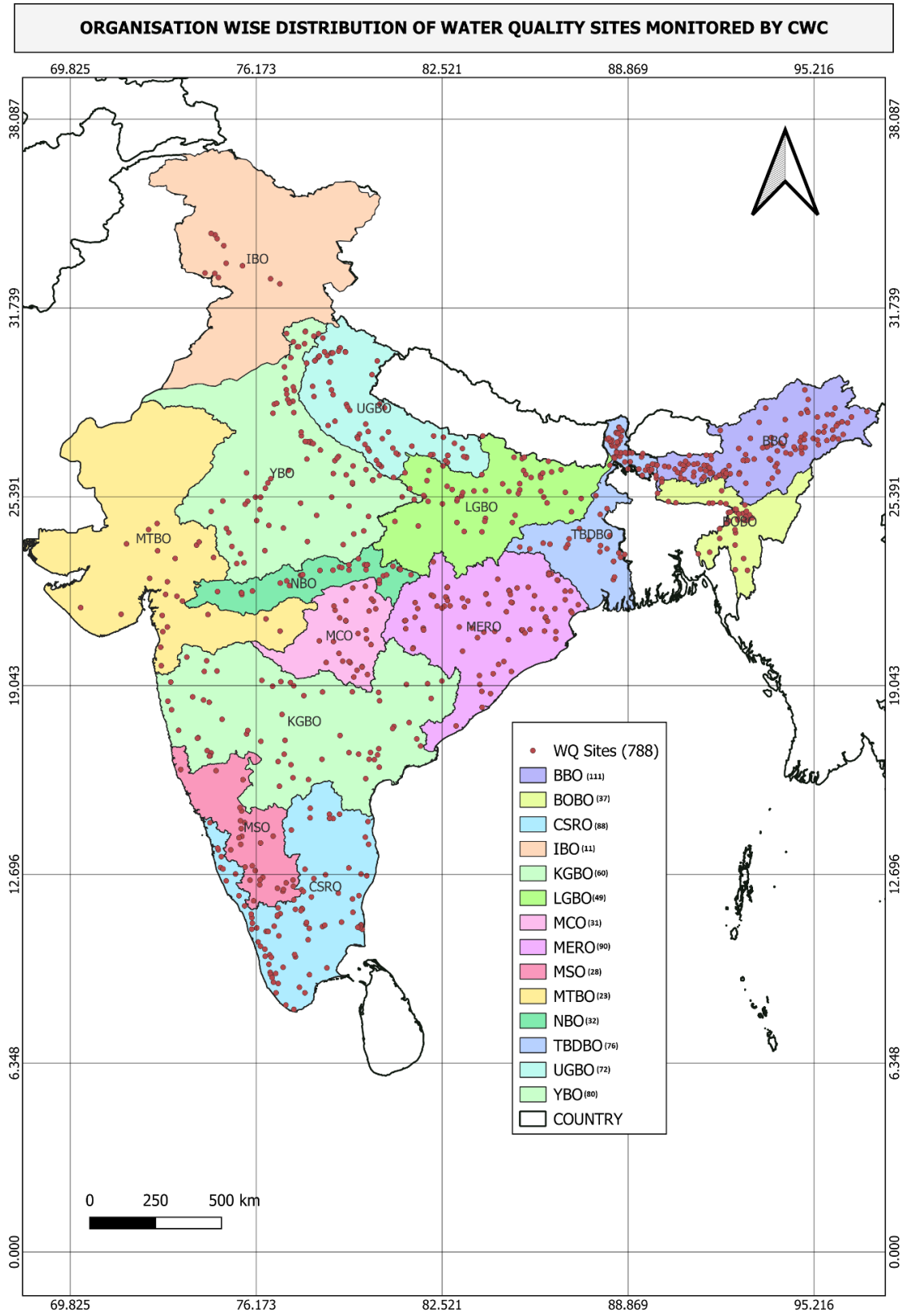
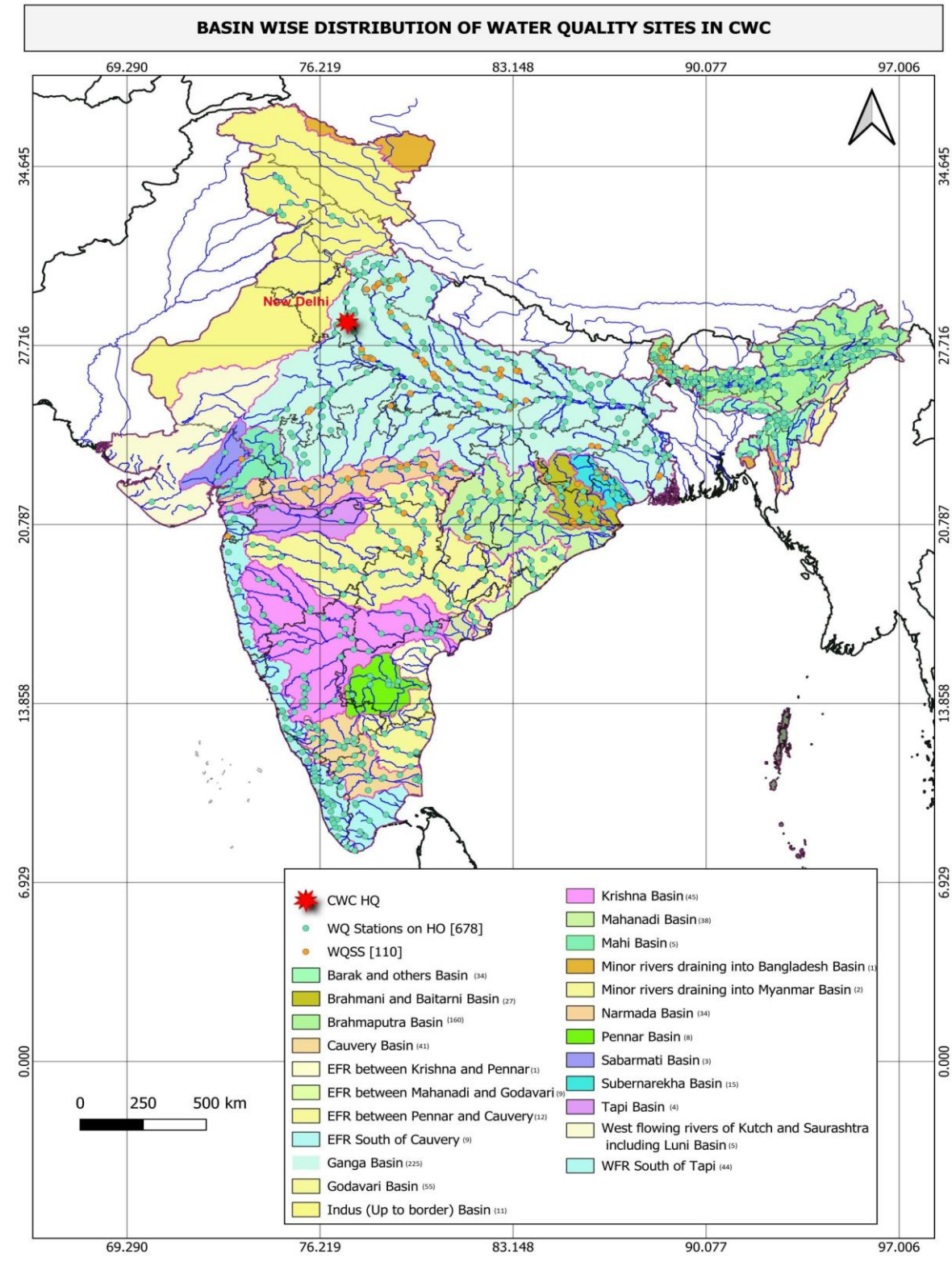


Table 3: Basin-wise water-quality Monitoring stations monitored by CWC

S.No.	Basins	GDQ	GDSQ	GQ	WQSS	Water Bodies	Grand Total
1	Barak & Other Basin	7	19	8	-	2	35
2	Brahmani & Baitarni Basin	1	11	3	12	1	28
3	Brahmaputra Basin	34	43	76	7	18	177
4	Cauvery Basin	20	22	-	-	3	45
5	EFR b/w Pennar and Cauvery	7	5	-	-	5	17
6	EFR Between Krishna & Pennar	-	1	-	-	-	1
7	EFR Between Mahanadi & Godavari	1	3	5	-	1	10
8	EFR South of Cauvery Basin	2	4	-	-	-	6
9	Ganga Basin	50	115	7	56	19	247
10	Godavari Basin	12	33	4	6	14	69
11	Indus Basin	2	9	-	-	3	14
12	Krishna Basin	10	31	3	-	6	50
13	Mahanadi Basin	3	22	3	10	4	42
14	Mahi Basin	2	3	-	-	-	5
15	Narmada Basin	8	11	4	11	3	37
16	Pennar Basin	4	4	-	-	2	10
17	Rivers Draining into Bangladesh Basin	-	1	-	-	-	1
18	Rivers Draining into Myanmar Basin	-	2	-	-	-	2
19	Sabarmati Basin	1	1	-	1	2	5
20	Subarnarekha Basin	2	6	1	6	1	16
21	Tapi Basin	1	3	-	-	2	6
22	WFR of Kutch & Saurashtra including Luni Basin	2	3	-	-	-	5
23	WFR South of Tapi Basin	11	31	1	1	4	48
	Grand Total	**788**				**90**	**878**

Figure 5: Map showing the basin-wise distribution of water quality Monitoring stations monitored by CWC.



The water quality samples collected at these monitoring stations are analysed at laboratories of CWC. At present, CWC follows a three-tier laboratory system which consists of Level I, II and III types of laboratories for providing analytical facilities for the analysis of river water samples collected from water quality monitoring stations covering all the important river basins of India.

The three-tier laboratory system consists of:

1. **Level-I Laboratories:** 465 level-I laboratories located at field water quality monitoring monitoring stations on various rivers of India for monitoring of 6 in-situ parameters: Colour, Odour, Temperature pH, Electrical Conductivity and Dissolved Oxygen (a map showing 465 Level-I labs can be seen at figure-6).
2. **Level-II Laboratories:** 19 level-II laboratories located at division offices to analyse 25 physico-chemical and bacteriological parameters of river water.
3. **Level-III Laboratories:** 5 regional labs located at New Delhi, Varanasi, Hyderabad, Coimbatore and Guwahati for analysis of 41 parameters including trace & toxic metals and pesticides.

   Out of 24 level-II/III laboratories of CWC, 22 laboratories of CWC have got accreditation by National Accreditation Board for Testing and Calibration Laboratories (NABL) in the field of testing in accordance with Standard ISO/IEC 17025:2017. A map showing level-II/III labs can be seen at figure-7. The details of monitoring parameters in each level labs are depicted in table-4.

Table 4: List of Water Quality Parameters monitored by CWC

Sl.No.	Level-I (465 Labs)	Level-II (19 Labs)	Level-III (05 Labs)
1	Temperature	Temperature	Temperature
2	Colour and Intensity	pH	pH
3	Odour	Electrical Conductivity	Electrical Conductivity
4	pH	Dissolved Oxygen (DO)	Dissolved Oxygen (DO)
5	Electrical Conductivity	Turbidity	Turbidity
6	Dissolved Oxygen	Biochemical Oxygen Demand (BOD)	Biochemical Oxygen Demand (BOD)
7	Weather	Chemical Oxygen Demand (COD)	Chemical Oxygen Demand (COD)
8	Depth of main stream/depth of water table	Total Dissolved Solids (TDS)	Total Dissolved Solids (TDS)
9	Visible effluent discharge	Sodium	Sodium
10	Human activities Around station	Calcium	Calcium
11	Station details	Magnesium	Magnesium
12	Velocity	Potassium	Potassium
13	Discharge	Phenolphthalein Alkalinity (Carbonate)	Phenolphthalein Alkalinity (Carbonate)
14	Water Level	Total Alkalinity	Total Alkalinity
15		Chloride	Chloride
16		Sulphate	Sulphate
17		Fluoride	Fluoride
18		Boron	Boron
19		Ammoniacal Nitrogen	Ammoniacal Nitrogen
20		Nitrate	Nitrate
21		Nitrite	Nitrite
22		Phosphate	Phosphate
23		Silicate	Silicate
24		Total Coliform MPN/100 ml	Total Coliform MPN/100 ml
25		Fecal Coliform MPN/100 ml	Fecal Coliform MPN/100 ml
26		E. Coli	E. Coli
27		Faecal Streptococci	Faecal Streptococci
28		Hardness	Hardness
29		NO2+NO3	NO2+NO3
30		Sodium Adsorption Ratio	Sodium Adsorption Ratio
31		% Sodium	% Sodium
32		Residual Sodium Carbonate	Residual Sodium Carbonate
33			Arsenic
34			Cadmium
35			Chromium
36			Copper
37			Iron
38			Lead
39			Nickel
40			Mercury
41			Zinc
42			Alpha BHC
43			Beta BHC
44			Gama BHC (Lindane)
45			OP DDT
46			PP-DDT
47			Alpha Endosulphan
48			Beta Endosulphan
49			Aldrin
50			Dieldrin
51			Carbaryl (Carbamate)
52			Malathion
53			Methyl Parathion
54			Anilophos
55			Chloropyriphos
56			2-4 D

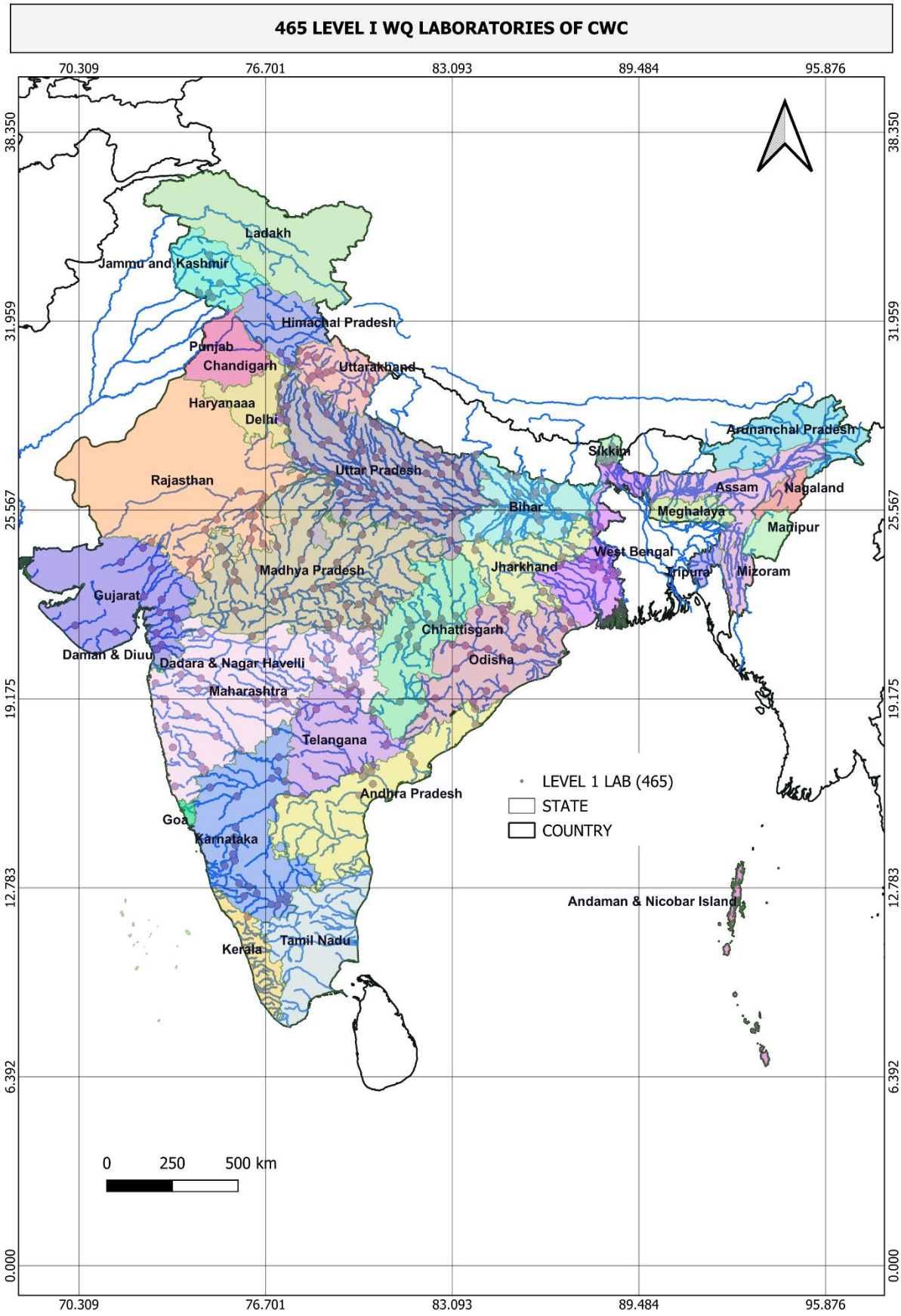


Figure 6: Level-I Water quality laboratories of CWC

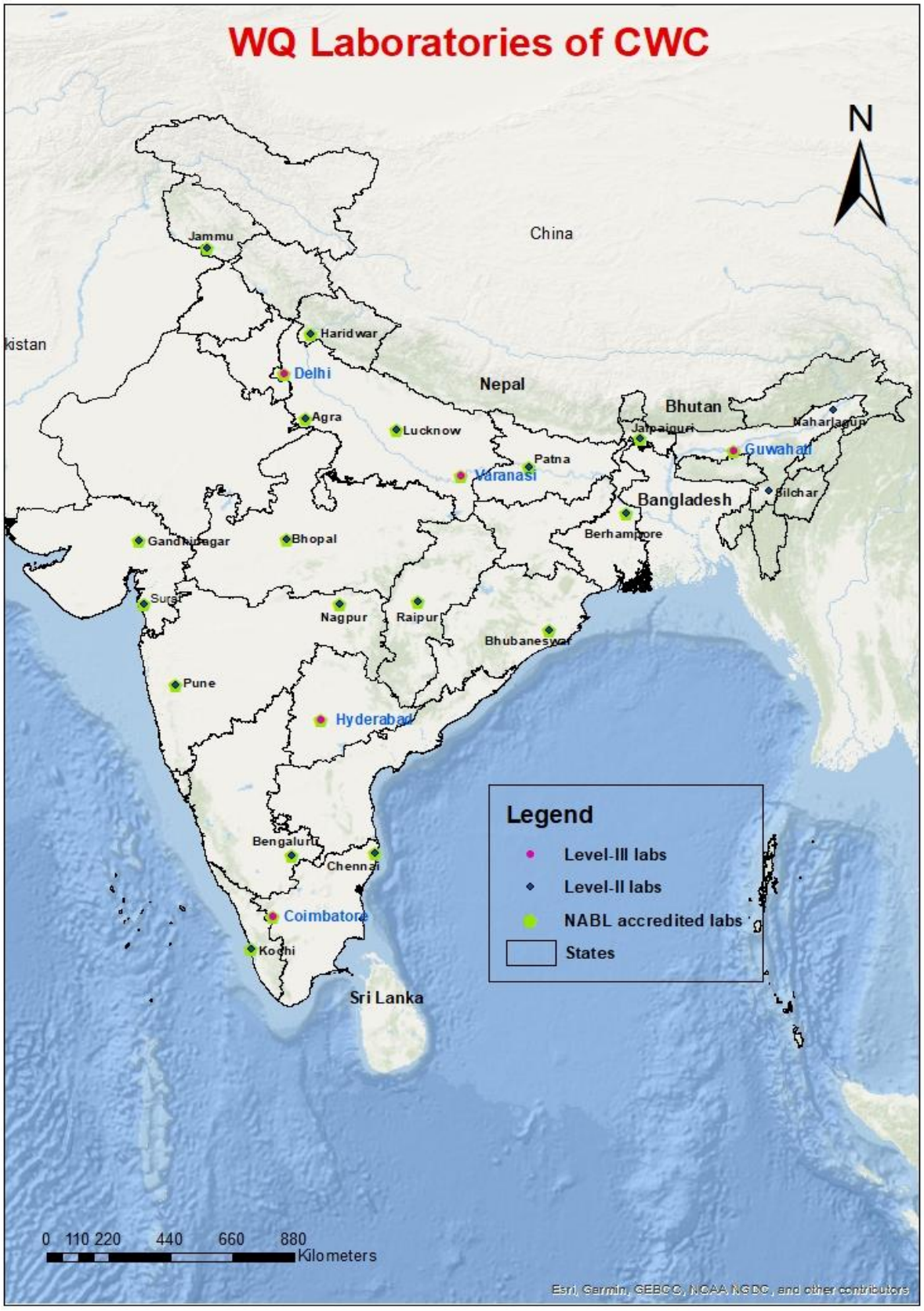


Figure 7: Level-II/III Water quality laboratories of CWC

6.1 River Water Quality Hot Spots in India

The river water quality monitoring is most essential aspect of restoring the water quality. One of the main objectives of the river water quality monitoring is to assess the suitability of river water for drinking purposes, irrigation, outdoor bathing and propagation of wildlife, fisheries. The physical and chemical quality of river water is important in deciding its suitability as a source of drinking water after treatment/bathing etc. As such the suitability of river water for potable uses with regard to its chemical quality has to be deciphered and defined on the basis of some vital characteristics of the water. River water quality is very important for aspect in India. The physico-chemical parameters like pH, Electrical Conductivity (EC), Fluoride (F^-), Ammonia as N (NH_3-N), Nitrate as N (NO_3^--N), Chloride (Cl^-), Total Hardness (TH), Boron (B), Sodium Adsorption Ratio (SAR), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Total Coliform (TC) and Faecal Coliform (FC) are important constituents defining the quality of river water in surface water. Therefore, presence of these parameters in river water beyond the value for permissible limit has been considered as river water quality hot spots. The best use classification is essential, for maintaining the quality of river water of the particular stretch. The study is based on average values of 13 parameters observed during Pre-monsoon (January to May), Monsoon (June to October) and Post-monsoon (November to December) seasons for the year 2024.

In this study identification of hot spot in Indian river wrt pH, Electrical Conductivity (EC), Ammonia as N (NH_3-N), Boron (B), Sodium Adsorption Ratio (SAR), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD) and Total Coliform (TC) parameters are done based on Class B, D & E of Designated best uses of water by Central Pollution Control Board (CPCB) (Table.4). In addition to above parameters, hotspots identification in Indian River w.r.t. Fluoride (F^-), Nitrate as N (NO_3^--N) , Chloride (Cl^-), Total Hardness (TH) parameters are done based on BIS (Bureau of Indian Standards) IS 10500: 2012 (Table.5) for drinking water as a benchmark in absence of any standard for these parameters for drinking waters.Faecal Coliform (FC) is based on the Primary Water Quality Criteria for Bathing Water mentioned in the Ministry of Environment, Forest and Climate Change (MoEFCC) Gazette Notification, 2000.

6.2 Study Area

A total number of 768 water quality monitoring stations in year 2024 covering all the important rivers of country were studied for water quality hotspots in rivers of India.

The coverage of WQ monitoring stations with respect to various parameters are given as shown below:

(A) For pH, Electrical Conductivity, Chloride and Total Hardness in figure-8.

(B) For Total Coliform and Faecal Coliform in figure-9.

(C) For Ammonia-N in figure-10.

(D) For Boron in figure-11.

(E) For Sodium Absorption Ratio (S.A.R.) in figure-12.

(F) For Fluoride in figure-13.

(G) For Nitrate-N in figure-14.

(H) For Dissolved Oxygen (D.O.) in figure-15.

(I) For BiochemicalOxygen Demand (B.O.D.) in figure-16.

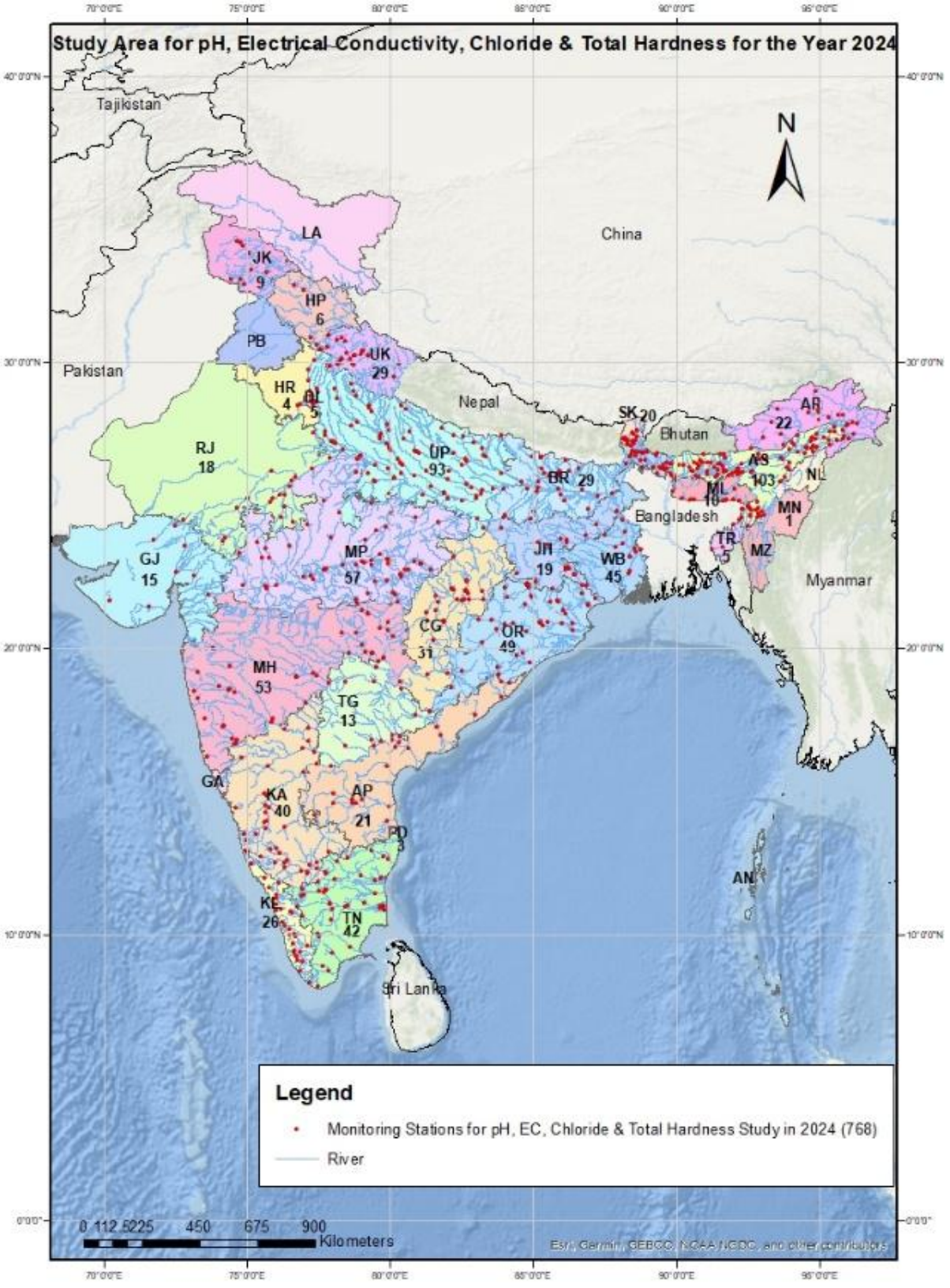


Fig 8: Study area of 768 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 (For pH, Electrical Conductivity, Chloride & Total Hardness)

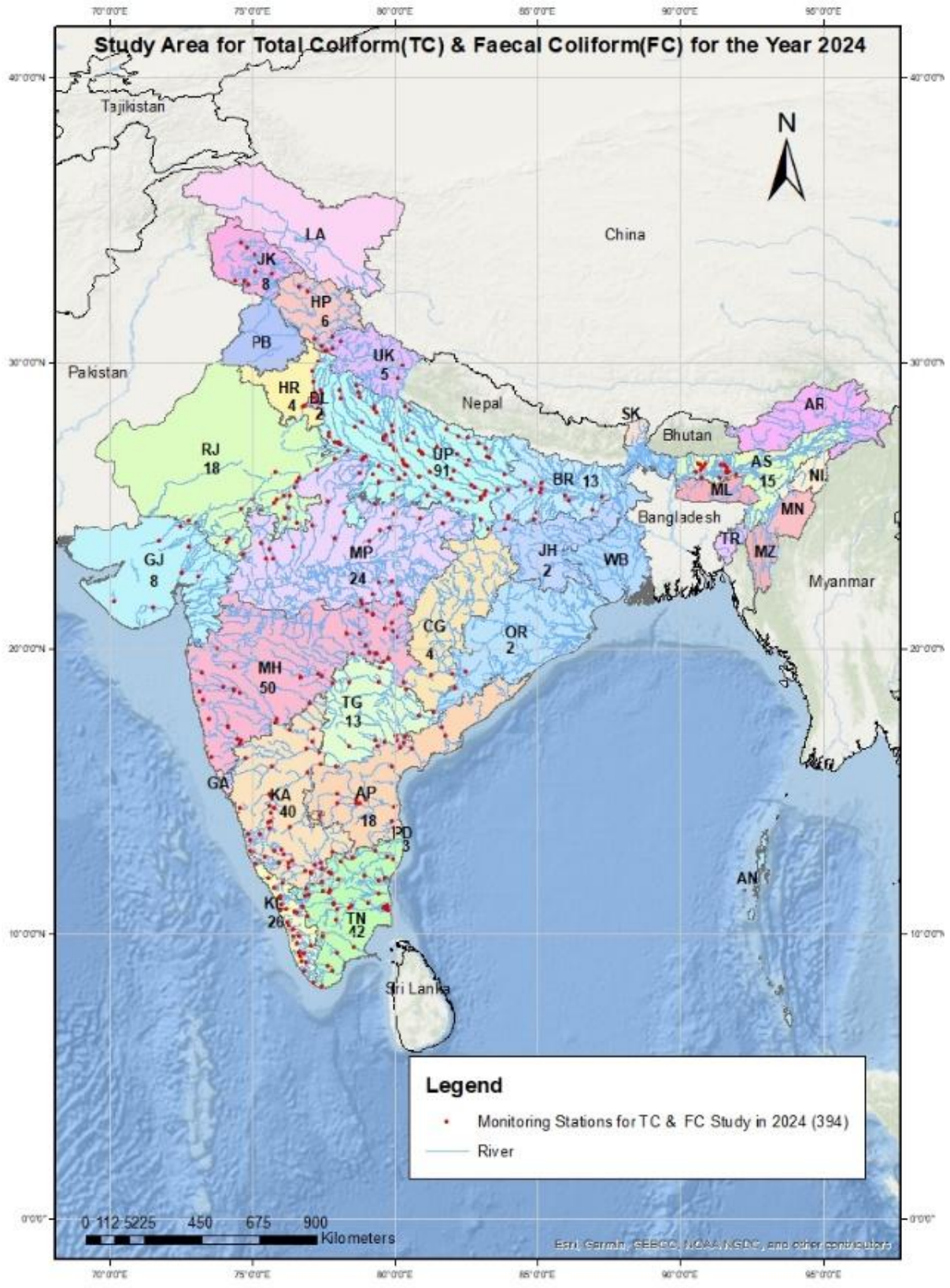


Fig 9: Study area of 394 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for TC & FC

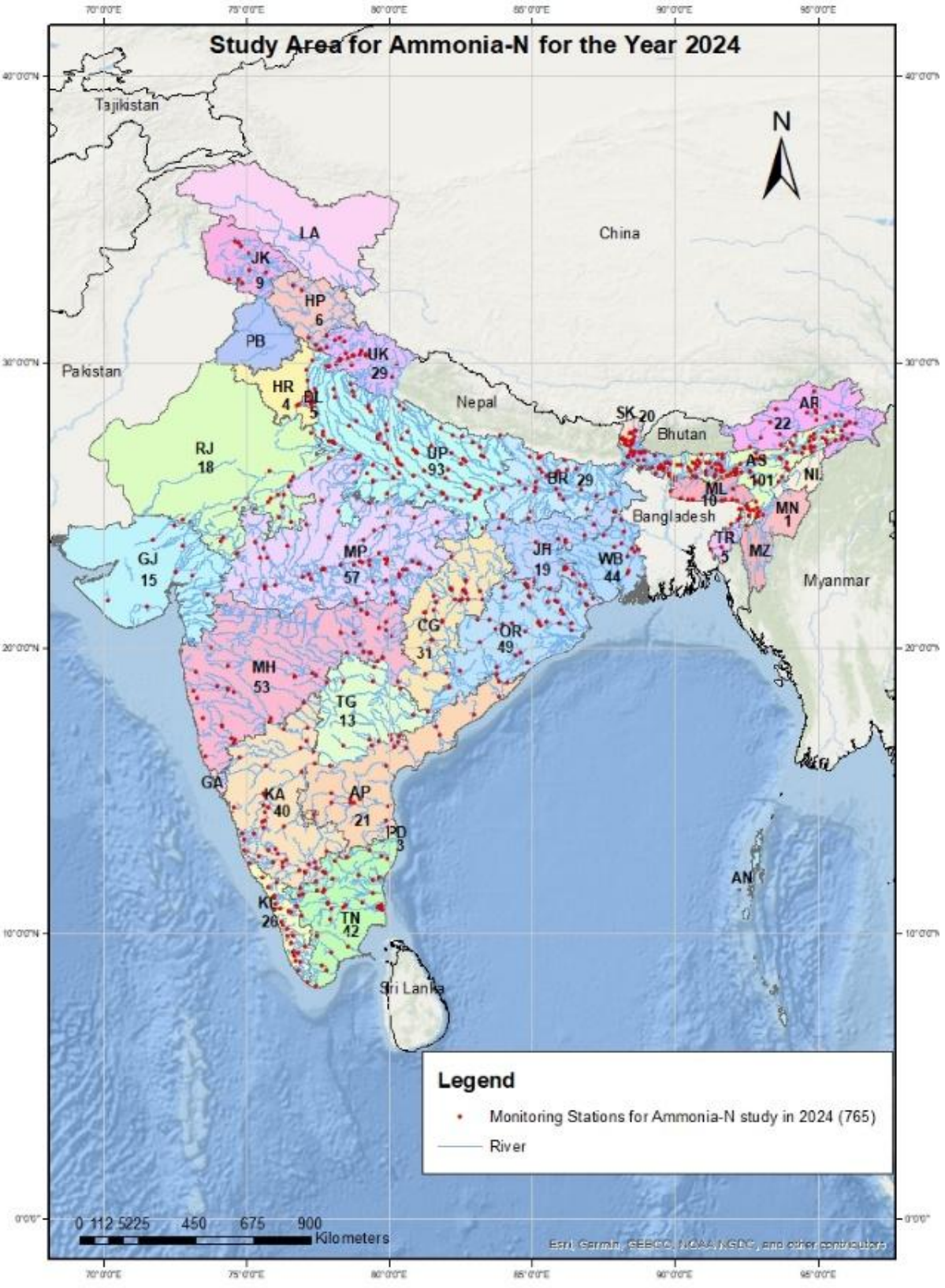


Fig 10: Study area of 765 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for Ammonia-N

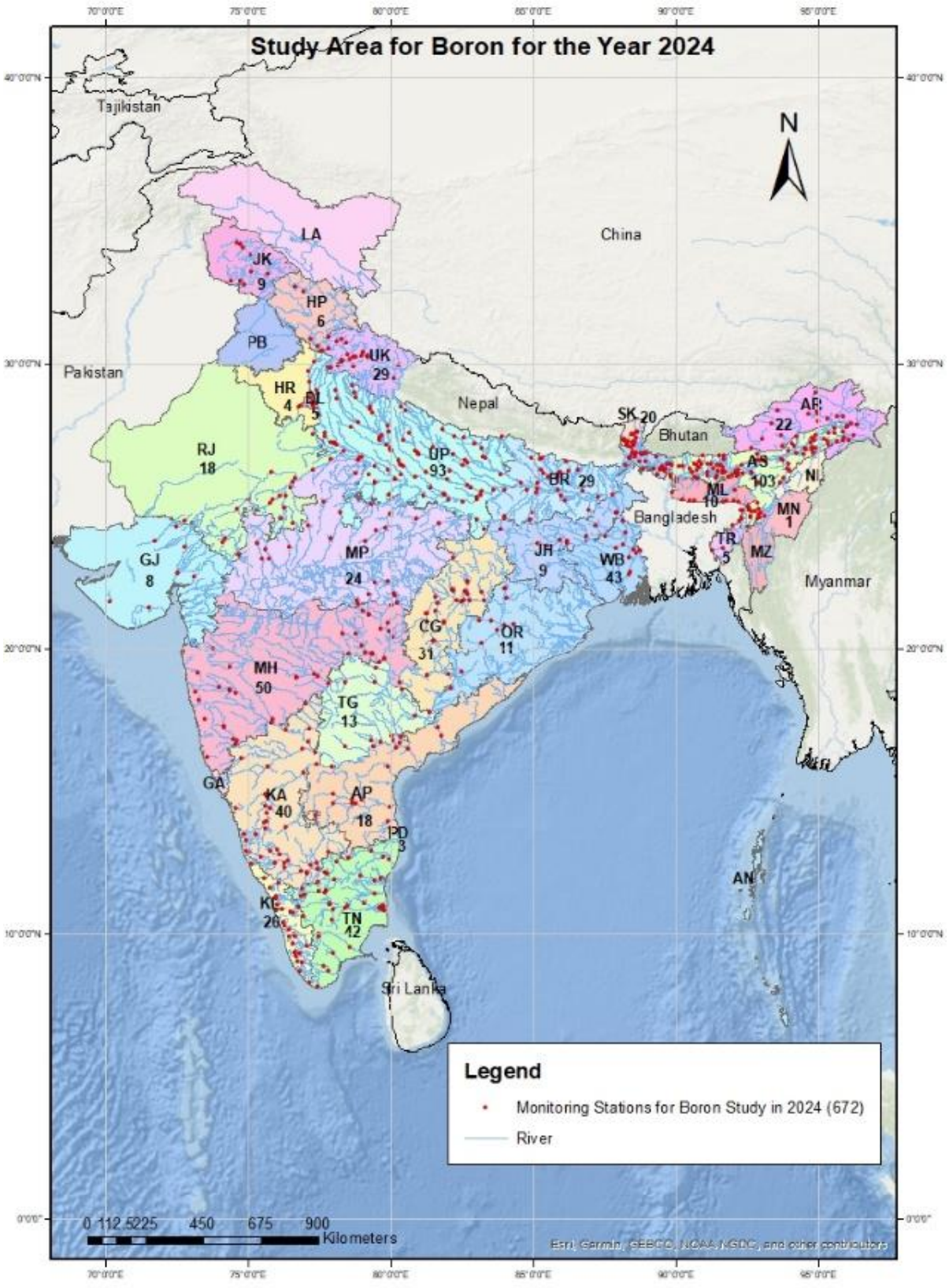


Fig 11: Study area of 672 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for Boron

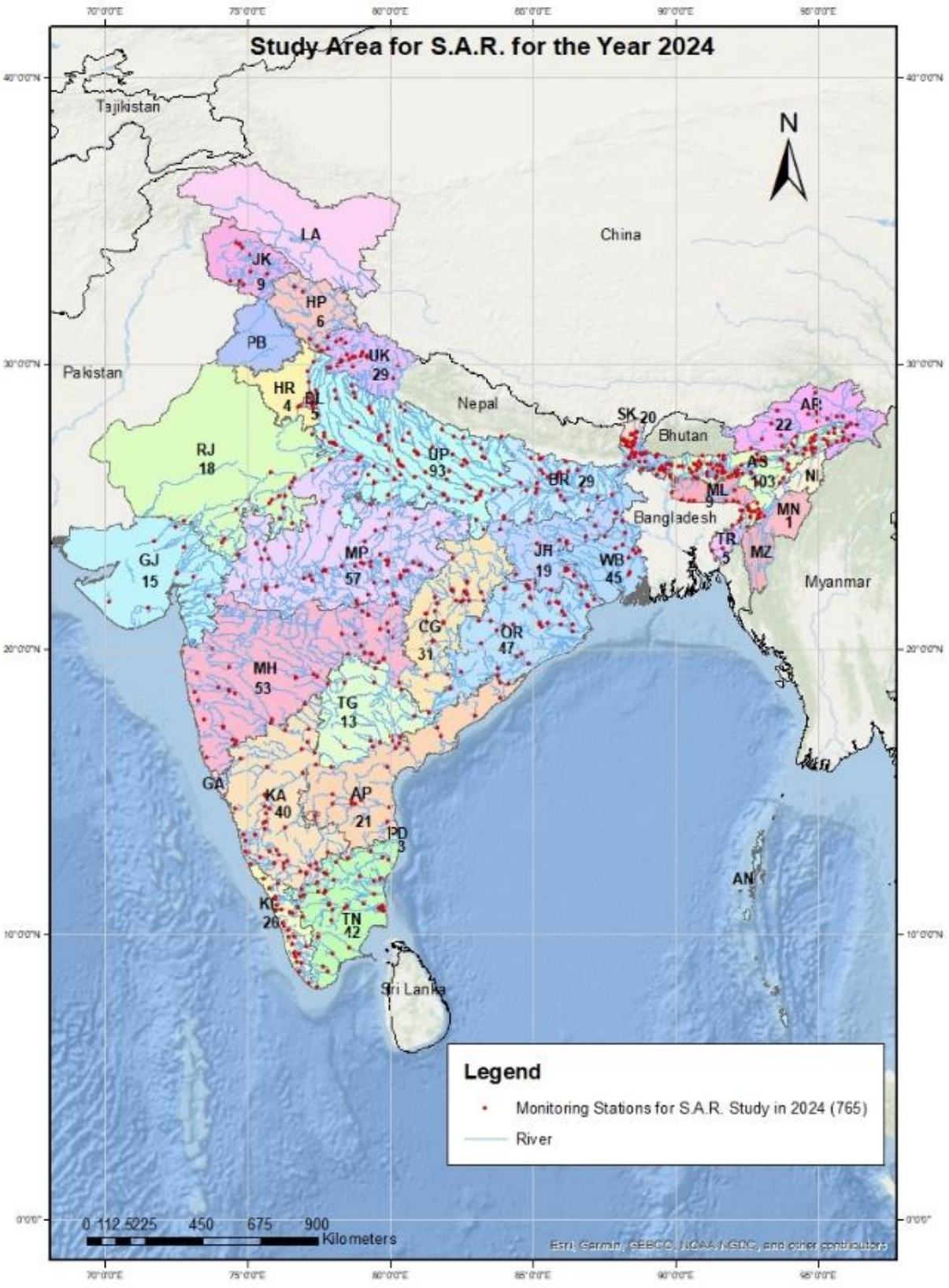


Fig 12: Study area of 765 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for S.A.R

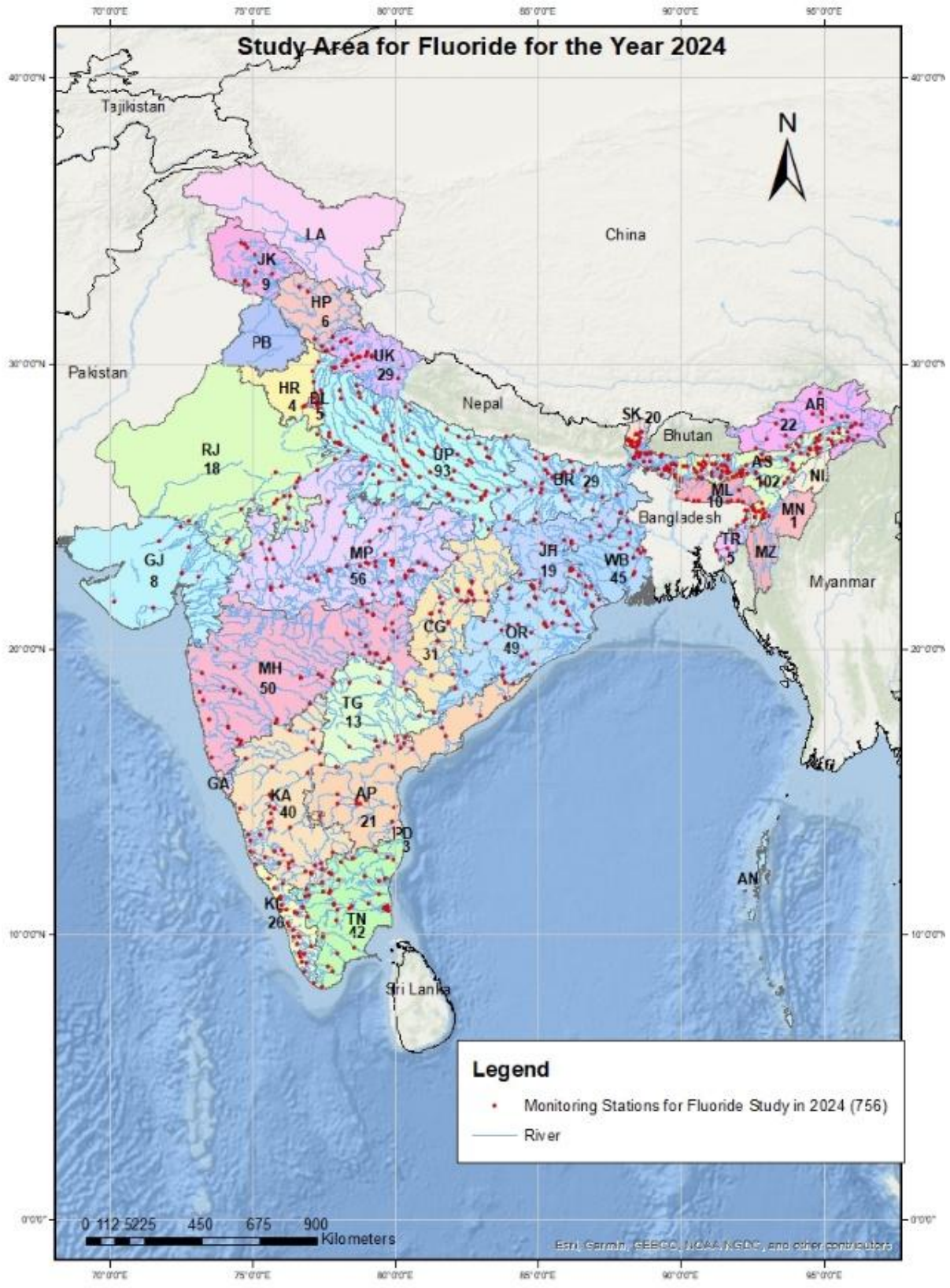


Fig 13: Study area of 756 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for Fluoride

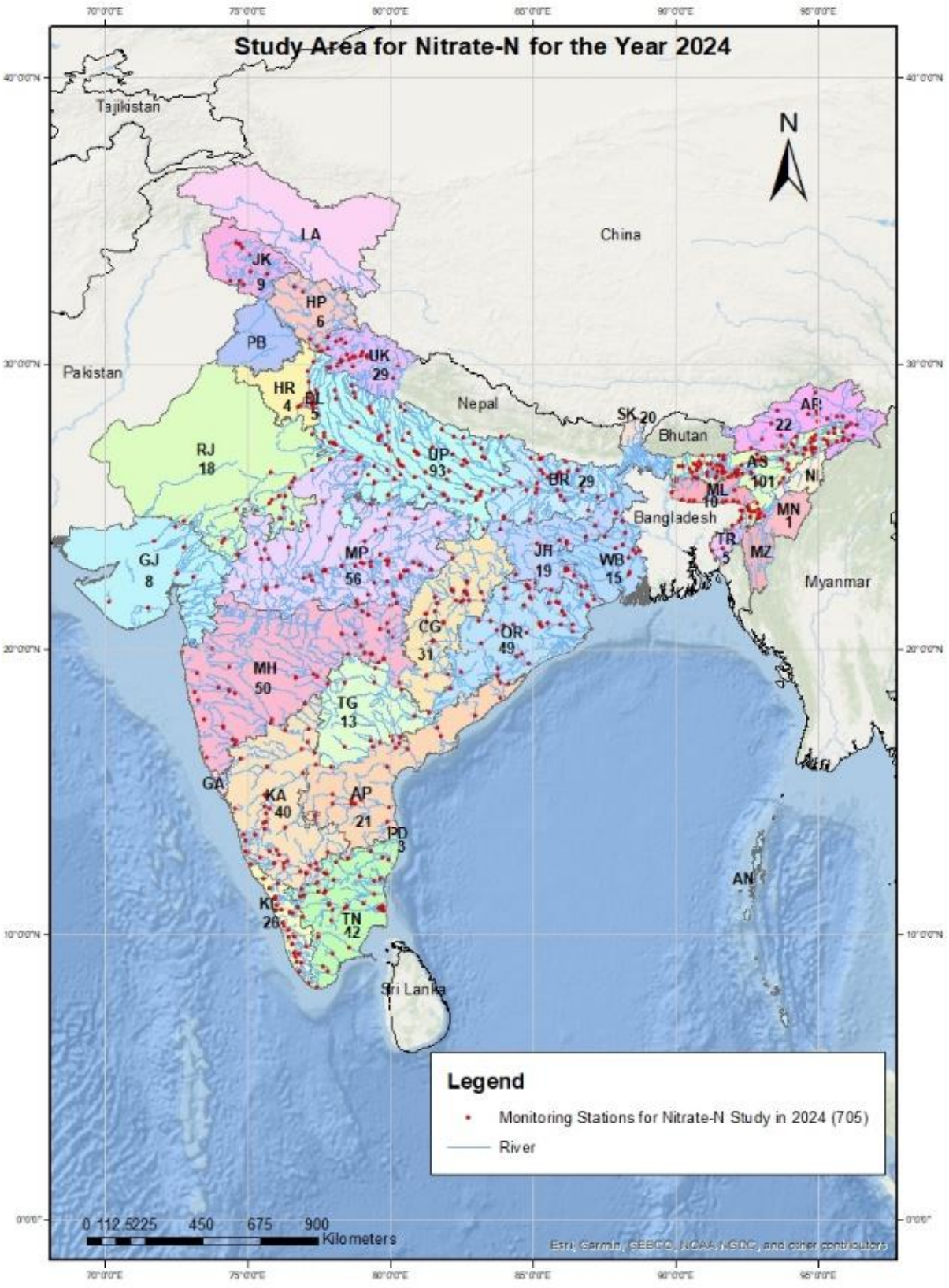


Fig 14: Study area of 705 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for Nitrate-N

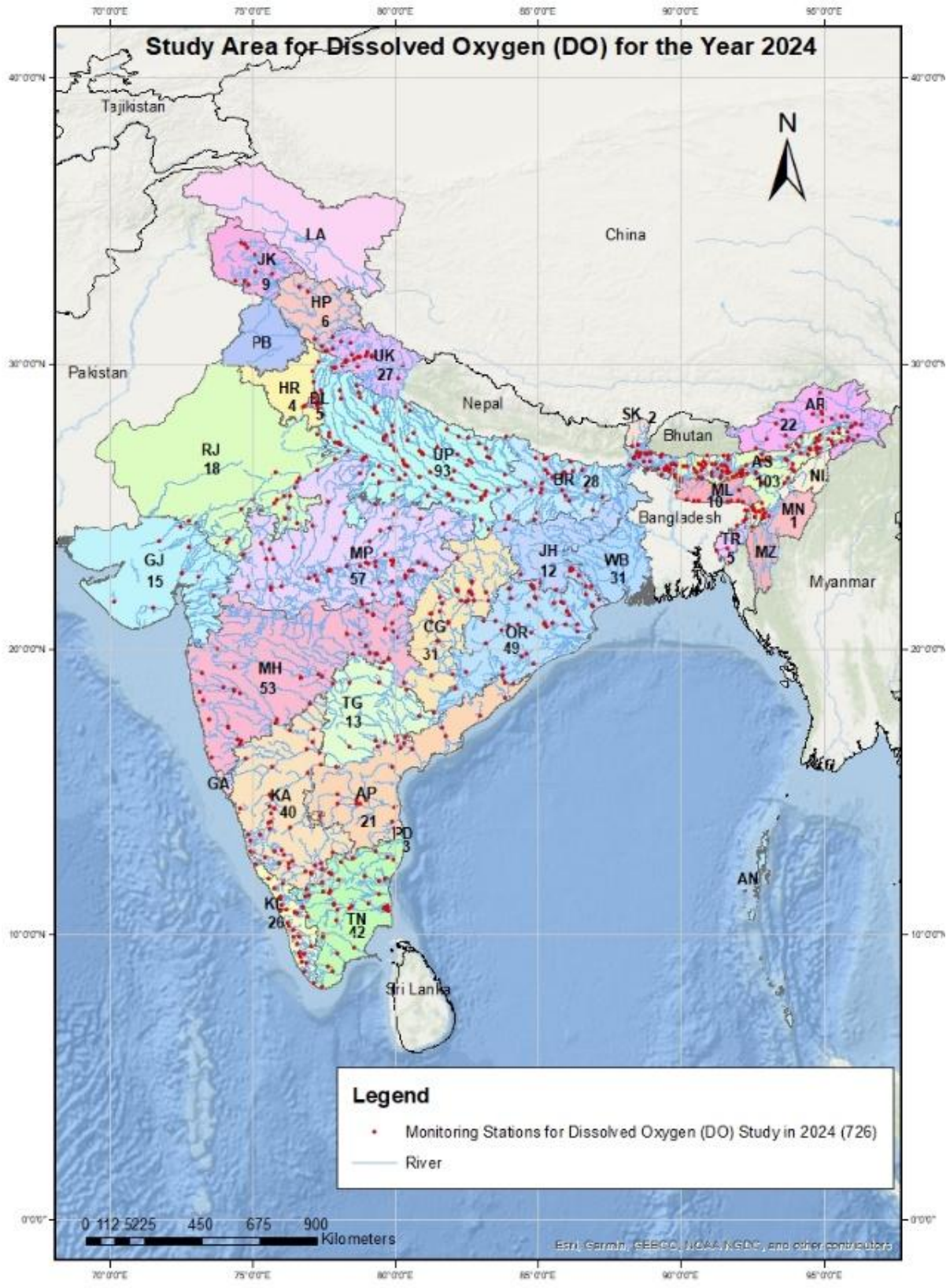


Fig 15: Study area of 726 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for Dissolved Oxygen (DO)

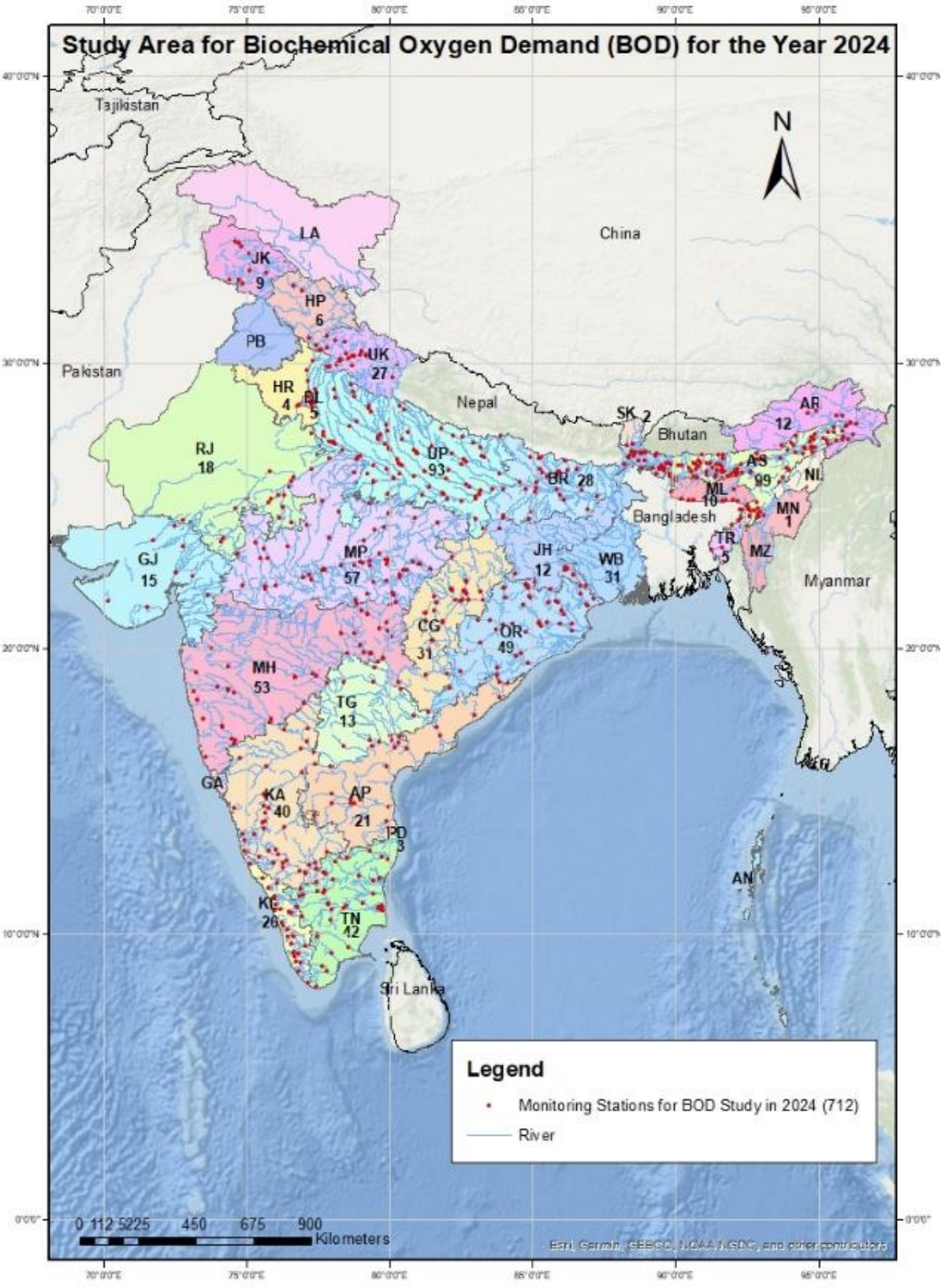


Fig 16: Study area of 712 Water Quality (WQ) Monitoring stations on important rivers of India in year 2024 for Biochemical Oxygen Demand

6.3 Water Quality Standard in India

Central Pollution Control Board (CPCB) has identified water quality requirements in terms of certain chemical characteristics, known as primary water quality criteria (Table 5). Based on this classification, the natural water has been categorized as Class-A Drinking Water Source without conventional treatment but after disinfection; Class-B Outdoor bathing (Organized); Class-C Drinking water source after conventional treatment and disinfection; Class-D Propagation of Wild life and Fisheries; Class-E Irrigation, Industrial Cooling, Controlled Waste disposal. Further BIS vide its document BIS 10500:2012 has recommended water quality standards for drinking water (Table 6).

Table 5: Designated Best Uses of Water by CPCB

Designated Best Use	Class	Criteria
Drinking Water Source without conventional treatment but afterdisinfection	A	1. Total Coliforms Organism MPN/100 ml shall be 50 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 6 mg/L or more 4. Biochemical Oxygen Demand 5 days 20 °C, 2mg/L or less
Outdoor bathing (Organised)	B	1. Total Coliforms Organism MPN/100 ml shall be500 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 5 mg/l or more 4. Biochemical Oxygen Demand 5 days 20 °C, 3mg/L or less
Drinking water source after conventional treatment and disinfection	C	1. Total Coliforms Organism MPN/100ml shall be5000 or less 2. pH between 6 and 9 3. Dissolved Oxygen 4 mg/L or more 4. Biochemical Oxygen Demand 5 days 20 °C, 3mg/Lor less
Propagation of Wild life and Fisheries	D	1. pH between 6.5 and 8.5 2. Dissolved Oxygen 4 mg/l or more 3. Free Ammonia (as N) 1.2 mg/L or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	1. pH between 6.0 and 8.5 2. Electrical Conductivity at 25 °C micro mhos/cm,maximum 2250 3. Sodium absorption Ratio Max. 26 4. Boron Max. 2 mg/L
	Below -E	Not meeting any of the A, B, C, D & E criteria

Table 6: Drinking Water Quality Standards, BIS: 10500, 2012

S. No.	Characteristic	Requirement (Acceptable Limit)	Permissible limit in the absence of Alternate source
Essential Characteristics			
1	Colour, Hazen units, Max	5	15
2	Odour	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable
4	Turbidity NTU, Max	1	5
5	pH Value	6.5 -8.5	No relaxation
6	Total Hardness (as $CaCO_3$) mg/L, Max.	200	600
7	Iron (as Fe), mg/L, Max	1.0	No relaxation
8	Chlorides (as Cl), mg/L, Max	250	1000
9	Residual free chlorine, mg/L, Minimum	0.2	1.0
Desirable Characteristics			
10	Total Dissolved solids, mg/L, Max	500	2000
11	Calcium (as Ca) mg/L, Max.	75	200
12	Magnesium (as Mg) mg/L, Max	30	100
13	Copper (as Cu), mg/L, Max	0.05	1.5
14	Manganese (as Mn) mg/L, Max	0.1	0.3
15	Sulphates (as SO_4), mg/L, Max	200	400
16	Nitrate (as NO_3) mg/L, Max.	45	No relaxation
17	Fluorides (as F), mg/L, Max	1.0	1.5
18	Ammonia (as total ammonia-N) mg/L	0.5	No relaxation
19	Mercury (as Hg), mg/L, Max	0.001	No relaxation
20	Cadmium (as Cd), mg/L, Max	0.003	No relaxation
21	Selenium (as Se), mg/L, Max	0.01	No relaxation
22	Total Arsenic (as As), mg/L, Max	0.01	No relaxation
23	Cyanides (as CN), mg/L, Max	0.05	No relaxation
24	Lead (as Pb), mg/L, Max	0.01	No relaxation
25	Zinc (as Zn), mg/L, Max	5	15
26	Anionic detergents (as MBAS), mg/L, Max	0.2	1
27	Total Chromium (as Cr), mg/L, Max	0.05	No relaxation
28	Polynuclear aromatic hydrocarbons (as PAH), mg/L, Max	-	-
29	Mineral oil, mg/L, Max	0.5	No relaxation
30	Pesticides mg/L, Max	Absent	0.001
33	Alkalinity mg/L, Max	200	600
34	Aluminum (as Al) mg/L, Max	0.03	0.2
35	Boron mg/L, Max	0.5	1.0

MINISTRY OF ENVIRONMENT AND FORESTS NOTIFICATION
New Delhi, the 25th September, 2000

Primary Water Quality Criteria for Bathing Waters:

In a water body or its part, water is subjected to several types of uses. Depending on the types of uses and activities, water quality criteria have been specified to determine its suitability for a particular purpose. Among the various types of uses there is one use that demands highest level of water quality or purity and that is termed as Designated Best Use in that stretch of water body. Based on this, water quality requirements have been specified for different uses in terms of primary water quality criteria. The primary water quality criteria for bathing water are specified along with the rationale.

Table 7: PRIMARY WATER QUALITY CRITERIA FOR BATHING WATER
(Water used for organised outdoor bathing)

CRITERIA		RATIONALE
1.Faecal Coliform MPN/100 ml	500 (desirable) 2500 (Maximum Permissible)	To ensure low sewage contamination. Faecal coliform and faecal streptococci are considered as they reflect the bacterial pathogenicity.
2. Faecal Streptococci MPN/100 ml	100 (desirable) 500 (Maximum Permissible)	The desirable and permissible limits are suggested to allow for fluctuation in environmental conditions such as seasonal change, changes in flow conditions etc.
2. pH	Between 6.5 -8.5	The range provides protection to the skin and delicate organs like eyes, nose, ears etc. which are directly exposed during outdoor bathing.
3. Dissolved Oxygen	5 mg/1 or more	The minimum dissolved oxygen concentration of 5 mg/1 ensures reasonable freedom from oxygen consuming organic pollution immediately upstream which is necessary for preventing production of anaerobic gases (obnoxious gases) from sediment.
4. Biochemical Oxygen demand 3-day,27°C	3 mg/1 or less	The Biochemical Oxygen Demand of 3 mg/1 or less of the water ensures reasonable freedom from oxygen demanding pollutants and prevent production of obnoxious gases.

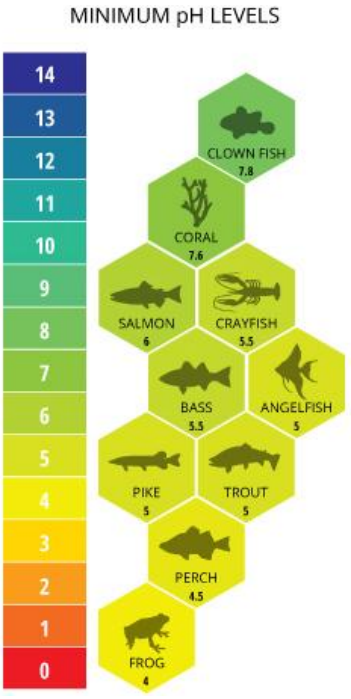
6.4 Water Quality Parameters

6.4.1 pH

The term pH stands for the power of hydrogen, and it is a measure of the acidity or alkalinity of a solution. The numerical value of pH is determined by the molar concentration of hydrogen ions (H+) present in the solution. The pH scale ranges from 1 to 14, where water with a pH of 7 is considered neutral, pH values below 7 are acidic, and pH values above 7 are considered basic or alkaline (Langland & Cronin, 2003). pH value done by taking the negative logarithm of the H+ concentration (-log(H+)).

$$pH = - \log_{10}[H^+] \text{ or } \log[1/H^+]$$

pH in water can be influenced by various factors, both natural and man-made. Natural changes in pH occur due to interactions with surrounding rock, particularly carbonate forms, and other materials. Precipitation, especially acid rain, and discharges from wastewater or mining operations can also cause fluctuations in pH levels. Additionally, the concentration of carbon dioxide (CO2) in water can influence pH levels (Hickin, 1995).



The pH of water is important because it affects the health of aquatic organisms and the solubility and toxicity of chemicals and heavy metals in the water. Most aquatic creatures prefer a pH range of 6.5-9.0, though some can live in water with pH levels outside of this range. If the pH of water is too high or too low, the aquatic organisms living within it will die (EPA, 2012).

Humans can tolerate a wider range of pH levels than aquatic organisms, but there are still concerns. pH values greater than 11 can cause skin and eye irritations, as does a pH below 4. A pH value below 2.5 will cause irreversible damage to skin and organ linings. Lower pH levels increase the risk of mobilized toxic metals that can be absorbed, even by humans, and levels above 8.0 cannot be effectively disinfected with chlorine, causing other indirect risks. In addition, pH levels outside of 6.5-9.5 can damage and corrode pipes and other systems, further increasing heavy metal toxicity (Fink, 2005). Therefore, it is important to maintain the pH levels of water within the recommended range of 6.5-8.5, as per CPCB's designated best uses of water (Class A and B).

6.4.2 Electrical Conductivity (EC)

Conductivity is a measure of water's ability to conduct an electrical flow, and it is directly related to the concentration of ions present in the water (Wetzel, 2001). These ions come from dissolved salts and inorganic materials like alkalis, chlorides, sulfides, and carbonate compounds. The more ions present in the water, the higher its conductivity (Langland & Cronin, 2003). Conversely, the fewer the ions in the water, the lower its conductivity. Compounds that dissolve into ions are known as electrolytes (Palermo, 2008).

Salinity and conductivity have a strong correlation, and conductivity is used in algorithms to estimate salinity and TDS, both of which affect water quality and aquatic life. Salinity is specifically important because it affects dissolved oxygen solubility. The higher the salinity level, the lower the dissolved oxygen concentration (DWFS,2014). Temperature affects conductivity by increasing ionic mobility and the solubility of salts and minerals. This can be seen in diurnal variations as a body of water warms up due to sunlight, and conductivity increases, and then cools down at night, decreasing conductivity NSIDC. (2014).

Heavy rainfall or other severe weather events can contribute to flooding, and the effect on conductivity depends on the water body and surrounding soil. In areas with dry and wet seasons, conductivity usually drops overall during the wet season due to the addition of the water source though the overall conductivity is lower for the season, there are often conductivity spikes as water initially enters a floodplain. If a floodplain contains nutrient-rich or mineralized soil, previously dry salt ions can enter solution as it is flooded, raising the conductivity of water (Sallenave, 2011). A sudden increase or decrease in conductivity in a body of water can indicate pollution. Agricultural runoff or a sewage leak will increase conductivity due to the additional chloride, phosphate, and nitrate ions. In both cases, the additional dissolved solids will have a negative impact on water quality (ESCT, 2013).

Most aquatic species have adapted to specific salinity levels, and salinity values outside of a normal range can result in fish kills due to changes in dissolved oxygen concentrations, osmosis regulation, and TDS toxicity (McManus & Woodson, 2012; Beskenis, 2006; Guiry, 2014).

6.4.3 Dissolved Oxygen (DO)

The amount of gaseous oxygen dissolved in water is known as dissolved oxygen, which enters the river water through diffusion from the atmosphere and as a by-product of aquatic plants' photosynthesis (Wetzel, 2001). The presence of dissolved oxygen in the aquatic habitat is crucial for the survival

of organisms living in water bodies, including fish and invertebrates. Animals require oxygen to survive, and fish, for instance, can't survive for long in water with less than 5 mg/L of dissolved oxygen (EPA, 2014). Most aquatic plants, fish and zooplankton need oxygen in water in order to breathe. Good oxygen levels are critical for the health of a river system. Slow flowing, polluted river water is often associated with low oxygen conditions, which cannot support much life.

The low level of dissolved oxygen in water indicates contamination and is an important factor in determining water quality, pollution control, and treatment processes. The level of dissolved oxygen in natural and wastewater depends on the physical, chemical, and biochemical activities occurring in water bodies. Oxygen is considered poorly soluble in water, and its solubility is related to temperature and pressure. The introduction of organic waste, especially domestic and animal sewage, industrial waste from paper mills, leather manufacturing, slaughterhouse sewage, and crop wastewater, significantly reduces the DO in river water. The wastes from these industries cause oxygen demand, and they're broken down and decomposed by bacteria into oxygen. Most oxygen-demanding waste is organic.

Low oxygen in water can be fatal to fish and other organisms living in water. A minimum of about 4 mg/L of DO is required for the survival of living organisms in water. Oxygen-depleting substances reduce the available DO. During the summer months, the rate of biological oxidation is significantly increased, yet the DO concentration is at its minimum due to higher temperatures. The DO concentration, temperature, and photosynthesis rate are interdependent and vary diurnally. The decrease in the DO concentration during nights due to the inhibition of photosynthetic activity and the increase in DO concentration due to active photosynthesis of microalgae during the daytime have been observed (Saba et al., 2017).

6.4.4 Biochemical oxygen Demand (BOD)

Biochemical Oxygen Demand (BOD) is a crucial parameter that quantifies the amount of dissolved oxygen required by aerobic biological organisms to break down organic materials within a river water sample (Armiento, 2016). Diverse sources contribute to BOD, encompassing municipal and industrial wastewater discharges, agricultural runoff, and leachate from landfills. Within rivers, oxygen consumption arises from a combination of aquatic animal respiration, decomposition processes, and various chemical reactions. Wastewater discharged from sewage treatment plants often contains organic substances, which are decomposed by microorganisms, consuming oxygen in the process. Additionally, stormwater runoff from farmland or urban

streets, feedlots, and malfunctioning septic systems can introduce oxygen-consuming wastewater.

Several factors influence BOD, including the type and quantity of organic material present, temperature, pH, dissolved oxygen concentration, and the presence of bacteria.

CPCB has recommended a concentration of 3.0 mg/l of biochemical oxygen demand for outdoor bathing. Water having above 3.0 mg/l BOD concentration is not suitable for outdoor bathing. In pristine conditions, rivers generally exhibit a 5-day carbonaceous BOD below 1 mg/L. In moderately polluted scenarios, BOD values fall within the range of 2 to 8 mg/L. Rivers cross the threshold into severe pollution when BOD values exceed 8 mg/L (Grover and Wats, 2013).

The impact of high BOD on the aquatic ecosystem is significant because it can lead to the death of aquatic life. The high levels of BOD can deplete the dissolved oxygen levels in the water, which can cause fish and other aquatic life to suffocate. Additionally, the high levels of BOD can cause the water to become cloudy and murky, making it difficult for aquatic life to thrive.

6.4.5 Total Hardness (TH)

The definition of water hardness is based on the measured content of divalent metal cations, with dissolved calcium (Ca++) and magnesium (Mg++) being the two primary divalent cations found in most waters. In natural water sources, calcium and magnesium are typically bound to bicarbonate, sulfate or chloride. The main sources of water hardness are sedimentary rocks, seepage and runoff from soils. Generally, hard waters originate from areas with thick topsoil and limestone formations, with groundwater tending to be harder than surface water. The two main industrial sources of water hardness are the inorganic chemical and mining industries. (Sawyer & McCarty, 1967; Biesecker & George, 1972).

To classify water hardness, general guidelines are as follows: 0 to 60 mg/L as CaCO3 is considered soft water; 61 to 120 mg/L as moderately hard water; 120 to 180 mg/L as hard water; and more than 180 mg/L as very hard water.

The hardness of water is harmful to the boilers and hot water pipes as the deposition of salts occur, which can reduce their efficiency. The hard water is not good for washing as it is difficult for hard water to form lather with soap (Ramya et al 2015). The World Health Organisation states that hard water has no known adverse health effects (Akram, 2018). There are no serious health effects associated with drinking hard water. However solid water acts as a dietary supplement as it contains calcium and magnesium that

strengthens bones and teeth (Sengupta, 2013). Hard water contains high concentration of dissolved minerals therefore millions of people think that these dissolved minerals have positive effects on the health of its drinkers ((Sawyer & McCarty, 1967; Biesecker & George, 1972).

6.4.6 Nitrate (NO_3^-)

Nitrate is a compound that can be found in the environment naturally and synthetically under various conditions. The amount of nitrogen present or both nitrogen and oxygen are used to measure nitrate in drinking water, which is the principal form of combined nitrogen that is present in natural waters. It serves as a nutrient that stimulates plant growth. However, excessive amounts of nitrogen may lead to the proliferation of macrophytes or phytoplankton. Nitrates can be contributed to freshwater through the discharge of sewage and industrial waste, as well as run-off from agricultural fields. Nitrate is the final product of the oxidation of ammonia. Effluents such as sewage contain high levels of ammonia, which can increase nitrate concentrations in receiving waters. High levels of nitrate in river waters may indicate pollution, even though this form of nitrogen can be used as a source of nutrients for plants and encourage plant proliferation (Hamzaraj et al., 2014).

The standard for nitrate in drinking water is 10.16 mg/L nitrate as N (NO_3^--N) or 45 mg/L nitrate (NO_3^-). Nitrate in drinking water can cause Methemoglobinemia or blue baby syndrome, which is a significant health problem associated with nitrate.

6.4.7 Fluoride (F^-)

Fluoride is a natural element that is commonly found in water sources, soil, and various foods. It is the 13th most abundant element, commonly occurring in the minerals fluorspar (CaF_2), cryolite (Na_3AlF_6) and fluorapatite ($3Ca_3(PO_4)_2$ $Ca(F,Cl)_2$) while industrial wastes, use of extensive fertilizers and brick kilns are examples of the anthropogenic sources (Cotton & Wilkinson, 1988; Mackay & Mackay, 1989).

Fluoride is beneficial for dental health because it helps strengthen tooth enamel and makes teeth more resistant to acid attacks from bacteria and sugars. However, excessive fluoride intake can lead to health issues (CPHA, 1979). The maximum permissible limit of Fluoride as per IS 10500-2012 for drinking water is 1.5 mg/L. Excessive exposure to fluoride during tooth development, especially in childhood, can lead to a cosmetic issue known as dental fluorosis. This condition results in changes in tooth enamel color and, in more severe cases, pitting or mottling of the teeth. Prolonged exposure to

very high levels of fluoride, usually through drinking water with concentrations well above recommended levels, can lead to skeletal fluorosis. This condition affects the bones and joints and can cause pain and limited mobility (Hussain et al., 2010).

6.4.8 Chloride (Cl^-)

Chloride (Cl^-) ion is a major inorganic anion found in water and wastewater, occurring naturally in all types of water. It is widely distributed in nature, mainly as the sodium (NaCl) and potassium (KCl) salts, and constitutes about 0.05% of the lithosphere (NRCC, 1977). The greatest amount of chloride found in the environment is in the oceans. The salty taste produced by chloride concentrations is variable and dependent on the chemical composition of water. The presence of chloride in river water can be attributed to various sources, such as the dissolution of salts in soil, discharge of effluents from chemical industries, sewage discharge, contamination from refuse leachates, and sea water intrusion in coastal areas. Each of these sources leads to local contamination of river water. Chloride concentration serves as an indicator of sewage pollution in fresh water regions, with the discharge of domestic sewage being the most significant source of chlorides in the waters.

Chloride is an essential element and the main extracellular anion in the body. It is a highly mobile ion involved in maintaining proper osmotic pressure, water balance, and acid–base balance. Small amounts of chlorides are required for normal cell functions in plant and animal life. Fish and aquatic communities cannot survive in high levels of chlorides. The World Health Organization (WHO), Bureau of Indian Standard, and other regulatory bodies provide guidelines for safe levels of chloride in drinking water, typically below 250 milligrams per liter (mg/L) (WHO, 1979).

High chloride concentrations in water can affect the aesthetic quality of the water, imparting a salty taste. While this doesn't pose a direct health risk, it can lead to consumer dissatisfaction with the water's taste and smell. Individuals with certain health conditions, such as hypertension (high blood pressure) or cardiovascular diseases, may need to monitor their salt intake, including chloride. High chloride levels in water can contribute to increased sodium intake. Excessive chloride in water can have negative effects on aquatic ecosystems, particularly in freshwater environments, and can harm aquatic life, including fish and other organisms sensitive to changes in water quality (CNHW, 1983).

6.4.9 Boron (B)

Boron is a naturally occurring element found in the earth's crust and found in fruits, vegetables, and water sources. It binds to oxygen, forming borates, and is released into the environment through natural processes and human-made activities. Boron is essential for plant growth, but the required amount is relatively low. If boron exceeds a specific tolerance level, it may lead to injury. The range between boron deficiency and toxicity for many crops is narrow. To sustain an adequate supply of boron, at least 0.02 ppm of boron in irrigation water may be necessary, while boron levels should be lower than 0.3 ppm to avoid toxicity. Higher boron concentrations may require an evaluation of the intended crop's boron tolerance. Boron toxicity is not a widespread issue, but it can be a crucial parameter for assessing irrigation water quality. Plants grown in soils high in lime may tolerate higher boron levels than those grown in non-calcareous soils. Boron is weakly adsorbed by soils, meaning its root-zone concentration may not directly vary with the degree of boron concentration in irrigation water during plant growth. Symptoms of boron injury may include leaf 'burning,' chlorosis, and necrosis, although some boron-sensitive species may not exhibit obvious symptoms.

6.4.10 Ammonia (NH_3)

Ammonia is a commonly found pollutant in aquatic environments around the world (CEPA, 1999; Camargo & Alonso, 2006). Ammonia occurs naturally in water bodies, arising from the microbiological decomposition of nitrogenous compounds in organic matter. Fish and other aquatic organisms also excrete ammonia. Ammonia may also be discharged directly into water bodies by some industrial processes or as a component of domestic sewage or animal slurry. Ammonia can also arise in waters from the decay of discharged organic waste. Natural (unpolluted) waters contain relatively small amounts of ammonia, usually < 0.02mg/L as N. The presence of ammonia in freshwater has been associated with the acidification of rivers and lakes, eutrophication, and direct toxicity to aquatic organisms (CEPA, 1999; Camargo & Alonso, 2006; Baker et al., 1991). Ammonia exists in aqueous solutions in two forms, ionized (NH_4^+) and unionized (NH_3) and the unionized fraction is toxic to freshwater fish at very low concentration. The relative proportions of ionized and unionized ammonia in water depend on temperature and pH and to a lesser extent on salinity. The concentration of unionized ammonia becomes greater with increasing temperatures and pH and with decreasing salinity.

The toxicity of this compound on aquatic organisms will depend on the chemical form of ammonia, pH, and temperature. Furthermore, it will depend on the time of exposure (Francis-Floyd, 2009). This compound

damages the gills, liver, kidney, spleen and other organ tissues of fish, therefore causing breathing difficulties (Benli et al., 2008; Schram et al., 2010). This may lead to physiological alterations and, eventually, exhaustion or death (Schram et al., 2010). Ammonia can cause cell damage and can also affect the antioxidant defence system, thus altering the levels of oxidative stress in fish (EPA, 2013; Sinha et al., 2014). Ammonia can also alter fish behaviour. Fish exposure to sub-lethal concentrations of ammonia can reduce swimming activity (Wicks et al., 2002), foraging behaviour (Tudorache, 2008), and the ability to flee from predators (Tudorache, 2008; McKenzie, 2009).

6.4.11 Sodium Absorption Ratio (S.A.R.)

The sodium adsorption ratio (SAR) is a crucial parameter for managing soil quality in agriculture. It determines the suitability of irrigation water by analyzing the concentrations of different cations, including the primary alkaline and earth alkaline cations in the water. The SAR indicates the relative proportion of sodium to other cations in the water, which affects the soil structure's potential for degradation. If the soil contains excessive sodium, it can lead to sodicity, causing soil structure degradation and higher erosion rates. The SAR value is significant as it predicts the potential for sodium accumulation in the soil. Higher SAR values indicate a higher risk of soil problems due to sodium accumulation, such as decreased permeability and soil structure degradation. Sodic soils, resulting from excessive sodium, can also lead to poor water infiltration, drainage problems, and decreased crop yields (Laxmi et al., 2022).

6.4.12 Total Coliforms (TC) and Faecal Coliforms (FC)

Coliforms are one of the most useful indicator organisms which are easily detectable. Total Coliforms represent a group of 16 species of bacteria that are found in soil, vegetation, animal wastes and human sewage. Their presence gives an idea about the pollution level of the water bodies. Coliforms are called indicators because their presence give an indication of the possibility of presence of other microorganisms including harmful pathogens. Fecal coliforms represent a sub category of TC with 6 species including the harmful E. coli bacteria. These are determined by the Most Probable Number (MPN) method. MPN method is a statistical, multi-step assay consisting of presumptive, confirmed and completed phases.

CHAPTER – 7

7.1 Results and Comparison with Hot Spots reported in 2023

7.1.1 pH

The pH value is expressed as the ratio of $[H^+]$ to $[OH^-]$ (hydroxide ion concentration). The Bureau of Indian Standards (BIS) recommends a desirable pH range of 6.5 to 8.5 for drinking water. This limit is also set by the Central Pollution Control Board (CPCB) for various water classes: Class A (drinking water source after disinfection), Class B (organized outdoor bathing), Class D (wildlife propagation), and Class E (fisheries and irrigation), all defined within the 6.5 to 8.5 range. Water samples from various monitoring stations across different rivers in India were analyzed for pH during the pre-monsoon, monsoon, and post-monsoon seasons, and the data were compared to the CPCB's recommended pH limits.

pH values across various monitored sites during the pre-monsoon, monsoon, and post-monsoon seasons show significant variability. This indicates diverse environmental conditions and potential anthropogenic influences. In 2024, the minimum pH value observed was 4.57 at Kharkhana, Myntdu River, Meghalaya, and the maximum pH value was 8.89 at Barod, Kalisindh River, Rajasthan. Throughout the study period, 30 water quality stations at 21 rivers (Parwan, Banas, Kalisindh, Tungabhadra, Godavari, Gambhiri, Peddavagu, Gomti, Myntdu, Parwati, Bhima, Chambal, Edduvagu, Ajay, Mahi, Karuvannur, Sai, Purna, Dindi, Krishna, Wainganga) recorded pH levels that exceeded the acceptable limit.

During the pre-monsoon season, pH values ranged from 4.97 at Kharkhana (Myntdu River, Meghalaya) to 8.89 at Barod, Kalisindh River and Rajasthan. This wide range reflects the diverse nature of rivers, with 20 sites exceeding the acceptable pH limit, either above or below the acceptable range of pH 6.5-8.50. In the monsoon season, pH levels ranged from 5.95 at Kharkhana (Myntdu River, Meghalaya) to 8.67 at Mandawara (Chambal River, Rajasthan). Despite the narrower range compared to the pre-monsoon season, 10 sites still exceeded the acceptable pH limit. Similarly, during the post-monsoon season, pH values varied from 4.57 at Kharkhana (Myntdu River, Meghalaya) to 8.72 at Barod (Kalisindh River, Rajasthan). Although the range is slightly narrower than in other seasons, 8 sites still surpassed the acceptable pH limit.

Comparision between 2023 & 2024:

The comparison of pH hot spots between 2023 and 2024 reveals significant trends across the different seasons: Pre-Monsoon, Monsoon and Post-

Monsoon.

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for pH		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	23	20	14	11
2024	30	20	10	8

During the pre-monsoon, in 2023, there were 20 hot spots identified for pH levels, which unchanged in 2024. During the monsoon season, the number of hot spots during the monsoon period decrease from 14 in 2023 to 10 in 2024, representing a substantial decrease of 28%. In the post-monsoon phase, hot spots decreased from 11 in 2023 to 8 in 2024, which indicates decrease of 27%.

Seven (07) water quality stations, namely Barod, Kharkhana, Maighat, Mantralayam, Padardibadi, Palakkadavu, Pratapgarh, located along seven rivers (Kalisindh, Myntdu, Gomti, Tungabhadra, Mahi, Karuvannur, Sai), were identified as common hotspot stations during both 2023 and 2024.

The hot spot study and GIS map for pH parameter are given below in Table 8 and figure 17.

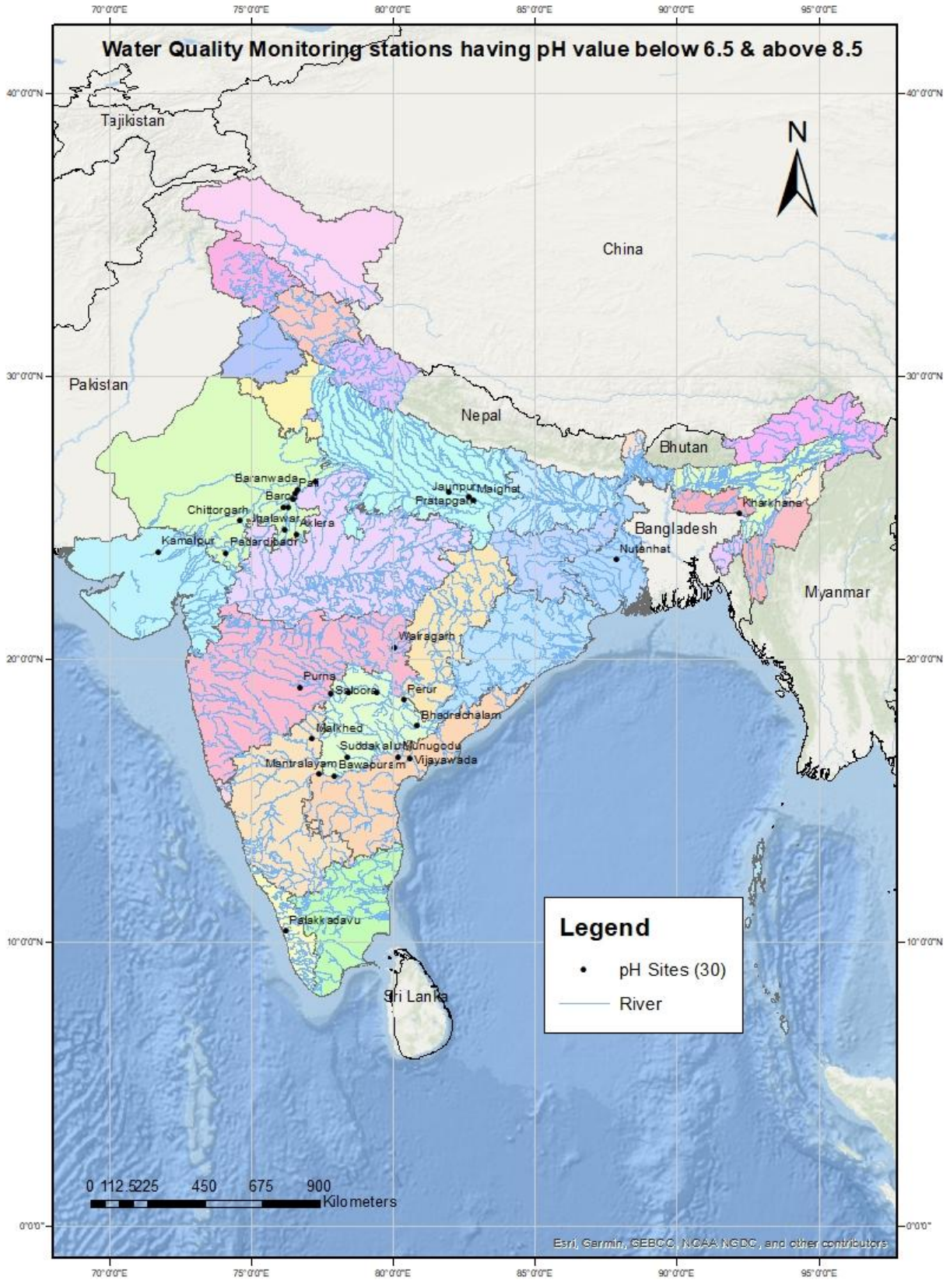
Table 8: Monitoring stations having pH value above 8.5 & below 6.5 in River Water in 2024

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	Aklera	Parwan	CD, Jaipur	Rajasthan	Jhalawar	*	8.62	*
2	Baranwada	Banas	CD, Jaipur	Rajasthan	Sawai-madhopur	*	8.51	-
3	Barod	Kalisindh	CD, Jaipur	Rajasthan	Kota	8.89	8.65	8.72
4	Bawapuram	Tungabhadra	LKD, Hyderabad	Andhra Pradesh	Kurnool	-	-	8.51
5	Bhadrachalam	Godavari	LGD, Hyderabad	Telangana	Bhadradri-Kothagudem	8.53	-	8.51
6	Chittorgarh	Gambhiri	CD, Jaipur	Rajasthan	Chittorgarh	*	8.56	*
7	Gandlapet	Peddavagu	UGD, Hyderabad	Telangana	Nizamabad	8.63	-	-
8	Jaunpur	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	-	-	8.64
9	Jhalawar	Kalisindh	CD, Jaipur	Rajasthan	Jhalawar	*	8.55	*
10	Kamalpur	Banas	MD, Gandhinagar	Gujarat	Banaskantha	*	8.55	*
11	Kharkhana	Myntdu	MID, Shillong	Meghalaya	East Jaintia Hills	4.97	6.19	4.57
12	Khatoli	Parwati	CD, Jaipur	Rajasthan	Kota	-	8.54	-
13	Maighat	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	8.52	-	8.60
14	Malkhed	Bhima	LKD, Hyderabad	Karnataka	Gulbarga	8.59	-	-
15	Mancherial	Godavari	UGD, Hyderabad	Telangana	Adilabad	8.58	-	-
16	Mandawara	Chambal	CD, Jaipur	Rajasthan	Kota	8.61	8.67	-
17	Manderial	Chambal	CD, Jaipur	Rajasthan	Karauli	8.59	-	-
18	Mantralayam	Tungabhadra	LKD, Hyderabad	Andhra Pradesh	Kurnool	*	-	8.56
19	Munugodu	Edduvagu	LKD, Hyderabad	Andhra Pradesh	Guntur	8.56	-	-
20	Nutanhat	Ajay	DD, Asansol	West Bengal	Purba Bardhaman	8.51	-	-
21	Padardibadi	Mahi	MD, Gandhinagar	Rajasthan	Dungarpur	-	-	8.57
22	Palakkadavu	Karuvannur	SWRD, Kochi	Kerala	Thrissur	6.43	-	-
23	Pali	Chambal	CD, Jaipur	Rajasthan	Sawai-madhopur	8.72	8.60	-
24	Perur	Godavari	UGD, Hyderabad	Telangana	Mulugu	8.51	-	-
25	Pratapgarh	Sai	MGD-3, Varanasi	Uttar Pradesh	Pratapgarh	8.63	-	-
26	Purna	Purna	UGD, Hyderabad	Maharashtra	Parbhani	8.71	-	-
27	Saloora	Godavari	UGD, Hyderabad	Telangana	Nizamabad	8.60	-	-
28	Suddakallu	Dindi	LKD, Hyderabad	Telangana	Mahaboob Nagar	8.69	-	-
29	Vijayawada	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	8.67	-	-
30	Wairagarh	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	6.20	-	-

(-) means No Hotspot.

(*) means Data not available/ river dry.

Figure 17: Water Quality Monitoring stations having pH value below 6.5 & above 8.5 (2024)



7.1.2 Electrical Conductivity (EC)

Conductivity is a measure of water's ability to conduct an electrical flow, and it is directly related to the concentration of ions present in the water (Wetzel, 2001). The conductivity measurement is directly affected by the number of dissolved ions in the solution. These ions come from dissolved salts and inorganic materials like alkalis, chlorides, sulfides, and carbonate compounds. The more ions present in the water, the higher its conductivity (Langland & Cronin, 2003). Conversely, the fewer the ions in the water, the lower its conductivity.

Bureau of Indian Standards (BIS) has set a recommended drinking water standard for total dissolved solids (TDS) at 500 mg/l (equivalent to about 750 µS/cm at 25°C). This limit can be increased to a TDS of 2000 mg/l (about 3000 µS/cm at 25°C) if no alternative source is available. Additionally, the Central Pollution Control Board (CPCB) has specified a maximum of 2250 µS/cm at 25°C for class-E irrigation, industrial cooling, and controlled waste disposal.

During the pre-monsoon, monsoon, and post-monsoon seasons, eleven (11) water quality monitoring stations— B.P.M. (Bamni) on Wardha River, Dadri on Sahibi River, Dhalegaon on Godavari River, Dhansa on Sahibi River, Elunuthi mangalam on Noyyal River, Lakshmanapatti on Kodaganar River, Luwara on Shetrunji River, T. Ramapuram on Hagari River, Thevur on Sarabenga River, Varanavasi on Marudaiyar River and Vautha on Sabarmati River —exceeded the conductivity limit of 2250 µS/cm.
Dhalegaon on River Godavari, T. Ramapuram on River Hagari, Thevur on River Sarabenga, Vautha on River Sabarmati (pre monsoon) and Varanavasi on Marudaiyar (post Monsoon) water quality stations exceeded the acceptable limit in one season only.
Out of eleven (11) water quality monitoring stations, water quality at four (03) stations namely- B.P.M. (Bamni) on Wardha River, Elunuthimangalam on Noyyal River and Lakshmanapatti on Kodaganar River exceeded the acceptable electrical conductivity limit during all seasons. The Wardha River at the B.P.M. station showed an increase in water quality from the pre-monsoon to the monsoon period, with a decrease in electrical conductivity from 5110 µS/cm to 4142 µS/cm. However, there was a subsequent decrease in conductivity during the post-monsoon period to 3507 µS/cm, indicating a dillution after the monsoon season. Noyyal River at the Elunuthi Mangalam station showed decreasing conductivity levels across different seasons. During the pre-monsoon period, conductivity was moderate at 3336 µS/cm, it decreases significantly during the monsoon

period to 2818 µS/cm subsequent decreasing to 2335 µS/cm in the post-monsoon period. The Kodaganar River at the Lakshmanapatti station exhibited relatively stable conductivity levels across seasons, with an increase during the monsoon period. During the pre-monsoon period, conductivity was recorded at 2639 µS/cm, which increased to 3010 µS/cm during the monsoon, and then increased slightly to 3098 µS/cm in the post-monsoon period. The Shetrunji River at the Luwara station showed a significant decrease in conductivity from the pre-monsoon to the monsoon period, followed by a slight increase in the post-monsoon period. During the pre-monsoon period, conductivity was exceptionally high at 8576 µS/cm, but it decreased during the monsoon to 1575 µS/cm before further increasing to 2382 µS/cm in the post-monsoon period.

Comparision between 2023 & 2024:

The comparison of hotspots at various monitoring stations along rivers during the years 2023 and 2024 reveals significant changes in river water quality. Specifically, the comparison of water quality hotspots at monitoring stations along the Wardha River in Maharashtra, the Noyyal River in Tamil Nadu, and the Shetrunji River in Gujarat during the years 2023 and 2024 shows significant variations in electrical conductivity. The Central Pollution Control Board (CPCB) has set the limit for class-E irrigation, industrial cooling, and controlled waste disposal at less than 2250 µS/cm at 25°C.

The comparison of electrical conductivity hot spots between 2023 and 2024 reveals significant trends across the different seasons: Pre-Monsoon, Monsoon and Post-Monsoon.

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Electrical Conductivity		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	6	5	5	4
2024	11	8	5	5

In 2023, six (06) water quality stations observed values above the acceptable limit: B.P.M. (Bamni) on River Wardha, Durvesh on River Vaitarna, Elunuthi Mangalam on River Noyyal, Lakshmanapatti on River Kodaganar, Luwara on River Shetrunji and Thevur River Sarabenga. In 2024, Eleven (11) water quality monitoring stations - B.P.M. (Bamni) on River Wardha, Dadri on River Sahibi, Dhalegaon on Godavari, Dhansa on Sahibi, Elunuthi mangalam on River Noyyal, Lakshmanapatti on River Kodaganar, Luwara on River Shetrunji, T. Ramapuram on River Hagari, Thevur on River

Sarabenga, Varanavasi on River Marudaiyar and Vautha on River Sabarmati - exceeded the conductivity of 2250 µS/cm during the pre-monsoon, monsoon, and post-monsoon seasons. To compare the hotspot water quality stations of 2023 and 2024, four water quality stations - B.P.M. (Bamni) on River Wardha, Lakshmanapatti on River Kodaganar, Luwara on River Shetrunji and Thevur on River Sarabenga - were identified as common hotspot stations during both years.

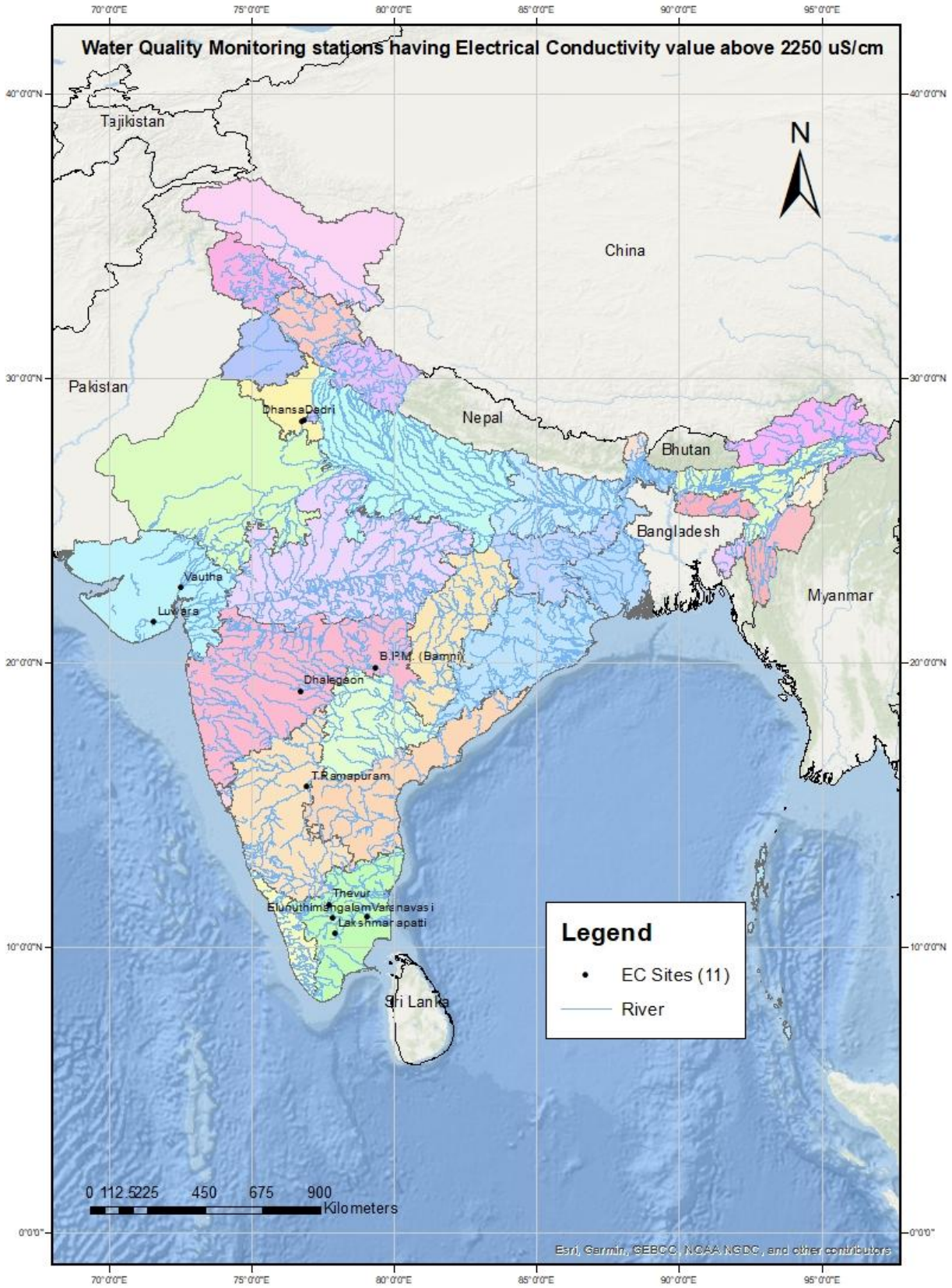
The hot spot study and GIS map for EC parameter are given below in Table 9 and figure 18.

Table 9: Monitoring stations having Electrical Conductivity (EC) >2250 µS/cm in River Water 2024

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	B.P.M. (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	5110	4142	3507
2	Dadri	Sahibi	UYD, Delhi	Haryana	Dadri	*	2407	*
3	Dhalegaon	Godavari	UGD, Hyderabad	Maharashtra	Parbhani	2810	-	-
4	Dhansa	Sahibi	UYD, Delhi	Haryana	Jhjjar	*	2776	*
5	Elunuthimangalam	Noyyal	SRD, Coimbatore	Tamil Nadu	Erode	3336	2618	2335
6	Lakshmanapatti	Kodaganar	SRD, Coimbatore	Tamil Nadu	Dindigul	2639	3010	3098
7	Luwara	Shetrunji	MD, Gandhinagar	Gujarat	Bhavnagar	8576	-	2382
8	T. Ramapuram	Hagari	LKD, Hyderabad	Karnataka	Bellary	2590	-	-
9	Thevur	Sarabenga	SRD, Coimbatore	Tamil Nadu	Salem	2457	-	-
10	Varanavasi	Marudaiyar	SRD, Coimbatore	Tamil Nadu	Perambalur	-	*	2586
11	Vautha	Sabarmati	MD, Gandhinagar	Gujarat	Ahmedabad	2415	-	-

(-) means No Hotspot;
(*) means Data not available/ river dry.

Figure 18: Water Quality Monitoring stations having electrical Conductivity value greater than 2250 µmhos/cm (2024)



7.1.3 Ammonia as N (NH_3-N)

The primary agricultural sources include leaching of ammonia-rich fertilizer and transport to surface water and livestock waste. The limit prescribed by CPCB for Ammonia (as N) in class-D: Propagation of Wild life and Fisheries is 1.2 mg/l or less.

Ammonia levels as N during the pre-monsoon, monsoon and post-monsoon seasons show significant variability across the monitored sites. In 2024, the lowest recorded ammonia level as N among hotspots was 1.30 mg/L (Mawi, Yamuna, Uttar Pradesh), while the highest recorded level was 36.83 mg/L (KT(Satrapur), Kanhan River, Maharashtra). Throughout the study period, 47 water quality stations at 22 rivers (Agra Canal, Arkavathy, Betwa, Bhima, Brahamani, Damodar, Dhadhar, Dudhnai, Ganga, Gumti, Hindon, Hindon Cut, Kali, Kaliyar, Kanhan, Kim, Ponnaiyar, Sabarmati, Shipra, Sina, Wardha and Yamuna) exceeded the acceptable limit of ammonia as N.
During the pre-monsoon season, the levels of ammonia as N range from 1.33 mg/L at Hathikhana (on River Ganga, Uttar Pradesh) to 36.83 mg/L (KT (Satrapur), Kanhan River, Maharashtra). This wide range reflects the diverse nature of rivers, with 32 sites exceeding the acceptable limit. In the monsoon season, the levels of ammonia as N range from 1.31 mg/L at Kalpi (Ymauna River, Uttar Pradesh) to 32.41 mg/L at Singasadanapalli (Ponnaiyar River, Tamil Nadu). During monsoon season, 32 sites still exceed the acceptable limit. Similarly, during the post-monsoon season, the levels of ammonia as N range from 1.30 mg/L at Mawi (Yamuna River, Uttar Pradesh) to 28.98 mg/L at Singasadanapalli (Ponnaiyar River, Tamil Nadu), with 36 sites exceeding the acceptable limit.

Comparision between 2023 & 2024:

In both 2023 and 2024, concerning water quality, alarming trends of ammonia were observed across various rivers. In 2023, 42 water quality monitoring stations along 20 rivers, such as Agra Canal, Arpa, Bearma, Bhima, Brahmani, Dhadhar, Hindon, Hindon Cut, Kanhan, Kharkai, Kodaganar, Koel, Mula-Mutha, Ponnaiyar, Sabarmati, Sahibi, Sina, Wardha, Watrak and Yamuna, exceed the established threshold for Ammonia concentration at 1.2 mg/L.The following year, in 2024, the issue persisted and intensified, with 47 water quality monitoring stations along the 22 rivers (Agra Canal, Arkavathy, Betwa, Bhima, Brahamani, Damodar, Dhadhar, Dudhnai, Ganga, Gumti, Hindon, Hindon Cut, Kali, Kaliyar, Kanhan, Kim, Ponnaiyar, Sabarmati, Shipra, Sina, Wardha and Yamuna, exceeding the established threshold for Ammonia concentration at 1.2 mg/L.

The comparison of ammonia hot spots between 2023 and 2024 reveals

significant trends across the different seasons: Pre-Monsoon, Monsoon, and Post-Monsoon.

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Ammonia-N		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	42	33	32	21
2024	47	32	32	36

22 water quality monitoring stations were identified as common hotspots in the years 2023 and 2024. These monitoring stations are located on 11 rivers, namely Ponnaiyar, Kanhan, Bhima, Brahamani, Dhadhar, Hindon, Hindon Cut, Sina, Sabarmati, Wardha and Yamuna. They consistently showed elevated ammonia levels beyond the acceptable limit of 1.2 mg/L. The primary contributors to this issue were identified as industrial discharges, agricultural runoff, and urban wastewater. Untreated or inadequately treated effluents released from industrial activities, along with urban areas contributing to increased ammonia levels, were found to be significant factors impacting the water quality of these rivers.

The hot spot study and GIS map for ammonia-N (NH_3-N) are given below in Table 10 and figure 19.

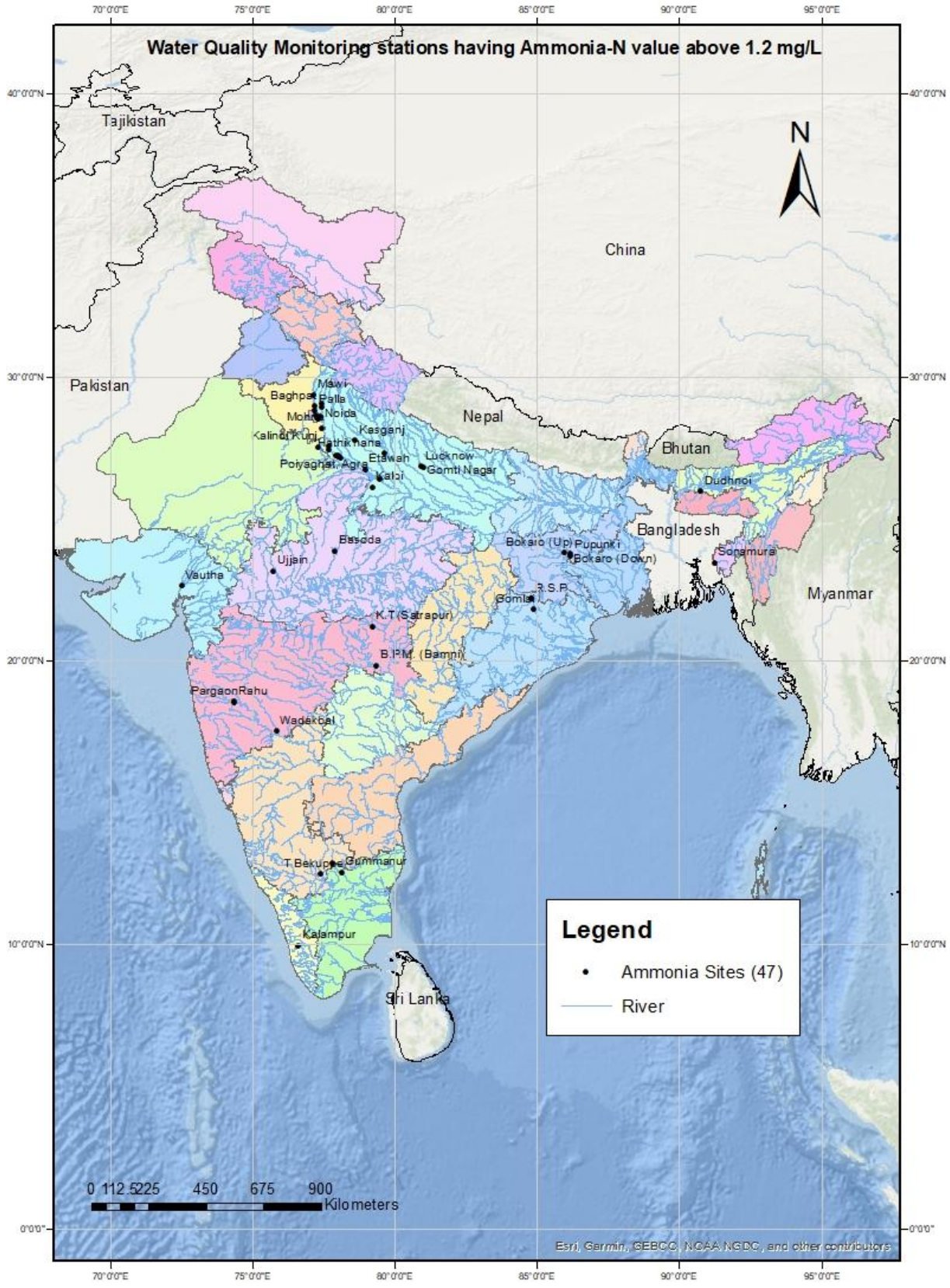
Table 10: Monitoring stations having Ammonia as N (NH_3-N) > 1.2 mg/l in River Water in 2024

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	Auraiya	Yamuna	LYD, Agra	Uttar Pradesh	Auraiya	1.46	-	-
2	B.P.M. (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	8.38	2.77	4.39
3	Baghpat	Yamuna	UYD, Delhi	Uttar Pradesh	Baghpat	-	-	2.50
4	Baleni	Hindon	UYD, Delhi	Uttar Pradesh	Baghpat	4.35	1.31	-
5	Basoda	Betwa	LYD, Agra	Madhya Pradesh	Vidisha	-	-	1.34
6	Bokaro (Down)	Garga	DD, Asansol	Jharkhand	Bokaro	11.31	4.15	2.28
7	Bokaro (Up)	Garga	DD, Asansol	Jharkhand	Bokaro	11.21	4.18	2.28
8	Chilla Gaon	Hindon Cut	UYD, Delhi	Delhi	East Delhi	8.30	7.19	7.29
9	Delhi Railway Bridge	Yamuna	UYD, Delhi	Delhi	North Delhi	15.56	7.24	10.62
10	Dudhnoi	Dudhnai	MBD, Guwahati	Assam	Goalpara	-	1.44	-
11	Etawah	Yamuna	LYD, Agra	Uttar Pradesh	Etawah	6.34	1.62	3.80
12	Galeta	Hindon	UYD, Delhi	Uttar Pradesh	Meerut	6.69	2.09	3.11
13	Gokul barrage Mathura D/S	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	15.17	5.51	11.38
14	Gomlai	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	-	-	1.62
15	Gomti Nagar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	1.48	-	-
16	Gummanur	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	4.64	1.86	3.06
17	Hathikhana	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehgarh	1.33	-	-
18	Jawahar Bridge, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	11.71	4.13	7.61
19	K.T.(Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	36.83	18.90	25.02
20	Kailash Mandir, (Agra U/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	11.84	3.14	8.19
21	Kalampur	Kaliyar	SWRD, Kochi	Kerala	Ernakulam	-	-	5.03
22	Kalindi Kunj	Agra Canal	UYD, Delhi	Delhi	East Delhi	14.80	7.33	8.75
23	Kalpi	Yamuna	LYD, Agra	Uttar Pradesh	Jalaun	-	1.31	-
24	Kasganj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kasganj	1.90	-	-
25	Lucknow	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	1.40	-	-
26	Mawi	Yamuna	UYD, Delhi	Uttar Pradesh	Muzaffar Nagar	-	-	1.30
27	Mohna	Yamuna	UYD, Delhi	Haryana	Faridabad	15.49	7.87	10.76
28	Motinaroli	Kim	TD, Surat	Gujarat	Surat	-	-	1.74
29	Noida	Hindon	UYD, Delhi	Uttar Pradesh	Gautam Budh Nagar	14.42	7.49	4.25
30	Okhla barrage	Yamuna	UYD, Delhi	Delhi	South Delhi	13.80	8.49	8.84
31	Palla	Yamuna	UYD, Delhi	Delhi	North West Delhi	-	-	2.56
32	Pargaon	Bhima	UKD, Pune	Maharashtra	Pune	*	1.94	*
33	Pingalwada	Dhadhar	TD, Surat	Gujarat	Vadodara	4.62	2.50	2.54
34	Poiyaghat, Agra	Yamuna	LYD, Agra	Uttar	Agra	11.03	2.95	6.60

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
				Pradesh				
35	Pupunki	Damodar	DD, Asansol	Jharkhand	Bokaro	*	-	1.95
36	R.S.P	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	9.69	5.06	12.06
37	R.S.P-I	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	4.08	6.01	5.14
38	R.S.P-II	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	2.14	5.45	2.06
39	Rahu	Bhima	UKD, Pune	Maharashtra	Pune	*	3.19	*
40	Singasadanapalli	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	25.48	32.41	28.98
41	Sonamura	Gumti	MD, Silchar	Tripura	Sepahijala	2.59	-	-
42	T Bekuppe	Arkavathy	CD, Bengaluru	Karnataka	Ramanagara	*	16.46	12.86
43	Ujjain	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	3.58	4.96
44	Vautha	Sabarmati	MD, Gandhinagar	Gujarat	Ahmedabad	4.94	5.14	4.85
45	Vrindawan Bridge (Mathura U/S)	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	15.83	5.61	11.15
46	Wadakbal	Sina	UKD, Pune	Maharashtra	Solapur	*	-	1.36
47	Yamuna Expressway Road Bridge, Etamadpur (Agra D/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	13.19	4.77	6.24

(-) means No Hotspot
(*) means Data not available/ river dry.

Figure 19: Water Quality monitoring stations having ammonia as N value above 1.2 mg/L (2024)



7.1.4 Fluoride (F^-)

BIS has recommended 1.0 mg/l of F as desirable concentration of fluoride in drinking water, which can be extended to 1.5 mg/l of fluoride in case no alternative source of water is available. During the pre-moonsson, monsoon and post monsoon seasons, the fluoride concentrations observed at only one (01) water quality monitoring at Lingdem Hot Spring (Talang Chu River) station exceeded the acceptable limit.

Lingdem Hot Spring (Talang Chu River) has a slight variation in fluoride concentration from pre-monsoon (5.17 mg/L) to monsoon (5.01 mg/L— exceeded the acceptable fluoride concentration.

Comparision between 2023 & 2024:

In the years 2023 and 2024, an investigation into fluoride concentrations at various water quality monitoring stations revealed notable findings. During 2023, six (06) monitoring stations namely Kamalapuram (Papagani), Lakshmanapatti (Kodaganar), Lingdem (HS) (Talangchu), R.S.P (Brahmani), R.S.P-1 (Brahmani) and Tadipatri (Pennar) surpassed the acceptable limits for fluoride concentrations. But, in 2024, only one (01) water quality monitoring at Lingdem Hot Spring (Talang Chu River) station recorded fluoride levels above the permissible thresholds.

The comparison of fluoride hot spots between 2023 and 2024 reveals significant trends across the different seasons: Pre-Monsoon, Monsoon and Post-Monsoon.

YEAR	Total No. of Hotspots found	Number of Hot-Spots Found for fluoride		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	6	5	1	2
2024	1	1	1	*

In both 2023 and 2024, one water quality monitoring station was consistently identified: at Lingdem Hot Spring (Talang Chu River). The presence of fluoride in this location, Talang Chu (hot spring), is likely due to the leaching of fluoride-bearing minerals from rocks.

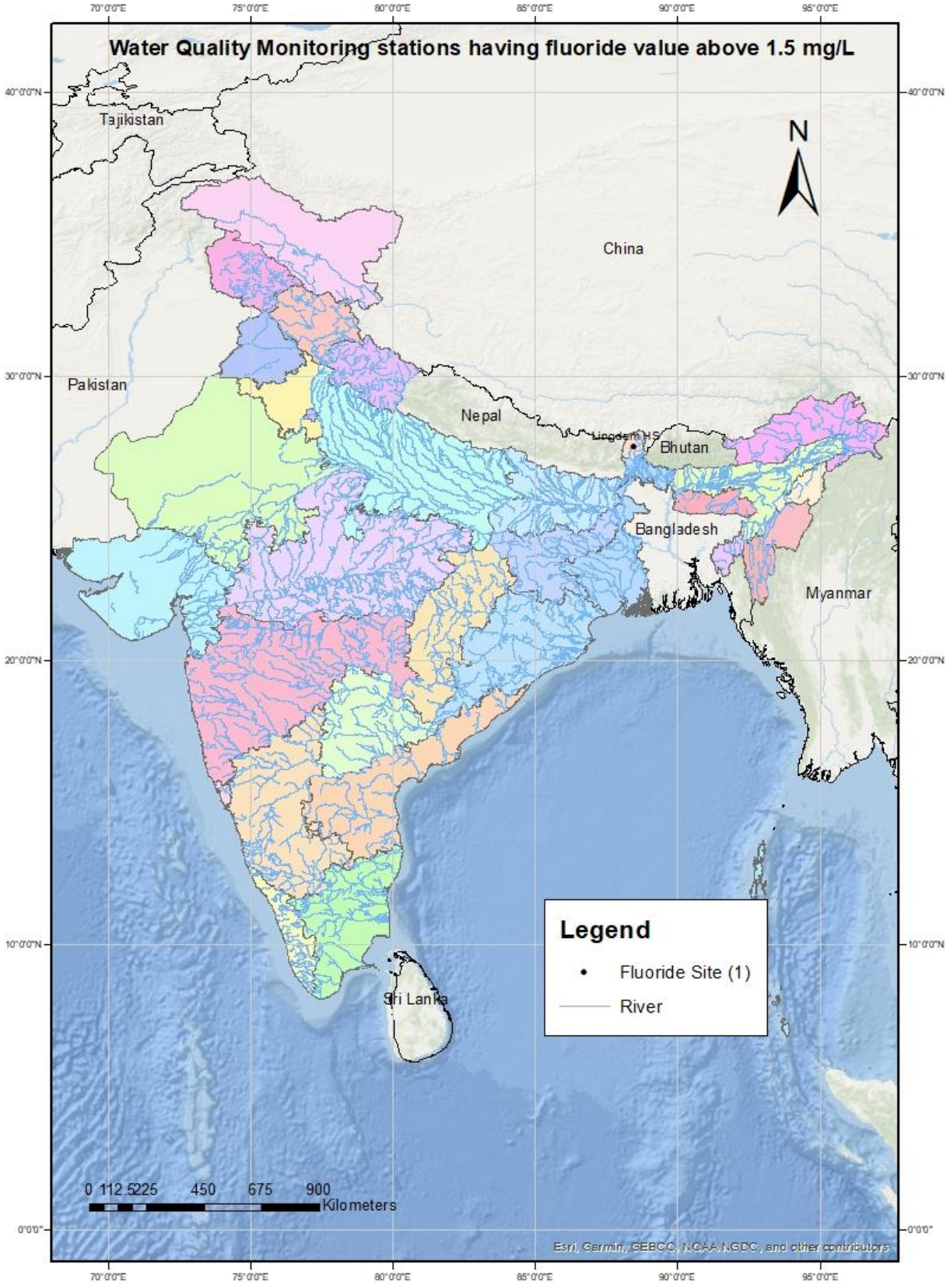
The hot spot study and GIS map for F^- parameter are given below in Table 11 and figure 20.

Table 11: Monitoring stations having Fluoride (F^-) concentration above 1.5 mg/l in River Water in 2024

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	Lingdem HS	Hot Spring/Talanchu	SID, Gangtok	Sikkim	Mangan	5.17	5.01	*

(*) means Data not available/ river dry.

Figure 20: Water Quality Monitoring stations having fluoride value above 1.5 mg/L (2024)



7.1.5 Total Hardness

The acceptable limit according to Indian Standard Drinking Water-Specification, IS 10500: 2012 is 200 mg/l and the permissible limit in the absence of alternate source is 600 mg/l. The water quality at four (04) stations, B.P.M. (Bamni) on the Wardha River, Dhansa on River Sahibi, Lakshmanapatti on Kodaganar River, and Luwara on Shetrunji River, exceeded the acceptable hardness limit during the pre-monsoon, monsoon, and post-monsoon seasons. The minimum hardness value of 636 mg/L was recorded during the pre-monsoon season at B.P.M. (Bamni) on the Wardha River, while the maximum value of 839 mg/L was recorded during the pre-monsoon season at Luwara on Shetrunji River. The persistent exceedance of acceptable hardness levels, due to the presence of minerals like calcium and magnesium in the water, can have adverse effects on various industrial, agricultural, and domestic activities.

Comparision between 2023 & 2024:

In 2023 and 2024, an investigation into total hardness concentrations at various water quality monitoring stations revealed significant findings. In 2023, three (03) water quality monitoring stations, namely B.P.M. (Bamni) on the Wardha River Maharasthra, Lakshmanapatti on the Kodaganar River Tamil nadu, and Luwara on the Shetrunji River Gujrat, showed total hardness values above the permissible limit of BIS 10500:2012 for the pre-monsoon, monsoon and post-monsoon seasons. Similarly, in 2024, four (04) stations, specifically B.P.M. (Bamni) on the Wardha River, Dhansa on Sahibi River, Lakshmanapatti on the Kodaganar River and Luwara on the Shetrunji River, recorded total hardness levels above the permissible thresholds.

The data presented summarizes the number of hot-spots identified for total hardness across different seasons for the years 2023 and 2024. The results are detailed in the table below:

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Total Hardness		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	3	3	1	2
2024	4	2	3	-

In 2023, there were 3 hotspots for total hardness during the pre-monsoon season. In 2024, this number increased to 2. In 2023, in the monsoon season, one hotspot was recorded but in 2024 were 3. Notably, there were

no identified hotspots during the post-monsoon season in 2024, whereas in 2023 were 2. Three water quality monitoring stations were commonly identified in both 2023 and 2024: B.P.M. (Bamni) (Wardha River) in Maharashtra, Lakshmanapatti on the Kodaganar River Tamil nadu and Luwara (Shetrunji River) in Gujarat.

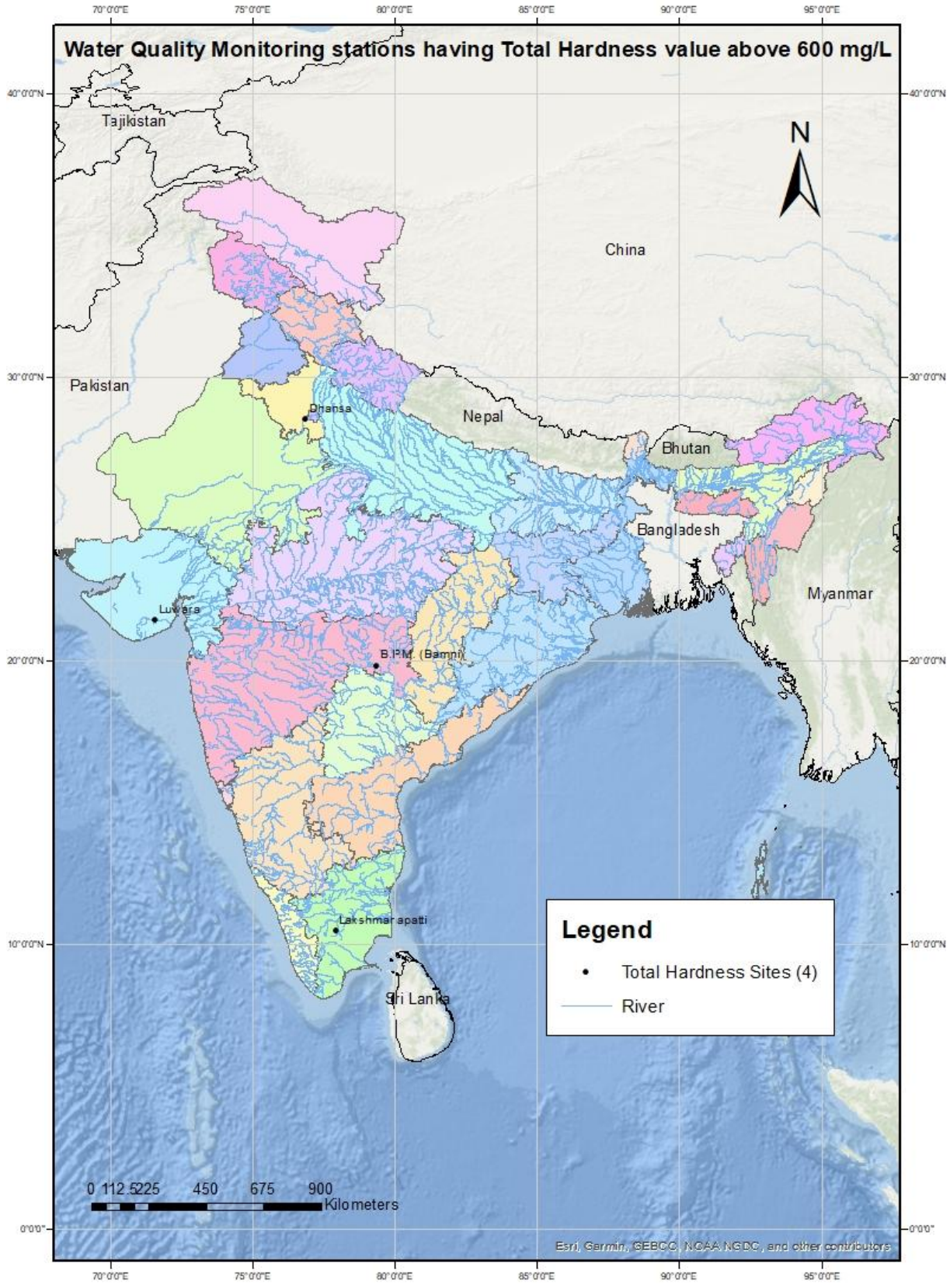
The hot spot study and GIS map for total hardness (TH) parameter are given below in Table 12 and figure 21.

Table 12: Monitoring stations having Total hardness (TH) concentration above 600 mg/l in River Water in 2024

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	B.P.M. (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	635.7	647.5	-
2	Dhansa	Sahibi	UYD, Delhi	Haryana	Jhjjar	*	626.2	*
3	Lakshmanapatti	Kodaganar	SRD, Coimbatore	Tamil Nadu	Dindigul	-	603.9	-
4	Luwara	Shetrunji	MD, Gandhinagar	Gujarat	Bhavnagar	838.6	-	-

(-) means No Hotspot.
(*) means Data not available/ river dry.

Figure 21: Water Quality Monitoring stations having total hardness value above 600 mg/L (2024)



7.1.6 Chloride (Cl^-)

Chloride is a major inorganic anion found in water and wastewater. It occurs naturally in all types of water and the salty taste it produces varies depending on the water's chemical composition. According to the Indian Standard Drinking Water-Specification, IS 10500: 2012, the acceptable limit for chloride is 250 mg/l, and the permissible limit in the absence of an alternate source is 1000 mg/l. Some waters containing 250 mg Cl^-/L may have a detectable salty taste, especially if the cation is sodium. Conversely, water containing as much as 1000 mg/l may not have a typical salty taste if another element is predominant.

In 2024, only one (01) water quality station Luwara (Shetrunji river) - exceeded the permissible limit of 1000 mg/L for chloride

At the Luwara station along the Shetrunji River in Gujarat, the highest chloride concentrations 2613 mg/l was observed in the pre-monsoon seasons only, indicating severe contamination levels. However, the data indicated a significant decrease in water quality from 2613 mg/L during the pre-monsoon season to within limit during the monsoon season and post monsoon, which may be attributed to addition of water.

Comparision between 2023 & 2024:

The comparison of chloride hot spots between 2023 and 2024 reveals significant trends across the different seasons: Pre-Monsoon, Monsoon and Post-Monsoon.

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Chloride		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	3	2	2	1
2024	1	1	-	-

During 2023, three (03) water quality stations - Durvesh (Vaitarna river), Lakshmanapatti (Kodaganar river), and Luwara (Shetrunji river) - exceeded the permissible limit of 1000 mg/L for chloride. Luwara (Shetrunji River) in Gujarat was the only station identified as a hotspot in both 2023 and 2024. High chloride levels often indicate the presence of industrial effluents, agricultural runoff, or urban waste, which pose risks to aquatic ecosystems and public health.

The water quality with respect to chloride in 2024 increased in study area as compared to 2023.

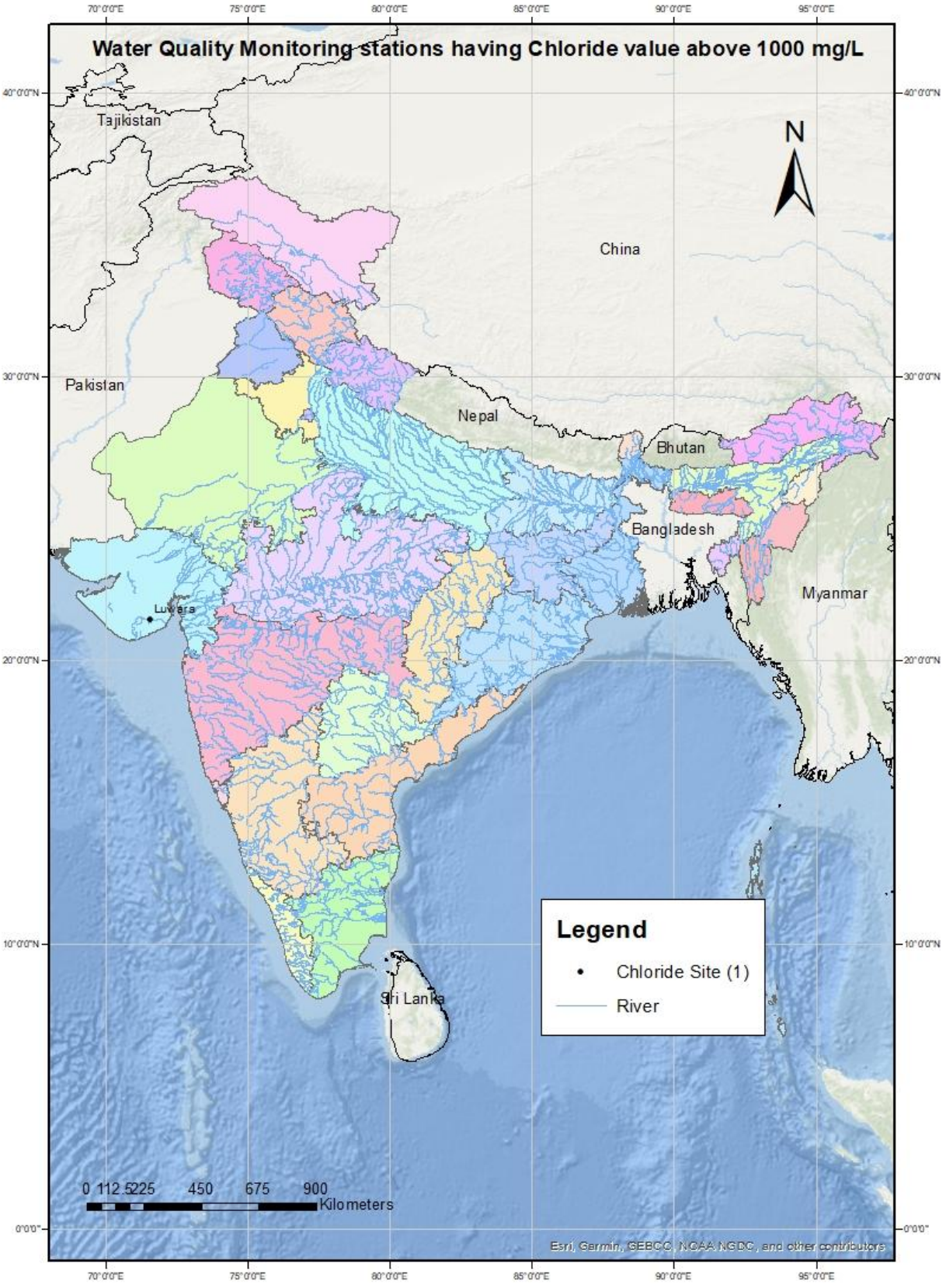
The hot spot study and GIS map for chloride (Cl^-) are given below in Table 13 and figure 22.

Table 13: Monitoring stations having Chloride (Cl^-) > 1000 mg/l in River Water in 2024

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	Luwara	Shetrunji	MD, Gandhinagar	Gujarat	Bhavnagar	2613.3	-	-

(-) means No Hotspot

Figure 22: Water Quality Monitoring stations having chloride value above 1000 mg/L (2024)



7.1.7 Boron (B)

Boron is a chemical element that is found in the earth's crust and is crucial for various natural and industrial processes. It is naturally present in fruits, vegetables, and water sources, often forming compounds known as borates. These compounds, including borax and boric acid, are widely used in the manufacturing of glass, ceramics, soaps, detergents, cosmetics, medications, and pesticides. Boron is typically a minor component of river water. It is considered an essential micronutrient for plants and also shows indications of being vital for animals and humans. Boron enters the environment through natural processes such as weathering of soils and rocks, as well as human activities like glass manufacturing and coal-burning power plants.

The Central Pollution Control Board (CPCB) sets a limit of 2 mg/l for boron in specific classes, including irrigation and industrial cooling. The limit prescribed by CPCB for Boron (B) in class-E: Irrigation, Industrial Cooling, Controlled Waste disposals is not greater than 2 mg/l. Monitoring stations during pre-monsoon, monsoon and post-monsoon seasons consistently report average boron values within the permissible limit, highlighting efforts to manage and control boron levels in various water sources.

7.1.8 Nitrate as N (NO_3^--N)

Nitrate as N concentration showed significant variation across different seasons at the monitored sites.
In 2024, the the lowest nitrate concentration (among hotspots values) of 10.19 mg/L was observed at the Malkhed on River Bhima, while the highest concentration of 38.53 mg/L was recorded at the Koggedoddi water quality station on River Arkavathi. A total of 22 water quality stations at 21 rivers exceeded the nitrate concentration in 2024. In River Hemavathi, Suvarnavathi, Haridra, Malaprabha, Ghataprabha, Ponnaiyar, Tungabhadra, "Cauvery/ Lakshmanthirth, Vedavathi, Arkavathi, Cauvery, Kumudvathi, Wyra, Bhima, Varada, Edduvagu, Purna, Shimsha, Kabini, Musi and Krishna exceeded the nitrate concentration.

During pre-monsoon total five (05) Hot-Spots found where nitrate value among the hot-spots average was 10.19 mg/l at the Malkhed on River Bhima Karnatka which varies to maximum value 14.13 mg/l Gummanur on River Ponnaiyar Tamilnadu. In monsoon total five (05) Hot-Spots found where Nitrate concentration varies from 12.62 mg/l at Gummanur on River Ponnaiyar Tamilnadu to 30.20 mg/l at Koggedoddi on River Arkavathi Karnataka. In post Monsoon total seventeen (17) Hot-Spots found where average nitrate Values varies from 10.55 mg/l at Byaladahalli on River HARIDRA to 38.53 mg/l Koggedoddi on River Arkavathi.

Comparision between 2023 & 2024:

In 2023, the lowest nitrate concentration (among hotspots values) of 10.30 mg/L was observed at the Jamtara WQ station on River Ajoy, while the highest concentration of 23.04 mg/L was recorded at the Hanskhali WQ station on River Churni/Bhagirathi. A total of 42 water quality stations at 27 rivers exceeded the nitrate concentration in 2023. These rivers included Ajoy, Arkavathy, Badanadi, Bhagirathi, Bhima, Brahmani, Churni/Bhagirathi, Edduvagu, Feeder Canal, Ganga, Garga, Gomti, Hoogly/Bhagirathi, Jalangi/Bhagirathi, Kharkai, Krishna, Mathabhanga/Bhagirathi, Munneru, Musi, Ponnaiyar, Purna, Ramganga, Rushikulya, Sarada, Subarnarekha, Sukheta, and Wyra.
In 2024, 22 water quality stations at 21 rivers Hemavathi, Suvarnavathi, Haridra, Malaprabha, Ghataprabha, Ponnaiyar, Tungabhadra, "Cauvery/ Lakshmanthirth, Vedavathi, Arkavathi, Cauvery, Kumudvathi, Wyra, Bhima, Varada, Edduvagu, Purna, Shimsha, Kabini, Musi and Krishna exceeded the nitrate concentration.

The comparison of nitrate-nitrogen (N) hot-spots between 2023 and 2024 highlights significant trends across different seasons, summarized in the table below:

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Nitrate-N		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	42	1	35	18
2024	22	6	5	17

The comparison of the number of hotspots in all seasons between 2023 and 2024 indicates an improving trend in water quality. Six (06) water quality stations, namely Gummanur, Koggedoddi, Madhira, Munugodu, Purna and T Bekuppe, are located along Six (06) rivers (Ponnaiyar, Arkavathi, Wyra, Edduvagu, Purna and Arkavathi) and were identified as common hotspot stations between 2023 and 2024.

The hot spot study and GIS map for nitrate as N (NO_3^-N) are given below in Table 14 and figure 23.

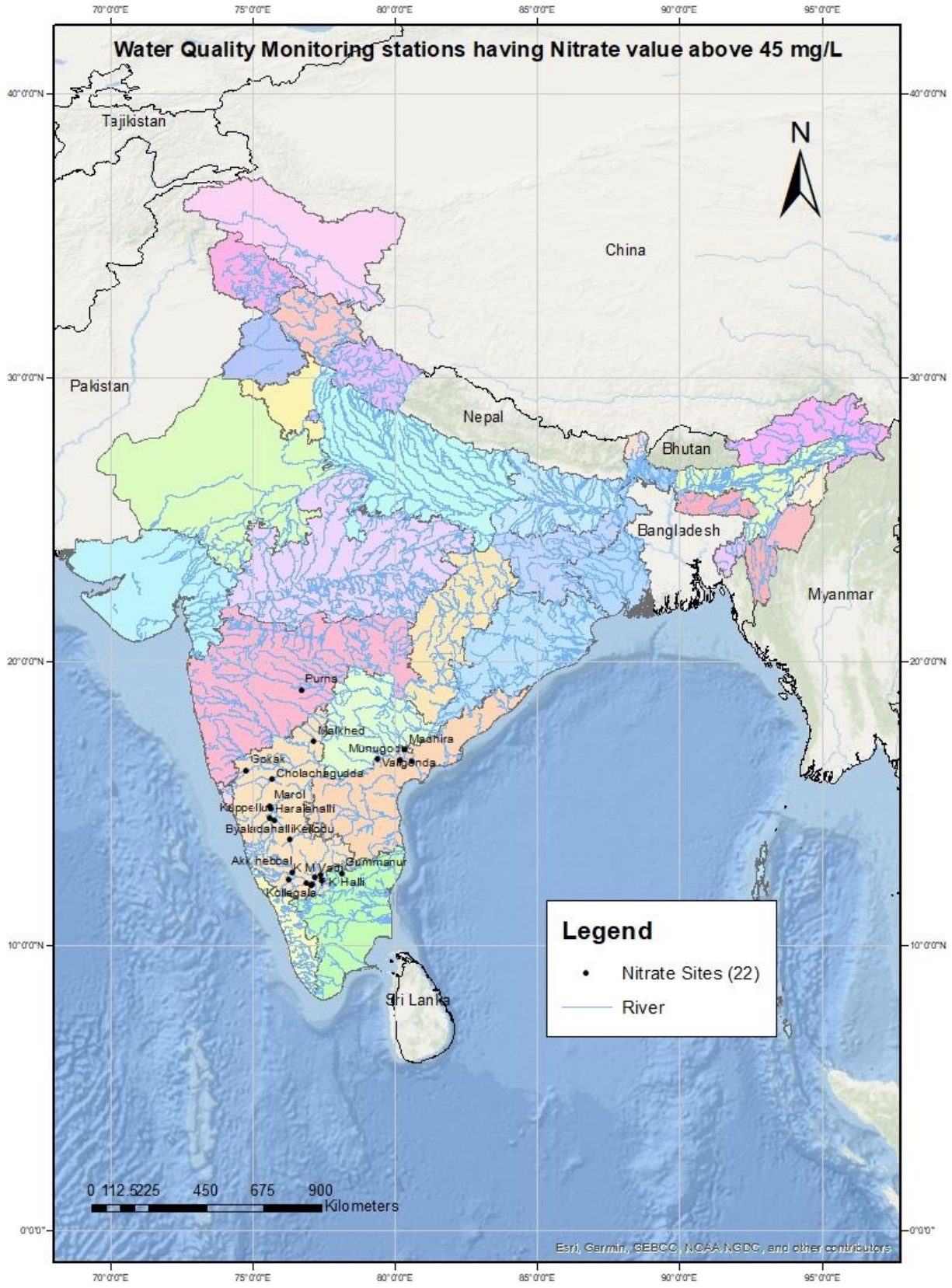
Table 14: Monitoring stations having Nitrate as N (NO_3^--N) > 10.16 mg/l (45mg/l as Nitrate) in River Water in 2024

S.No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	Akkihebbal	Hemavathi	CD, Bengaluru	Karnataka	Mandya	*	-	10.60
2	Bendrahalli	Suvarnavathi	CD, Bengaluru	Karnataka	Chamaraja Nagar	*	-	18.28
3	Byaladahalli	Haridra	CD, Bengaluru	Karnataka	Davanagere	*	-	10.55
4	Cholachagudda	Malaprabha	CD, Bengaluru	Karnataka	Bagalkot	*	26.03	28.17
5	Gokak	Ghataprabha	CD, Bengaluru	Karnataka	Belgaum	*	-	22.97
6	Gummanur	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	14.13	12.62	12.54
7	Haralahalli	Tungabhadra	CD, Bengaluru	Karnataka	Haveri	*	-	14.63
8	K M Vadi	Cauvery/ Lakshmanthirth	CD, Bengaluru	Karnataka	Mysore	*	-	13.15
9	Kellodu	Vedavathi	CD, Bengaluru	Karnataka	Chitradurga	*	-	16.47
10	Koggedoddi	Arkavathi	CD, Bengaluru	Karnataka	Ramanagara	*	38.20	38.53
11	Kollegala	Cauvery	CD, Bengaluru	Karnataka	Chamaraja Nagar	*	-	12.00
12	Kuppellur	Kumudvathi	CD, Bengaluru	Karnataka	Haveri	*	-	18.58
13	Madhira	Wyra	LKD, Hyderabad	Telangana	Khammam	10.57	-	-
14	Malkhed	Bhima	LKD, Hyderabad	Karnataka	Gulbarga	10.19	-	-
15	Marol	Varada	CD, Bengaluru	Karnataka	Haveri		-	19.17
16	Munugodu	Edduvagu	LKD, Hyderabad	Andhra Pradesh	Guntur	12.45	-	-
17	Purna	Purna	UGD, Hyderabad	Maharashtra	Parbhani	10.48	-	-
18	T Bekuppe	Arkavathi	CD, Bengaluru	Karnataka	Ramanagara	*	18.88	23.53
19	T K Halli	Shimsha	CD, Bengaluru	Karnataka	Mandya	*	-	11.42
20	T Narsipura	Kabini	CD, Bengaluru	Karnataka	Mysore	*	-	14.73
21	Valigonda	Musi	LKD, Hyderabad	Telangana	Nalgonda	*	13.01	24.26
22	Vijayawada	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	10.35	-	-

(-) means No Hotspot

(*) means Data not available/ river dry.

Figure 23: Water Quality Monitoring stations having nitrate value above 45 mg/L (10.16 mg/L as Nitrate-N) (2024)



7.1.9 Dissolved Oxygen (DO)

Dissolved oxygen (DO) is a critical factor in maintaining the health of aquatic ecosystems, serving as a primary indicator when assessing the suitability of river water to support aquatic life. CPCB has recommended 5.0 mg/l or more concentration of dissolved oxygen for outdoor bathing in Class B. Water having DO below 5.0 mg/l concentration is not suitable for out-door bathing.

Dissolved oxygen level at one hundred fifty six (156) at eight six (86) rivers Agra Canal, Aradei, Arkavathy, Arpa, Baigul/Kicha, Baitarani, Baya, Betwa, Bhima, Brahamani, Burhabalanga, Burhi Rapti, Cauvery, Lakshmanthirth, Arasalar, Nandalar, Noolar, Puravidaiyanar, Thirumalairajanar, Vanjiyar, Chambal, Chinnar, Chittar, Dhadhar, Dhasan, Dindi, Edduvagu, Gambhiri, Ganga, Godavari, Gomti, Halia, Hindon, Hindon Cut, Kal, Kali, Kanhan, Kanijhari, Khannaut, Kharkai, Koel, Krishna, Kunwari, Kwano, Mahanadi, Mahendratanaya, Manjera, Munneru, Musi, Nagavali, Palar, Panchganga, Parwati, Pennar, Chitravathi, Kunderu, Sagileru, Ponnaiyar, Ramganga, Ramial, Rind, Rushikulya, Sabarmati, Sahibi, Sai, Saloni, Sankh, Sarabenga, Sarada, sarayan, Sengar, Shipra, Sina, Subarnarekha, Sukheta, Suvarnavathi, Tambraparani, Tunga, Tungabhadra, Ulhas, Vaigai, Vaippar, Vamsadhara, Wardha, Wyra and Yamuna found below 5 mg/L.

In the pre - monsoon season, 98 water quality monitoring stations on 86 rivers in 18 states Madhya Pradesh, Jharkhand, Andhra Pradesh, Odisha, Tamil Nadu, Uttar Pradesh, Maharashtra, Bihar, Karnataka, Delhi, Rajasthan, Haryana, Telangana, Chhattisgarh, West Bengal, Puducherry, Gujarat, Uttarakhand recorded average DO values below 5.0 mg/l. In the monsoon season 102 water quality stations across 15 states Madhya Pradesh, Andhra Pradesh, Tamil Nadu, Uttar Pradesh, Maharashtra, Odisha, Delhi, Rajasthan, Haryana, Telangana, West Bengal, Jharkhand, Gujarat, Uttarakhand and Karnataka reporting average DO values below 5.0 mg/l. Finally, in the post-monsoon season, 57 water quality monitoring stations on 40 rivers across 14 states Tamil Nadu, Maharashtra, Bihar, Uttar Pradesh, Delhi, Telangana, Karnataka, Haryana, Puducherry, Andhra Pradesh, Gujarat, Odisha and Uttarakhand recorded average DO values below 5.0 mg/l.

Comparision between 2023 & 2024:

The comparison of dissolved oxygen (DO) hot-spots between 2023 and 2024 highlights significant trends across different seasons, summarized in the table below:

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Dissolved Oxygen		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	115	86	99	62
2024	156	98	102	57

Overall, this comparative analysis highlights the fact that although there is an increase in the number of water quality monitoring stations reporting low DO levels during all seasons of 2024, the situation appears to be deteriorating the water quality of rivers throughout the year.

The hot spot study and GIS map for dissolved oxygen (DO) parameter are given below in Table 15 and figure 24.

Table 15: Monitoring stations having Dissolved Oxygen (DO) < 5.0 mg/l in River Water in 2024

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	A.B. Road Crossing	Parwati	CD, Jaipur	Madhya Pradesh	Guna	*	4.28	*
2	Adityapur	Kharkai	ERD, Bhubaneswar	Jharkhand	Purba Singhbhum	4.24	-	-
3	Alladupalli	Pennar/Kunderu	HD, Chennai	Andhra Pradesh	Kadapa	-	4.95	-
4	Altuma	Ramial	ERD, Bhubaneswar	Odisha	Dhenkanal	4.77	-	-
5	Anakapali	Sarada	ERD, Bhubaneswar	Andhra Pradesh	Visakhapatnam	4.46	-	-
6	Anandapur	Baitarani	ERD, Bhubaneswar	Odisha	Keonjhar	4.83	-	-
7	AP Puram	Chittar	SRD, Coimbatore	Tamil Nadu	Tirunelveli	2.57	*	-
8	Aradei	Aradei	ERD, Bhubaneswar	Odisha	Keonjhar	4.25	-	-
9	Arcot	Palar	HD, Chennai	Tamil Nadu	Ranipet	-	3.89	4.60
10	Auraiya	Yamuna	LYD, Agra	Uttar Pradesh	Auraiya	-	4.24	-
11	B.P.M. (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	3.00	3.57	4.43
12	Bachhwara	Baya	LGD-1, Patna	Bihar	Begusarai	*	-	4.84
13	Badlapur	Ulhas	UKD, Pune	Maharashtra	Thane	-	-	4.97
14	Baleni	Hindon	UYD, Delhi	Uttar Pradesh	Baghpat	0.78	1.16	1.00
15	Balighat	Burhabalanga	ERD, Bhubaneswar	Odisha	Balasore	4.51	-	-
16	Bareilly	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	-	4.73	-
17	Baripada	Burhabalanga	ERD, Bhubaneswar	Odisha	Mayurbhanj	4.58	4.77	-
18	Basti	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	4.12	3.10	-
19	Basti D/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	4.47	2.76	-
20	Basti U/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	-	4.30	-
21	Bawapuram	Tungabhadra	LKD, Hyderabad	Andhra Pradesh	Kurnool	2.93	-	-
22	Bendrahalli	Suvarnavathi	CD, Bengaluru	Karnataka	Chamaraja Nagar	4.87	-	-
23	Bhind	Kunwari	LYD, Agra	Madhya Pradesh	Bhind	-	4.41	-
24	Bhitaura	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehpur	3.82	-	-
25	Bido	Brahamani	ERD, Bhubaneswar	Odisha	Dhenkanal	4.23	-	-
26	Bolani	Brahamani	ERD, Bhubaneswar	Odisha	Sundargarh	4.36	4.82	-
27	Bonaigarh	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh/ Odisha	4.16	-	-
28	champua	Baitarani	ERD, Bhubaneswar	Odisha	Keonjhar	4.55	-	-
29	Chandrika Devi	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	-	4.47	-
30	Chilla Gaon	Hindon Cut	UYD, Delhi	Delhi	East Delhi	0.33	0.36	0.71
31	Chittorgarh	Gambhiri	CD, Jaipur	Rajasthan	Chittorgarh	*	3.74	*
32	Dabri	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Shajahanpur	3.68	3.43	4.96
33	Dadri	Sahibi	UYD, Delhi	Haryana	Dadri	*	1.97	*
34	Dameracherla	Musi	LKD, Hyderabad	Telangana	Nalgonda	2.37	4.39	4.91
35	Daund	Bhima	UKD, Pune	Maharashtra	Pune	*	4.69	*
36	Delhi Railway Bridge	Yamuna	UYD, Delhi	Delhi	North Delhi	0.09	1.44	0.28
37	Deongaon Bridge	Bhima	LKD, Hyderabad	Karnataka	Bijapur	*	-	4.64

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
38	Deosugur	Musi	LKD, Hyderabad	Karnataka	Raichur	4.97	-	-
39	Dhaneta	Baigul/Kicha	MGD-2, Lucknow	Uttar Pradesh	Moradabad	-	4.75	3.65
40	Dhansa	Sahibi	UYD, Delhi	Haryana	Jhjjar	*	3.21	*
41	Domuhani	Subarnarekha	ERD, Bhubaneswar	Jharkhand	Purba Singhbhum	4.87	-	-
42	Etawah	Yamuna	LYD, Agra	Uttar Pradesh	Etawah	4.02	2.71	4.61
43	Galeta	Hindon	UYD, Delhi	Uttar Pradesh	Meerut	0.70	1.37	0.00
44	Garrauli	Dhasan	LYD, Agra	Madhya Pradesh	Chhattarpur	-	4.97	-
45	Gatora-1	Arpa	MD, Burla	Chhattisgarh	Bilaspur	4.99	-	-
46	Gatora-2	Arpa	MD, Burla	Chhattisgarh	Bilaspur	4.85	-	-
47	GH.Rd. Bridge	Subarnarekha	ERD, Bhubaneswar	Jharkhand	Purba Singhbhum	4.99	-	-
48	Gokul barrage Mathura D/S	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	1.98	2.60	1.97
49	Gomlai	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	4.86	-	-
50	Gomti Nagar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	2.24	1.91	3.34
51	Gopiballavpur	Subarnarekha	ERD, Bhubaneswar	West Bengal	Paschim Midnapur/ West Bengal	4.42	4.97	-
52	Gopurajapuram	Cauvery/Puravidaiyanar	HD, Chennai	Tamil Nadu	Nagapattinam	-	3.90	4.50
53	Govindpur (NH-5)	Burhabalanga	ERD, Bhubaneswar	Odisha	Balasore	4.72	-	-
54	Gudari	Vamsadhara	ERD, Bhubaneswar	Odisha	Rayagada	4.42	-	-
55	Gummanur	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	2.96	2.29	3.65
56	Gunupur	Vamsadhara	ERD, Bhubaneswar	Odisha	Rayagada	3.95	-	-
57	Halia	Halia	LKD, Hyderabad	Telangana	Nalgonda	*	4.45	4.62
58	Hathikhana	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehgarh	4.84	-	4.97
59	Hogenakkal	Chinnar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	*	4.61	-
60	Huvinhedgi	Krishna	LKD, Hyderabad	Karnataka	Raichur	4.96	-	-
61	Indupur	Brahamani	ERD, Bhubaneswar	Odisha	Kendrapara	3.94	*	*
62	Irrukkankudi	Vaippar	SRD, Coimbatore	Tamil Nadu	Virudhunagar	4.03	*	3.20
63	Jamshedpur	Subarnarekha	ERD, Bhubaneswar	Jharkhand	Purba Singhbhum	4.93	4.75	-
64	Jamsolaghat	Subarnarekha	ERD, Bhubaneswar	Odisha	Mayurbhanj	4.12	-	-
65	Jaraikela	Koel	ERD, Bhubaneswar	Odisha	Sundergarh	4.40	4.88	-
66	Jawahar Bridge, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	4.03	3.12	3.74
67	K M Vadi	Cauvery/ Lakshmanthirth	CD, Bengaluru	Karnataka	Mysore	3.54	-	-
68	K.T.(Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	0.20	0.87	0.20
69	Kailash Mandir, (Agra U/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	4.94	2.63	3.11
70	Kalindi Kunj	Agra Canal	UYD, Delhi	Delhi	East Delhi	0.29	0.33	0.30
71	Kalpi	Yamuna	LYD, Agra	Uttar Pradesh	Jalaun	-	4.98	-
72	Kannauj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kannauj	-	-	4.39
73	Kasganj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kasganj	-	2.58	3.45
74	Kashinagar	Vamsadhara	ERD, Bhubaneswar	Odisha	Gajapati	4.28	-	-
75	Keesara	Munneru	LKD, Hyderabad	Andhra Pradesh	Krishna	*	4.85	-

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
76	Kenduapada	Kanijhari	ERD, Bhubaneswar	Odisha	Keonjhar	4.87	-	-
77	Keonjhar	Aradei	ERD, Bhubaneswar	Odisha	Keonjhar	3.69	*	*
78	Kodumudi	Cauvery	SRD, Coimbatore	Tamil Nadu	Erode	4.58	-	-
79	Kopergaon	Godavari	UGD, Hyderabad	Maharashtra	Ahmednagar	*	4.54	*
80	Kora	Rind	LYD, Agra	Uttar Pradesh	Fatehpur	-	4.83	-
81	Kulpatanga	Kharkai	ERD, Bhubaneswar	Jharkhand	Purba Singhbhum	3.80	-	-
82	Lalpur	Sengar	LYD, Agra	Uttar Pradesh	Kanpur Dehat	-	4.14	-
83	Lucknow	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	2.53	2.11	2.37
84	Lupungdhi	Subarnarekha	ERD, Bhubaneswar	Jharkhand	Saraikela kharsawan	4.34	-	-
85	Madhira	Wyra	LKD, Hyderabad	Telangana	Khammam	-	4.71	-
86	Mahidpur	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	4.35	*
87	Mangaon	Kal	UKD, Pune	Maharashtra	Raigad	*	-	4.60
88	Meliaputty	Mahendratanaya	ERD, Bhubaneswar	Andhra Pradesh	Srikakulam	4.55	4.59	*
89	Menangudi	Cauvery/Noolar	HD, Chennai	Tamil Nadu	Thiruvarur	-	4.06	3.68
90	Mohana	Betwa	LYD, Agra	Uttar Pradesh	Jalaun	-	4.82	-
91	Mohna	Yamuna	UYD, Delhi	Haryana	Faridabad	0.24	1.79	0.21
92	Moradabad	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Moradabad	2.99	3.71	-
93	Munugodu	Edduvagu	LKD, Hyderabad	Andhra Pradesh	Guntur	4.76	-	-
94	Murappanadu	Tambraparani	SRD, Coimbatore	Tamil Nadu	Tuticorin	4.86	-	-
95	Muri	Subarnarekha	ERD, Bhubaneswar	Jharkhand	Ranchi	4.36	-	-
96	Nallathur	Cauvery/Nandalar	HD, Chennai	Puducherry	Karaikal	-	-	4.32
97	Nanded	Godavari	UGD, Hyderabad	Maharashtra	Nanded	1.12	3.14	-
98	Nandipalli	Pennar/Sagileru	HD, Chennai	Andhra Pradesh	Kadapa	-	4.90	4.90
99	Nasik	Godavari	UGD, Hyderabad	Maharashtra	Nasik	2.86	2.56	1.93
100	Neemsar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Sitapur	-	4.51	-
101	Noida	Hindon	UYD, Delhi	Uttar Pradesh	Gautam Budh Nagar	0.02	0.87	0.79
102	Okhla barrage	Yamuna	UYD, Delhi	Delhi	South Delhi	0.25	0.58	0.45
103	Orai-Rath Marg, Chikasi (Sahijina U/S)	Betwa	LYD, Agra	Uttar Pradesh	Jalaun	-	4.98	-
104	Paleru Bridge	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	*	3.76	4.78
105	Palla	Yamuna	UYD, Delhi	Delhi	North West Delhi	-	4.39	-
106	Panposh	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	4.82	-	-
107	Panposh-I	Sankh	ERD, Bhubaneswar	Odisha	Sundergarh	4.90	-	-
108	Panposh-II	Koel	ERD, Bhubaneswar	Odisha	Sundergarh	4.88	4.67	-
109	Paramakudi	Vaigai	SRD, Coimbatore	Tamil Nadu	Ramanathapuram	3.90	4.89	-
110	Pargaon	Bhima	UKD, Pune	Maharashtra	Pune	*	4.39	*
111	Parsohan ghat	Burhi Rapti	MGD-1, Lucknow	Uttar Pradesh	Sidharthnagar	-	4.47	-
112	Peralam	Cauvery/Vanjiyar	HD, Chennai	Tamil Nadu	Thiruvarur	-	3.49	3.20

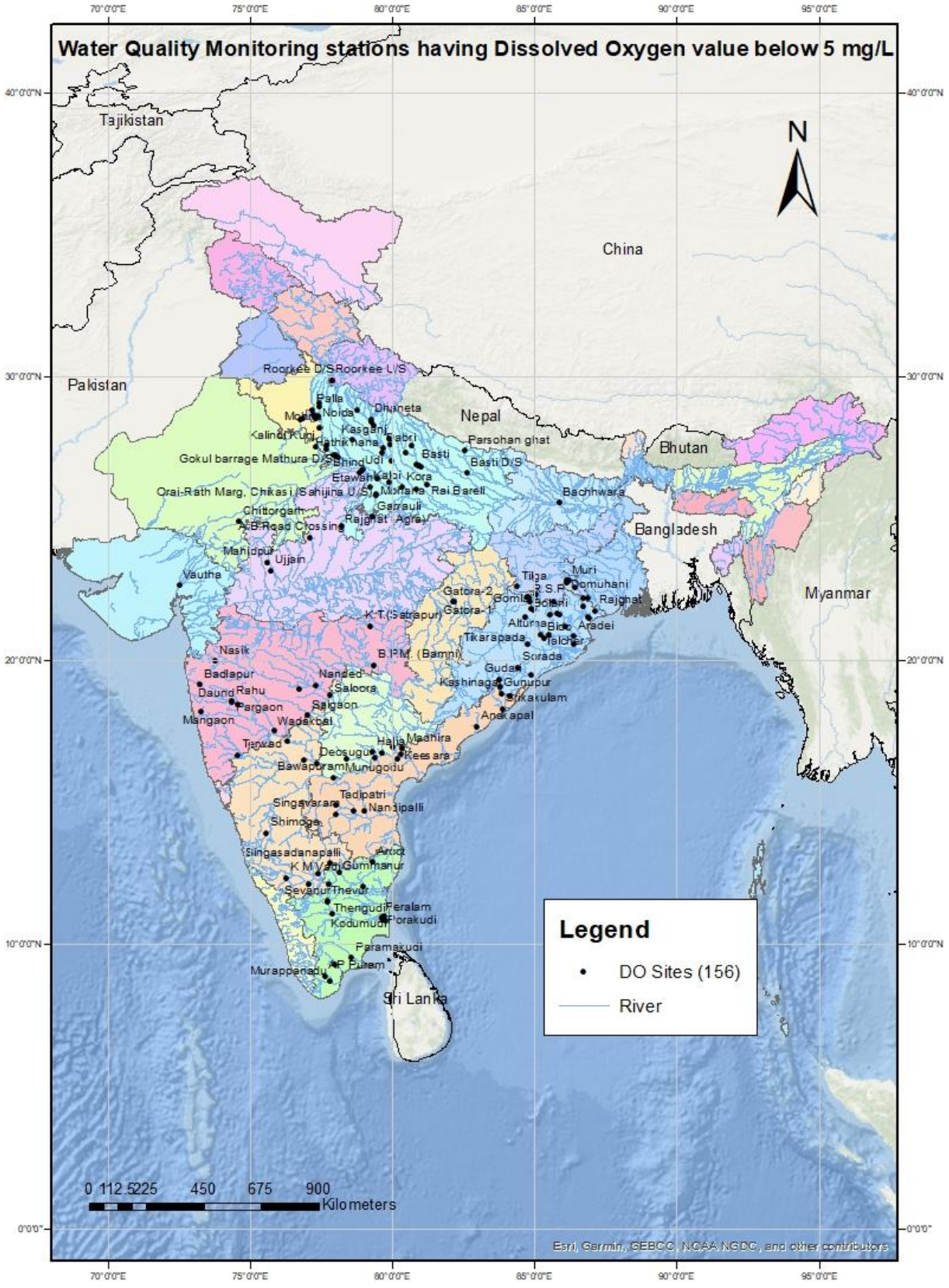
S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
113	Pingalwada	Dhadhar	TD, Surat	Gujarat	Vadodara	1.50	0.53	0.54
114	Poiyaghat, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	3.31	3.02	2.95
115	Porakudi	Cauvery/Arasalar	HD, Chennai	Tamil Nadu	Nagapattinam	-	4.36	-
116	Purashottampur	Rushikulya	ERD, Bhubaneswar	Odisha	Ganjam	4.31	-	-
117	Purunagarh	Brahamani	ERD, Bhubaneswar	Odisha	Deogarh/ Odisha	4.43	4.66	-
118	R.S.P	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	3.37	4.19	4.36
119	R.S.P-I	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	4.92	-	-
120	R.S.P-II	Brahamani	ERD, Bhubaneswar	Odisha	Sundergarh	4.55	4.97	-
121	Rahu	Bhima	UKD, Pune	Maharashtra	Pune	*	3.37	*
122	Rai Bareli	Sai	MGD-2, Lucknow	Uttar Pradesh	Rae Bareili	3.61	2.82	-
123	Rajghat	Subarnarekha	ERD, Bhubaneswar	Odisha	Mayurbhanj	4.42	4.64	-
124	Rajghat (Agra)	Betwa	LYD, Agra	Uttar Pradesh	Lalitpur	4.71	-	-
125	Roorkee D/S	Saloni	HGD, Haridwar	Uttarakhand	Haridwar	0.24	0.11	0.00
126	Roorkee U/S	Saloni	HGD, Haridwar	Uttarakhand	Haridwar	0.23	0.13	0.00
127	Saigaon	Manjera	UGD, Hyderabad	Karnataka	Bidar	*	4.64	-
128	Saloora	Godavari	UGD, Hyderabad	Telangana	Nizamabad	-	4.78	-
129	Sevanur	Chittar	SRD, Coimbatore	Tamil Nadu	Erode	*	3.47	4.22
130	Shahjahanpur	Khannaut	MGD-2, Lucknow	Uttar Pradesh	Shahjahanpur	3.98	3.63	4.75
131	Shimoga	Tunga	CD, Bengaluru	Karnataka	Shimoga	4.97	-	-
132	Singasadanapalli	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	0.00	0.00	0.00
133	Singavaram	Pennar/Chitravathi	HD, Chennai	Andhra Pradesh	Anantapur	*	4.80	*
134	Sitapur	sarayan	MGD-2, Lucknow	Uttar Pradesh	Sitapur	4.84	3.48	-
135	Sorada	Rushikulya	ERD, Bhubaneswar	Odisha	Ganjam	4.44	-	-
136	Srikakulam	Nagavali	ERD, Bhubaneswar	Andhra Pradesh	Srikakulam	4.31	4.97	4.88
137	Suddakallu	Dindi	LKD, Hyderabad	Telangana	Mahaboob Nagar	-	4.47	-
138	Swampatana	Baitarani	ERD, Bhubaneswar	Odisha	Keonjhar	4.82	-	-
139	T Bekuppe	Arkavathy	CD, Bengaluru	Karnataka	Ramanagara	1.98	2.38	3.45
140	Tadipatri	Pennar	HD, Chennai	Andhra Pradesh	Anantapur	*	4.33	*
141	Talcher	Brahamani	ERD, Bhubaneswar	Odisha	Angual	4.66	-	-
142	Terwad	Panchganga	UKD, Pune	Maharashtra	Kolhapur	*	3.94	3.60
143	Thengudi	Cauvery/Thirumalairajanar	HD, Chennai	Tamil Nadu	Thiruvarur	-	4.43	4.20
144	Thevur	Sarabenga	SRD, Coimbatore	Tamil Nadu	Salem	-	2.31	3.98
145	Tiharkhera	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	-	4.04	3.44

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
146	Tikarapada	Mahanadi	MD, Burla	Odisha	Angul	4.23	-	-
147	Tilga	Sankh	ERD, Bhubaneswar	Jharkhand	Simdega	4.42	-	-
148	Tondarpur	Sukheta	MGD-2, Lucknow	Uttar Pradesh	Hardoi	4.45	3.05	4.82
149	Udi	Chambal	LYD, Agra	Uttar Pradesh	Etawah	-	4.30	-
150	Ujjain	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	3.53	-
151	Valigonda	Musi	LKD, Hyderabad	Telangana	Nalgonda	0.64	0.93	1.00
152	Vautha	Sabarmati	MD, Gandhinagar	Gujarat	Ahmedabad	0.00	0.74	0.24
153	Vazhavachanur	Ponnaiyar	HD, Chennai	Tamil Nadu	Thiruvannamalai	-	4.37	-
154	Vrindawan Bridge (Mathura U/S)	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	0.98	2.26	1.77
155	Wadakbal	Sina	UKD, Pune	Maharashtra	Solapur	*	4.52	3.50
156	Yamuna Expressway Road Bridge, Etamadpur (Agra D/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	-	3.10	3.81

(-) means No Hotspot

(*) means Data not available/ river dry.

Figure 24: Water Quality Monitoring stations having Dissolved Oxygen (DO) below 5.0 mg/L (2024)



7.1.10 Biochemical Oxygen Demand (BOD)

Biochemical oxygen demand is the amount of dissolved oxygen needed (i.e., demanded) by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period (Kaiser, 1998). Biochemical oxygen demand (BOD) holds unique significance in assessing the pollution of river water caused by wastewater discharge from sources such as sewage, industries, and agricultural fields. This parameter is important for river pollution control management and assessing the self-purifying capacity of the river. BOD serves as a comprehensive indicator of river water quality, reflecting the impact of various human activities on the ecosystem and providing essential information for pollution control and environmental management.

Biochemical oxygen demand at 146 water quality stations on 70 rivers across 15 states found above 3 mg/L. The pre-monsoon season witnessed 107 water quality monitoring stations on 48 rivers across 14 states- Uttar Pradesh, Tamil Nadu, Maharashtra, Bihar, Madhya Pradesh, Delhi, Karnataka, Rajasthan, Haryana, Odisha, Gujarat, Uttarakhand, Telangana and Himachal Pradesh reporting average BOD values exceeding 3.0 mg/l. Minimum BOD value 3.01 mg/L was recorded at Elunuthimangalam on River Noyyal in Tamil Nadu and maximum BOD value 70.09 mg/L was recorded at Satrapur station on the Kanhan River in Maharashtra. The lowest BOD values observed at stations like Elunuthimangalam on River Noyyal, Gorakhpur U/S on River Rapti and Shimoga on river Tunga etc. indicate lower levels of organic pollution. Conversely, the highest BOD values recorded at stations like Satrapur, Yamuna Expressway Road Bridge, Delhi Railway Bridge, Galeta, Noida and Okhla Barrage highlight severely polluted rivers with significant organic contamination.

In the monsoon season, 103 water quality monitoring stations on 48 rivers in 13 states of India- Madhya Pradesh, Uttar Pradesh, Maharashtra, Bihar, Rajasthan, Delhi, Karnataka, Haryana, Tamil Nadu, Andhra Pradesh, Gujarat, Uttarakhand and Telangana exceeded the acceptable limit of BOD. Minimum BOD Value 3.01 mg/L recorded at Cholachagudda on River Malaprabha Karnatka and Varanasi on River Ganga Uttar Pradesh and maximum BOD Value was recorded 70.96 mg/L at Singasadanapalli station on the Ponnaiyar River in Tamil Nadu. Stations with low BOD values, such as Baluaghat, Cholachagudda, Dhengbridge, Keolari, Naidupet, Sultanpur and Varanasi indicate lower levels of organic pollution even during the monsoon season. Conversely, stations with high BOD values, like Singasadanapalli, Kalindi Kunj, Noida and Satrapur, signify severe organic contamination, likely due to untreated sewage and agricultural runoff.

Finally, in the post-monsoon season, 87 water quality monitoring stations on 36 rivers in 13 states of India- Uttar Pradesh, Odisha, Maharashtra, Madhya Pradesh, Delhi, Bihar, Tamil Nadu, Haryana Andhra Pradesh, Gujarat, Uttarakhand, Karnataka and Telangana recorded average BOD values exceeding 3.0 mg/l. Minimum BOD Value 3.03 mg/L was recorded at Jajmau station on Ganga River in Uttar Pradesh and maximum BOD Value was recorded 66.43 mg/L at Singasadanapalli station on the Ponnaiyar River in Tamil Nadu.

Comparing the seasonal trends, it's evident that the pre-monsoon season generally witnesses higher BOD levels compared to the monsoon and post-monsoon seasons. This is attributed to dillution of pollutants out from urban and agricultural areas during heavy rainfall.

Comparision between 2023 & 2024:

The comparison of Biochemical Oxygen Demand (BOD) hot-spots between 2022 and 2023 illustrates significant trends in water quality across different seasonal periods. The data is summarized in the following table:

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Biochemical Oxygen Demand		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	152	108	132	102
2024	146	107	103	87

In 2024, the number of water quality monitoring stations decreased for all seasons compared to 2023, indicating improvement in the water quality of the rivers. During the pre-monsoon, monsoon, and post-monsoon seasons in 2023 and 2024, 81 water quality stations across 41 rivers were identified as common hotspot stations.

The hot spot study and GIS map for biochemical oxygen demand (BOD) are given below in Table 16 and figure 25.

Table 16: Monitoring stations having biochemical oxygen Demand (BOD) > 3.0 mg/l in River Water in 2024

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	A.B. Road Crossing	Parwati	CD, Jaipur	Madhya Pradesh	Guna	*	4.95	*
2	Akbarpur	Chhoti sarju	MGD-3, Varanasi	Uttar Pradesh	Ambedkar nagar	3.97	3.49	3.76
3	Allahabad	Ganga	MGD-3, Varanasi	Uttar Pradesh	Allahabad	3.56	3.24	3.24
4	Ankinghat	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur Dehat	5.93	-	3.39
5	AP Puram	Chittar	SRD, Coimbatore	Tamil Nadu	Tirunelveli	6.71	*	-
6	Aradei	Aradei	ERD, Bhubaneswar	Odisha	Keonjhar	-	-	3.05
7	Auraiya	Yamuna	LYD, Agra	Uttar Pradesh	Auraiya	13.35	3.55	7.56
8	B.P.M. (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	41.36	26.43	25.27
9	Baghpat	Yamuna	UYD, Delhi	Uttar Pradesh	Baghpat	17.60	-	-
10	Bairgania	Lalbekia	LGD-1, Patna	Bihar	Sitamarhi	3.51	-	-
11	Baleni	Hindon	UYD, Delhi	Uttar Pradesh	Baghpat	46.22	33.00	34.24
12	Baluaghat	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	3.43	3.09	3.23
13	Bamni (Nagpur)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	3.63	-	3.27
14	Banda	Ken	LYD, Agra	Uttar Pradesh	Banda	-	-	3.11
15	Banka	Chandan	LGD-2, Patna	Bihar	Banka	-	3.14	-
16	Bansi	Rapti	MGD-1, Lucknow	Uttar Pradesh	Siddharth nagar	-	5.38	-
17	Bareilly	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	8.58	12.48	6.73
18	Basti	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	9.58	11.65	5.95
19	Basti D/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	12.66	13.45	6.61
20	Basti U/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	6.57	9.50	4.59
21	Bhadana Village D/s of Kota City	Chambal	CD, Jaipur	Rajasthan	Kota	*	3.89	*
22	Bhind	Kunwari	LYD, Agra	Madhya Pradesh	Bhind	-	-	3.49
23	Bhitaura	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehpur	10.43	6.15	4.48
24	Birdghat	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	-	3.55	-
25	Bithoor	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	4.08	-	-
26	Burhanpur	Tapi	TD, Surat	Madhya Pradesh	Burhanpur	3.95	-	-
27	Chandrika Devi	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	4.14	5.89	3.31
28	Chilla Gaon	Hindon Cut	UYD, Delhi	Delhi	East Delhi	54.21	39.84	36.61
29	Chittorgarh	Gambhiri	CD, Jaipur	Rajasthan	Chittorgarh	*	9.92	*
30	Cholachagudda	MALAPRABHA	CD, Bengaluru	Karnataka	Bagalkot	*	3.01	-
31	Dabri	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Shajahanpur	11.81	10.76	8.38
32	Dadri	Sahibi	UYD, Delhi	Haryana	Dadri	*	16.72	*
33	Daund	Bhima	UKD, Pune	Maharashtra	Pune	*	7.19	*
34	Delhi Railway Bridge	Yamuna	UYD, Delhi	Delhi	North Delhi	68.14	38.81	42.52
35	Dhaneta	Baigul/Kicha	MGD-2, Lucknow	Uttar Pradesh	Moradabad	10.87	7.23	15.07
36	Dhansa	Sahibi	UYD, Delhi	Haryana	Jhjjar	*	24.67	*
37	Dhareri	Chambal	CD, Jaipur	Madhya Pradesh	Ujjain	*	4.41	*

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
38	Dhengbridge	Bagmati	LGD-1, Patna	Bihar	Sitamarhi	-	3.07	3.11
39	Dobhi	Phalgu	LGD-2, Patna	Bihar	Gaya	3.53	-	-
40		Noyyal	SRD, Coimbatore	Tamil Nadu	Erode	3.01	-	-
41	Etawah	Yamuna	LYD, Agra	Uttar Pradesh	Etawah	25.43	18.08	19.26
42	Fatehgarh	Ganga	MGD-2, Lucknow	Uttar Pradesh	Farukkhabad	7.14	3.65	3.41
43	Galeta	Hindon	UYD, Delhi	Uttar Pradesh	Meerut	66.04	28.94	43.75
44	Garhmukteshwar	Ganga	MGD-2, Lucknow	Uttar Pradesh	Hapur	3.66	3.26	-
45	Garrauli	Dhasan	LYD, Agra	Madhya Pradesh	Chhattarpur	-	3.41	-
46	Gaya	Phalgu	LGD-2, Patna	Bihar	Gaya	3.24	-	-
47	Ghazipur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Ghazipur	3.87	3.53	3.32
48	Gokul barrage Mathura D/S	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	40.50	28.72	32.31
49	Gomti Nagar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	16.11	19.88	15.26
50	Gopurajapuram	Cauvery/Puravidaiyanar	HD, Chennai	Tamil Nadu	Nagapattinam	-	3.36	-
51	Gorakhpur D/S	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	3.99	5.47	-
52	Gorakhpur U/S	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	3.02	3.67	-
53	Gudam Bridge	Pranhita	WD, Nagpur	Maharashtra	Gadchiroli	3.73	-	-
54	Gummanur	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	36.78	25.53	30.39
55	Hamirpur	Yamuna	LYD, Agra	Uttar Pradesh	Hamirpur	6.11	-	5.06
56	Hathikhana	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehgarh	9.09	5.04	4.82
57	Irrukkankudi	Vaippar	SRD, Coimbatore	Tamil Nadu	Virudhunagar	4.27	*	3.58
58	Jajmau	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	6.21	4.83	3.03
59	Jaunpur	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	3.96	3.43	3.49
60	Jawahar Bridge, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	18.74	13.97	23.68
61	K M Vadi	Cauvery/ Lakshmanthirth	CD, Bengaluru	Karnataka	Mysore	6.52	-	-
62	K.T.(Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	70.00	50.71	63.33
63	Kachlabridge	Ganga	MGD-2, Lucknow	Uttar Pradesh	Badaun	4.32	-	-
64	Kailash Mandir, (Agra U/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	22.19	23.05	20.16
65	Kalindi Kunj	Agra Canal	UYD, Delhi	Delhi	East Delhi	55.05	46.44	37.89
66	Kalpi	Yamuna	LYD, Agra	Uttar Pradesh	Jalaun	5.78	-	5.91
67	Kannauj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kannauj	5.82	7.31	8.11
68	Kanpur	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	3.55	3.59	-
69	Kasganj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kasganj	10.13	15.73	11.92
70	Katri Umrauli	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kannauj	4.61	3.57	4.16
71	Kazipura	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Moradabad	3.75	5.68	5.90
72	Keolari	Wainganga	WD, Nagpur	Madhya Pradesh	Seoni	-	3.03	-
73	Koggedoddi	Arkavathi	CD, Bengaluru	Karnataka	Ramanagara	-	4.50	-
74	Kota-By Pass Hanging Road Bridge U/S of Kota City	Chambal	CD, Jaipur	Rajasthan	Kota	*	3.14	*
75	Kudlur	Palar	SRD, Coimbatore	Tamil Nadu	Chamarajanagara	*	3.20	-
76	Kurundwad	Krishna	UKD, Pune	Maharashtra	Kolhapur	*	3.83	-
77	Lucknow	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	18.09	17.22	15.76

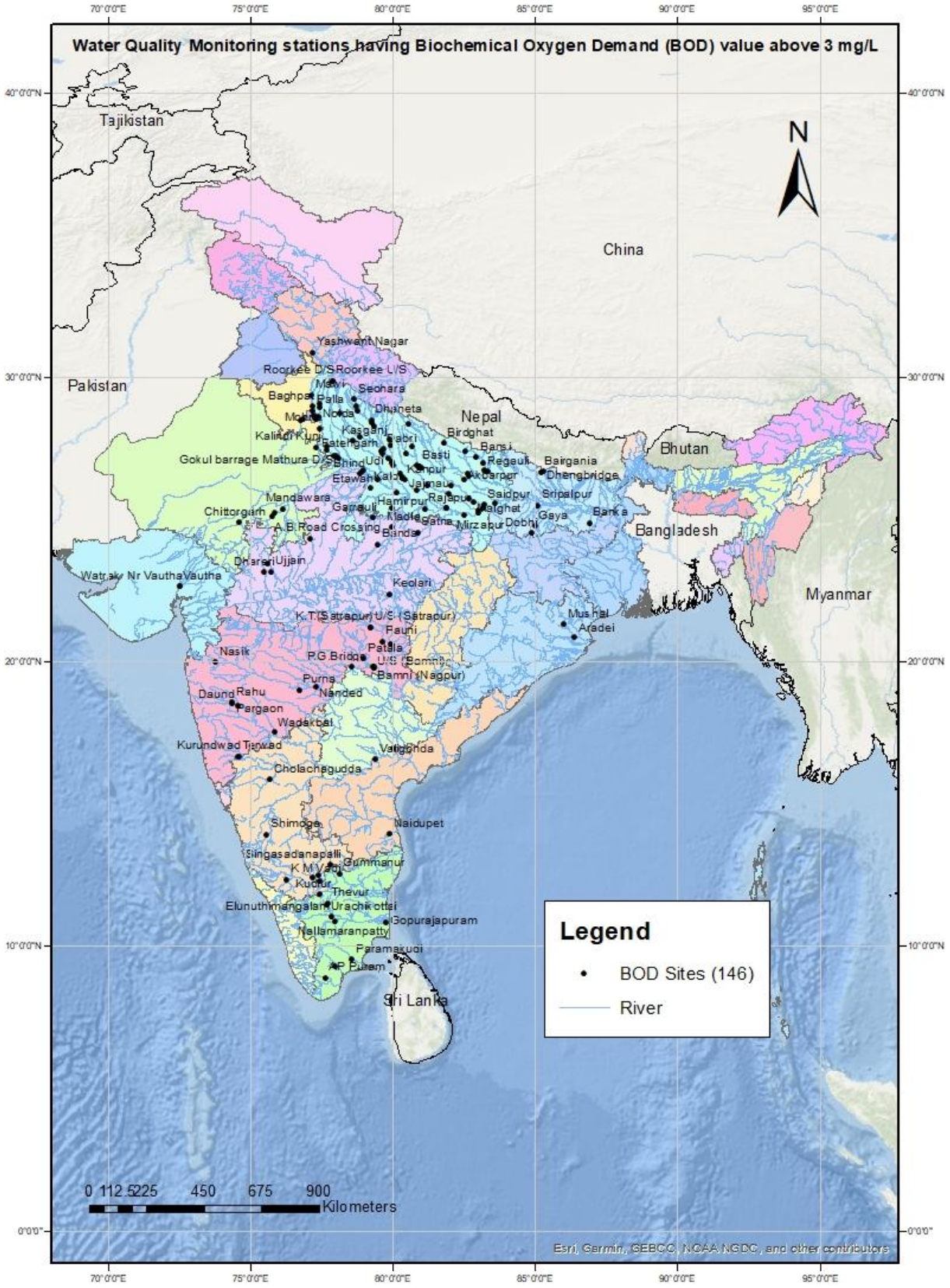
S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
78	Madla	Ken	LYD, Agra	Madhya Pradesh	Panna	*	-	3.38
79	Mahidpur	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	8.44	*
80	Maighat	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	3.21	-	3.24
81	Mandawara	Chambal	CD, Jaipur	Rajasthan	Kota	13.00	-	-
82	Mawi	Yamuna	UYD, Delhi	Uttar Pradesh	Muzaffar Nagar	22.98	-	-
83	Mehandipur	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kannauj	5.40	5.30	5.22
84	Mirzapur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Mirzapur	3.68	3.33	3.49
85	Mohna	Yamuna	UYD, Delhi	Haryana	Faridabad	48.93	24.85	24.27
86	Moradabad	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Moradabad	16.62	13.32	6.97
87	Mushal	Baitarani	ERD, Bhubaneswar	Odisha	Keonjhar	3.11	-	-
88	Naidupet	Swarnamukhi	HD, Chennai	Andhra Pradesh	Nellore	-	3.10	-
89	Nallamaranpatty	Amaravathi	SRD, Coimbatore	Tamil Nadu	Karur	3.29	-	-
90	Nanded	Godavari	UGD, Hyderabad	Maharashtra	Nanded	5.53	4.49	3.83
91	Nasik	Godavari	UGD, Hyderabad	Maharashtra	Nasik	-	-	8.10
92	Neemsar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Sitapur	4.96	5.74	3.04
93	Noida	Hindon	UYD, Delhi	Uttar Pradesh	Gautam Budh Nagar	65.62	52.92	37.75
94	Okhla barrage	Yamuna	UYD, Delhi	Delhi	South Delhi	57.94	33.33	37.64
95	P.G.Bridge	Penganga	WD, Nagpur	Maharashtra	Yavatmal	-	-	3.17
96	Paleru Bridge	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	*	-	3.46
97	Paliakalan	Sharda	MGD-1, Lucknow	Uttar Pradesh	Lakhimpur Kheri	3.22	-	-
98	Palla	Yamuna	UYD, Delhi	Delhi	North West Delhi	18.23	8.59	-
99	Paramakudi	Vaigai	SRD, Coimbatore	Tamil Nadu	Ramanathapuram	6.37	-	-
100	Pargaon	Bhima	UKD, Pune	Maharashtra	Pune	*	7.81	*
101	Parmat ghat	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	4.05	3.34	3.47
102	Parsohan ghat	Burhi Rapti	MGD-1, Lucknow	Uttar Pradesh	Sidharthnagar	3.57	6.38	3.50
103	Patala	Wardha	WD, Nagpur	Maharashtra	Chandrapur	3.28	-	-
104	Pauni	Wainganga	WD, Nagpur	Maharashtra	Bhandara	3.71	-	-
105	Pingalwada	Dhadhar	TD, Surat	Gujarat	Vadodara	13.73	15.08	18.45
106	Poiyaghat, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	20.71	21.61	20.00
107	Pratapgarh	Sai	MGD-3, Varanasi	Uttar Pradesh	Pratapgarh	4.05	3.51	3.80
108	Purna	Purna	UGD, Hyderabad	Maharashtra	Parbhani	-	-	3.48
109	Rahu	Bhima	UKD, Pune	Maharashtra	Pune	*	11.21	*
110	Rai Bareli	Sai	MGD-2, Lucknow	Uttar Pradesh	Rae Bareili	10.67	13.33	5.51
111	Rajapur	Yamuna	LYD, Agra	Uttar Pradesh	Chitrakoot	-	-	3.69
112	Regauli	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	-	3.64	-
113	Roorkee D/S	Saloni	HGD, Haridwar	Uttarakhand	Haridwar	27.50	20.87	18.00
114	Roorkee U/S	Saloni	HGD, Haridwar	Uttarakhand	Haridwar	24.67	17.40	14.67
115	Saidpur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Ghazipur	3.25	-	3.30
116	Sakhara	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	3.39	-	-

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
117	Satna	Tons	MGD-3, Varanasi	Madhya Pradesh	Satna	3.46	3.16	3.44
118	Seohara	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bijnaur	4.29	5.69	5.76
119	Shahjahanpur	Khannaut	MGD-2, Lucknow	Uttar Pradesh	Shahjahanpur	10.33	11.54	6.63
120	Shastri Bridge	Ganga	MGD-3, Varanasi	Uttar Pradesh	Allahabad	3.76	3.41	3.30
121	Shimoga	Tunga	CD, Bengaluru	Karnataka	Shimoga	3.03	-	*
122	Singasadanapalli	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	61.17	70.96	66.43
123	Sitapur	sarayan	MGD-2, Lucknow	Uttar Pradesh	Sitapur	10.83	12.42	5.36
124	Sripalpur	Punpun	LGD-2, Patna	Bihar	Patna	3.21	-	-
125	Sultanpur	Gomti	MGD-3, Varanasi	Uttar Pradesh	Sultanpur	3.36	3.06	3.62
126	T Bekuppe	Arkavathy	CD, Bengaluru	Karnataka	Ramanagara	8.50	7.38	9.38
127	T K Halli	Shimsha	CD, Bengaluru	Karnataka	Mandya	*	3.20	-
128	Tanda D/S	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Ambedkar nagar	3.37	-	-
129	Terwad	Panchganga	UKD, Pune	Maharashtra	Kolhapur	*	5.28	6.80
130	Thevur	Sarabenga	SRD, Coimbatore	Tamil Nadu	Salem	4.74	6.12	-
131	Tiharkhera	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	8.50	15.88	9.11
132	Tondarpur	Sukheta	MGD-2, Lucknow	Uttar Pradesh	Hardoi	10.18	10.62	5.76
133	U/S (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	3.61	3.46	3.60
134	U/S (Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	4.53	-	-
135	Udi	Chambal	LYD, Agra	Uttar Pradesh	Etawah	-	-	5.51
136	Ujjain	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	13.42	-
137	Urachikottai	Cauvery	SRD, Coimbatore	Tamil Nadu	Erode	5.53	-	-
138	V.S. Bridge	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	3.81	3.61	3.26
139	Valigonda	Musi	LKD, Hyderabad	Telangana	Nalgonda	11.18	13.89	49.24
140	Varanasi	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	3.47	3.01	3.35
141	Vautha	Sabarmati	MD, Gandhinagar	Gujarat	Ahmedabad	23.66	18.05	19.83
142	Vrindawan Bridge (Mathura U/S)	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	35.77	30.87	33.52
143	Wadakbal	Sina	UKD, Pune	Maharashtra	Solapur	*	5.24	-
144	Watrak Nr Vautha	Watrak	MD, Gandhinagar	Gujarat	Ahmedabad	*	3.80	*
145	Yamuna Expressway Road Bridge, Etamadpur (Agra D/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	22.01	21.68	24.16
146	Yashwant Nagar	Giri	UYD, Delhi	Himachal Pradesh	Simaur	6.34	-	-

(-) means No Hotspot

(*) means Data not available/ river dry.

Figure 25: Water Quality Monitoring stations having Biochemical Oxygen Demand (BOD) above 3.0 mg/L (2024)



7.1.11 Total Coliform (TC)

The coliform group primarily consists of species from genera such as Citrobacter, Enterobacter, Escherichia, Klebsiella, including fecal coliforms. Although coliform organisms may not be directly linked to the presence of viruses in drinking water, the coliform test remains essential for monitoring the microbial quality of public water supplies. This bacterial group is present in large numbers throughout all seasons, possibly attributed to the addition of sewage and various forms of waste, higher concentrations of suspended particles, and the dark coloration of receiving water.

Total Coliforms at 378 water quality stations on 188 rivers in 20 states found above 500 MPN/100mL. During the pre-monsoon season, 227 water quality monitoring stations across 16 states of India- Maharashtra, Assam, Uttar Pradesh, Karnataka, Tamil Nadu, Bihar, Madhya Pradesh, Uttarakhand, Rajasthan, Andhra Pradesh, Telangana, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Haryana, Puducherry, Kerala and Odishareported average TC values exceeding 500 MPN/100 ml. In the monsoon season, 359 water quality monitoring stations in 19 states of India- Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, Kerala, Bihar, Uttarakhand, Assam, Telangana, Chhattisgarh, Gujarat, Haryana, Delhi, Himachal Pradesh, Jharkhand and Odisha similar findings. Finally, in the post-monsoon season, 317 water quality monitoring stations in 20 states of India- Maharashtra, Rajasthan, Karnataka, Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Kerala, Bihar, Madhya Pradesh, Uttarakhand, Telangana, Assam, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Jharkhand, Haryana, Puducherry and Odisha recorded average TC values exceeding 500 MPN/100 ml.

Comparision between 2023 & 2024:

The comparison of total coliform hot-spots between 2023 and 2024 illustrates significant trends in water quality across different seasonal periods. The data is summarized in the following table:

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Total Coliforms		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	277	199	258	215
2024	378	227	359	317

The hot spot study and GIS map for total coliform (TC) parameter are given below in Table 17 and figure 26.

Table 17: Monitoring stations having Total Coliform (TC) > 500 MPN/100 mL in River Water in 2024

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	A.B. Road Crossing	Parwati	CD, Jaipur	Madhya Pradesh	Guna	*	174700	*
2	A.P.M.(Ashti)	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	10160	5907	8605
3	Abu Road	Banas	MD, Gandhinagar	Rajasthan	Sirohi	*	7988	8200
4	Addoor	Gurupur	SWRD, Kochi	Karnataka	Dakshina Kannada	*	910	940
5	Aie NH Xing	Aie	MBD, Guwahati	Assam	Bongaigaon	3000	-	-
6	Akbarpur	Chhoti sarju	MGD-3, Varanasi	Uttar Pradesh	Ambedkar nagar	5433	3673	4383
7	Akkihebbal	Hemavathi	CD, Bengaluru	Karnataka	Mandya	303500	430600	188667
8	Aklera	Parwan	CD, Jaipur	Rajasthan	Jhalawar	*	33000	*
9	Alandurai	Noyyal	SRD, Coimbatore	Tamil Nadu	Coimbatore	*	18963	*
10	Alladupalli	Pennar/Kunderu	HD, Chennai	Andhra Pradesh	Kadapa	-	1727	1767
11	Allahabad	Ganga	MGD-3, Varanasi	Uttar Pradesh	Allahabad	5687	4733	4800
12	Ambarampalayam	Aliyar	SRD, Coimbatore	Tamil Nadu	Coimbatore	17120	19000	23167
13	Ambasamudram	Vaigai	SRD, Coimbatore	Tamil Nadu	Theni	11700	44500	8683
14	Ankinghat	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur Dehat	2700	2300	2100
15	AP Puram	Chittar	SRD, Coimbatore	Tamil Nadu	Tirunelveli	7950	*	4900
16	Arangaly	Chalakudy	SWRD, Kochi	Kerala	Thrissur	*	*	1250
17	Arcot	Palar	HD, Chennai	Tamil Nadu	Ranipet	2243	7389	5200
18	Arjunwad	Krishna	UKD, Pune	Maharashtra	Kolhapur	*	31000	21833
19	Arnota	Uttangan	LYD, Agra	Uttar Pradesh	Agra	*	4700	*
20	Ashramam	Pazhayar	SWRD, Kochi	Tamil Nadu	Kanyakumari	*	2233	2850
21	Ashti	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	2322	3988	7350
22	Auraiya	Yamuna	LYD, Agra	Uttar Pradesh	Auraiya	143627	180444	10533
23	Avarankuppam	Palar	SRD, Coimbatore	Tamil Nadu	Vellore	*	9450	35000
24	Avershe	Seetha	SWRD, Kochi	Karnataka	Uduppi	*	690	1750
25	Ayilam	Vamanapuram	SWRD, Kochi	Kerala	Thiruvananthapuram	*	790	1350
26	Ayodhya	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Ayodhya	3100	2500	*
27	Azamabad	Ganga	LGD-2, Patna	Bihar	Bhagalpur	582	2784	2840
28	B.P.M. (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	16000	13615	11172
29	Badlapur	Ulhas	UKD, Pune	Maharashtra	Thane	107333	87333	60000
30	Baghpat	Yamuna	UYD, Delhi	Uttar Pradesh	Baghpat	282786	83533	47167
31	Bakhari	Wainganga	WD, Nagpur	Madhya Pradesh	Seoni	784	4209	4122
32	Baleni	Hindon	UYD, Delhi	Uttar Pradesh	Baghpat	1181429	426667	1798333
33	Balrampur	Rapti	MGD-1, Lucknow	Uttar Pradesh	Balrampur	2200	2250	2400
34	Baluaghat	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	6940	6100	5900
35	Bamni (Nagpur)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	1611	5646	10367
36	Banda	Ken	LYD, Agra	Uttar Pradesh	Banda	5000	5800	6767
37	Bangapani	Gauri Ganga	MGD-1, Lucknow	Uttarakhand	Pithoragarh	940	880	1100
38	Banjari	Sone	LGD-2, Patna	Bihar	Rohtas	*	5067	3800
39	Banka	Chandan	LGD-2, Patna	Bihar	Banka	*	2650	1650
40	Bansi	Rapti	MGD-1, Lucknow	Uttar Pradesh	Siddharth nagar	1400	1850	2100

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
41	Bantwal	Netravathi	SWRD, Kochi	Karnataka	Dakshina Kannada	*	1147	1200
42	Baranwada	Banas	CD, Jaipur	Rajasthan	Sawai-madhopur	*	92091	40333
43	Bareilly	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	*	33000	21000
44	Barod	Kalisindh	CD, Jaipur	Rajasthan	Kota	44545	63400	77667
45	Basantpur (Ganga)	Ganga	MGD-2, Lucknow	Uttar Pradesh	Bijnaur	*	4350	4700
46	Basoda	Betwa	LYD, Agra	Madhya Pradesh	Vidisha	5373	4733	3117
47	Basti	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	*	7800	*
48	Basti D/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	*	9200	*
49	Basti U/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	*	6800	*
50	Bawapuram	Tungabhadra	LKD, Hyderabad	Andhra Pradesh	Kurnool	1400	5871	11967
51	Beki Road Bridge	Beki	MBD, Guwahati	Assam	Barpeta	3500	565	-
52	Belne Bridge	Gad	CD, Bengaluru	Maharashtra	Sindudurg	182600	349857	188667
53	Bendrahalli	Suvarnavathi	CD, Bengaluru	Karnataka	Chamaraja Nagar	706667	444000	1033333
54	Bhadana Village D/s of Kota City	Chambal	CD, Jaipur	Rajasthan	Kota	*	75286	*
55	Bhadrachalam	Godavari	LGD, Hyderabad	Telangana	Bhadradri-Kothagudem	1753	4767	8440
56	Bhatpalli	Peddavagu	WD, Nagpur	Telangana	Adilabad	2115	7238	6372
57	Bhind	Kunwari	LYD, Agra	Madhya Pradesh	Bhind	4700	5914	6700
58	Bhitaura	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehpur	7000	*	7800
59	Bigod	Banas	CD, Jaipur	Rajasthan	Bhilwara	*	38600	45600
60	Biligundulu	Cauvery	SRD, Coimbatore	Tamil Nadu	Krishnagiri	7940	11933	12070
61	Birdghat	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	4850	26500	*
62	Bithoor	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	4700	7700	5800
63	Buxar	Ganga	LGD-2, Patna	Bihar	Buxar	507	2756	2450
64	Byaladahalli	HARIDRA	CD, Bengaluru	Karnataka	Davanagere	*	505000	148333
65	Chaklagaon	Manas NH Xing	MBD, Guwahati	Assam	Bongaigaon	3400	-	-
66	Chandrika Devi	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	4900	3650	4700
67	Changsari	Kurijali	MBD, Guwahati	Assam	Kamrup (Rural)	-	1097	1822
68	Chengalpet	Palar	HD, Chennai	Tamil Nadu	Chengalpet	2033	3625	1683
69	Chennur	Pennar	HD, Chennai	Andhra Pradesh	Kadapa	*	2075	2067
70	Chindnar	Indravathi	LGD, Hyderabad	Chhattisgarh	Dantewara	2136	4127	7933
71	Chitrasani	Balaram	MD, Gandhinagar	Gujarat	Banaskantha	*	7750	*
72	Chittorgarh	Gambhiri	CD, Jaipur	Rajasthan	Chittorgarh	*	170000	*
73	Cholachagudda	MALAPRABHA	CD, Bengaluru	Karnataka	Bagalkot	*	11580000	1446667
74	Chopan	Sone	MGD-3, Varanasi	Uttar Pradesh	Sonebhadra	2375	1249	1280
75	Chunchanakatte	Cauvery	CD, Bengaluru	Karnataka	Mysore	920000	309333	232000
76	D/S (Ashti)	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	5407	2801	4278
77	Dabri	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Shajahanpur	*	22000	20000
78	Dadri	Sahibi	UYD, Delhi	Haryana	Dadri	*	107250	*
79	Dameracherla	Musi	LKD, Hyderabad	Telangana	Nalgonda	1400	7550	13733
80	Daund	Bhima	UKD, Pune	Maharashtra	Pune	*	76357	*

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
81	Delhi Railway Bridge	Yamuna	UYD, Delhi	Delhi	North Delhi	15492857	6066667	5666667
82	Deongaon Bridge	Bhima	LKD, Hyderabad	Karnataka	Bijapur	*	6338	12600
83	Deosugur	Musi	LKD, Hyderabad	Karnataka	Raichur	1667	4407	10517
84	Derol Bridge	Sabarmati	MD, Gandhinagar	Gujarat	Sabarkantha	10050	7411	8400
85	Dhalegaon	Godavari	UGD, Hyderabad	Maharashtra	Parbhani	1550	5785	9700
86	Dhaneta	Baigul/Kicha	MGD-2, Lucknow	Uttar Pradesh	Moradabad	*	20000	21000
87	Dhansa	Sahibi	UYD, Delhi	Haryana	Jhjjar	*	464167	*
88	Dhareri	Chambal	CD, Jaipur	Madhya Pradesh	Ujjain	*	1200000	*
89	Dholpur	Chambal	LYD, Agra	Rajasthan	Dholpur	10108	3978	5233
90	Dobhi	Phalgu	LGD-2, Patna	Bihar	Gaya	*	2850	4800
91	Duddhi	Kanhar	MGD-3, Varanasi	Uttar Pradesh	Sonebhadra	2149	1467	1837
92	Dudhnoi	Dudhnai	MBD, Guwahati	Assam	Goalpara	-	1188	760
93	Elgin bridge	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Barabanki	1520	2250	*
94	Elunuthimangalam	Noyyal	SRD, Coimbatore	Tamil Nadu	Erode	13985	34693	23467
95	Erinjipuzha	Payaswini	SWRD, Kochi	Kerala	Kasargode	*	827	1095
96	Etawah	Yamuna	LYD, Agra	Uttar Pradesh	Etawah	666167	142889	445000
97	Faizabad U/S	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Ayodhya	*	2700	*
98	Fatehgarh	Ganga	MGD-2, Lucknow	Uttar Pradesh	Farukkhabad	2250	3850	*
99	G.R. Bridge	Godavari	UGD, Hyderabad	Maharashtra	Parbhani	1258	5808	7900
100	Gaisabad	Bearma	LYD, Agra	Madhya Pradesh	Damoh	*	6600	3967
101	Galeta	Hindon	UYD, Delhi	Uttar Pradesh	Meerut	13842857	1526667	5450000
102	Gandhavayal	Gandhayar	SRD, Coimbatore	Tamil Nadu	Coimbatore	11463	18993	20333
103	Gandhighat	Ganga	LGD-2, Patna	Bihar	Patna	1110	3447	2767
104	Gandlapet	Peddavagu	UGD, Hyderabad	Telangana	Nizamabad	1666	6310	10700
105	Ganguwala	Bata	UYD, Delhi	Himachal Pradesh	Sirmaur	28857	35200	29833
106	Ganod	Bhadar	MD, Gandhinagar	Gujarat	Rajkot	*	10830	4983
107	Garhakota	Sonar	LYD, Agra	Madhya Pradesh	Sagar	*	17000	*
108	Garhmukteshwar	Ganga	MGD-2, Lucknow	Uttar Pradesh	Hapur	1150	1467	1300
109	Garhwa	North Koel	LGD-2, Patna	Jharkhand	Palamu	*	2283	1900
110	Garrauli	Dhasan	LYD, Agra	Madhya Pradesh	Chhattarpur	5271	4560	2530
111	Gaya	Phalgu	LGD-2, Patna	Bihar	Gaya	*	2667	1900
112	Ghat	Sarju	MGD-1, Lucknow	Uttarakhand	Pithoragarh	700	785	920
113	Ghazipur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Ghazipur	7253	4660	6033
114	Gokak	Ghataprabha	CD, Bengaluru	Karnataka	Belgaum	280000	4733333	542333
115	Gokul barrage Mathura D/S	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	7764286	5400000	1850000
116	Gomti Nagar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	170000	125000	140000
117	Gopurajapuram	Cauvery/Puravidaiyanar	HD, Chennai	Tamil Nadu	Nagapattinam	607	-	-
118	Gorakhpur D/S	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	*	36000	*
119	Gorakhpur U/S	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	*	26500	*
120	Gudam Bridge	Pranhita	WD, Nagpur	Maharashtra	Gadchiroli	-	1354	2400
121	Gummanur	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	14613	43286	5400

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
122	Guwahati D.C.Court	Brahmaputra	MBD, Guwahati	Assam	Kamrup (Metro)	-	1908	572
123	Halady	Halady	SWRD, Kochi	Karnataka	Udupi	*	1333	1950
124	Halia	Halia	LKD, Hyderabad	Telangana	Nalgonda	*	10913	9700
125	Hamirpur	Yamuna	LYD, Agra	Uttar Pradesh	Hamirpur	68345	35200	7867
126	Haralahalli	Tungabhadra	CD, Bengaluru	Karnataka	Haveri	580000	364667	159667
127	Hariharapura	Tunga	CD, Bengaluru	Karnataka	Chikamagalur u	314533	594667	390667
128	Haripur	Tons	UYD, Delhi	Uttarakhand	Dehradun	19929	28667	15667
129	Hathidah	Ganga	LGD-2, Patna	Bihar	Patna	895	3299	3617
130	Hathikhana	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehgarh	*	5833	6300
131	Hivra	Wardha	WD, Nagpur	Maharashtra	Wardha	1861	5500	4885
132	Hogenakkal	Chinnar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	*	19500	14000
133	Holehonnur	Bhadra	CD, Bengaluru	Karnataka	Shimoga	310000	522667	159667
134	Honnali	Tungabhadra	CD, Bengaluru	Karnataka	Davanagere	235800	329333	402000
135	Huvinhedgi	Krishna	LKD, Hyderabad	Karnataka	Raichur	2025	5850	10333
136	Irrukkankudi	Vaippar	SRD, Coimbatore	Tamil Nadu	Virudhunagar	26271	*	8950
137	Jagdalpur	Indravathi	LGD, Hyderabad	Chhattisgarh	Bastar	1871	4660	10200
138	Jajmau	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	13000	15000	12000
139	Japla	Sone	LGD-2, Patna	Jharkhand	Palamu	*	2333	1240
140	Jaunpur	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	5833	4587	4433
141	Jawahar Bridge, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	293333	327500	333333
142	Jhalawar	Kalisindh	CD, Jaipur	Rajasthan	Jhalawar	*	36100	*
143	Jhansi-Mirzapur Highway Road Bridge, (Sahijina D/S)	Betwa	LYD, Agra	Uttar Pradesh	Hamirpur	4264	4000	2800
144	K M Vadi	Cauvery/ Lakshmanthirth	CD, Bengaluru	Karnataka	Mysore	704000	7669333	1196667
145	K.T.(Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	16000	13338	13917
146	Kabirganj	Sharda	MGD-1, Lucknow	Uttar Pradesh	Pilibhit	*	1350	*
147	Kachlabridge	Ganga	MGD-2, Lucknow	Uttar Pradesh	Badaun	1250	1550	1700
148	Kailash Mandir, (Agra U/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	338333	246667	408333
149	Kalampur	Kaliyar	SWRD, Kochi	Kerala	Ernakulam	*	960	1550
150	Kalanaur	Yamuna	UYD, Delhi	Uttar Pradesh	Saharanpur	47786	29067	32167
151	Kallooppara	Manimala	SWRD, Kochi	Kerala	Pathanamthit ta	*	635	1020
152	Kalpi	Yamuna	LYD, Agra	Uttar Pradesh	Jalaun	73800	63300	6600
153	Kamalpur	Banas	MD, Gandhinagar	Gujarat	Banaskantha	*	6475	*
154	Kannauj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kannauj	*	11000	9300
155	Kanpur	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	9400	9400	9300
156	Karad	Krishna	UKD, Pune	Maharashtra	Satara	*	44800	9000
157	Karathode	Kadalundi	SWRD, Kochi	Kerala	Malappuram	*	820	1450
158	Karnal	Yamuna	UYD, Delhi	Haryana	Karnal	158857	26600	28167
159	Kasganj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kasganj	*	17000	14000
160	Katri Umrauli	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kannauj	*	9300	6800
161	Kazipura	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Moradabad	*	20000	*
162	Keesara	Munneru	LKD, Hyderabad	Andhra Pradesh	Krishna	*	8580	5400

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
163	Kellodu	VEDAVATHI	CD, Bengaluru	Karnataka	Chitradurga	1600000	708778	623333
164	Keolari	Wainganga	WD, Nagpur	Madhya Pradesh	Seoni	1219	5366	6767
165	Khanpur	Mahi	MD, Gandhinagar	Gujarat	Anand	8713	8560	7867
166	Khatoli	Parwati	CD, Jaipur	Rajasthan	Kota	44909	67091	65500
167	Khudrakhowa	Manas NH Xing	MBD, Guwahati	Assam	Barpeta	16000	560	-
168	Kidangoor	Meenachil	SWRD, Kochi	Kerala	Kottayam	*	1733	1500
169	Kodumudi	Cauvery	SRD, Coimbatore	Tamil Nadu	Erode	10107	14373	7917
170	Koelwar	Sone	LGD-2, Patna	Bihar	Bhojpur	*	3100	2300
171	Koggedoddi	Arkavathi	CD, Bengaluru	Karnataka	Ramanagara	1411933	6294667	177333
172	Kokiwada	Pench	WD, Nagpur	Madhya Pradesh	Chhindwara	2854	3800	908
173	Kollegala	Cauvery	CD, Bengaluru	Karnataka	Chamaraja Nagar	220375	448500	252000
174	Konta	Sabari	LGD, Hyderabad	Chhattisgarh	Sukma	1853	5514	8060
175	Kopergaon	Godavari	UGD, Hyderabad	Maharashtra	Ahmednagar	*	8822	*
176	Kora	Rind	LYD, Agra	Uttar Pradesh	Fatehpur	4432	4057	3500
177	Kota-By Pass Hanging Road Bridge U/S of Kota City	Chambal	CD, Jaipur	Rajasthan	Kota	*	75333	*
178	Kudige	Cauvery	CD, Bengaluru	Karnataka	Kodagu	451333	4720000	1070000
179	Kudlur	Palar	SRD, Coimbatore	Tamil Nadu	Chamarajana gara	*	16500	2700
180	Kuldahbridge	Sone	MGD-3, Varanasi	Madhya Pradesh	Sidhi	3440	1893	2133
181	Kulsi	Kulsi	MBD, Guwahati	Assam	Kamrup	1300	1798	-
182	Kumarapalayam	Varahanadhi	HD, Chennai	Puducherry	Puducherry	785	*	890
183	Kumbidi	Bharatapuzha	SWRD, Kochi	Kerala	Palakkad	*	620	1020
184	Kumhari	Wainganga	WD, Nagpur	Madhya Pradesh	Balaghat	-	3938	3137
185	Kuniyil	Chaliyar	SWRD, Kochi	Kerala	Malappuram	*	810	1550
186	Kuppellur	KUMUDVATHI	CD, Bengaluru	Karnataka	Haveri	*	409000	465333
187	Kurundwad	Krishna	UKD, Pune	Maharashtra	Kolhapur	*	21143	17000
188	Kuttiyadi	Kuttiyadi	SWRD, Kochi	Kerala	Kozhikode	*	1500	1950
189	Kuzhithurai	Thamarabarani	SWRD, Kochi	Tamil Nadu	Kanyakumari	*	2000	2450
190	Lakhisarai	Kiul	LGD-2, Patna	Bihar	Lakhisarai	*	3933	-
191	Lakkavalli	Bhadra	CD, Bengaluru	Karnataka	Chikmagalur	182867	272667	555333
192	Lakshmanapatti	Kodaganar	SRD, Coimbatore	Tamil Nadu	Dindigul	8950	22225	8783
193	Lalganj	Gandak	LGD-2, Patna	Bihar	Vaishali	*	2900	1700
194	Lalpur	Sengar	LYD, Agra	Uttar Pradesh	Kanpur Dehat	7082	12680	3717
195	Lodhikheda	Jam	WD, Nagpur	Madhya Pradesh	Chhindwara	7013	5946	5988
196	Lucknow	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	77667	55500	70000
197	Luwara	Shetrunji	MD, Gandhinagar	Gujarat	Bhavnagar	11811	7064	6550
198	M H Halli	Hemavathy	CD, Bengaluru	Karnataka	Hassan	236286	430333	114667
199	Madamon	Pampa	SWRD, Kochi	Kerala	Pathanamthit ta	*	1280	1550
200	Madhira	Wyra	LKD, Hyderabad	Telangana	Khammam	2200	7660	11467
201	Madla	Ken	LYD, Agra	Madhya Pradesh	Panna	*	3680	4300
202	Magaral	Palar/Cheyyar	HD, Chennai	Tamil Nadu	Kancheepura m	1550	-	1400

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
203	Magardhara	Wainganga	WD, Nagpur	Maharashtra	Balaghat	-	3614	4100
204	Mahalgaon	Wainganga	WD, Nagpur	Maharashtra	Gondia	1980	3281	1165
205	Mahidpur	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	164500	*
206	Maighat	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	4713	4093	4767
207	Malakkara	Pampa	SWRD, Kochi	Kerala	Pathanamthitta	*	993	1450
208	Malkhed	Bhima	LKD, Hyderabad	Karnataka	Gulbarga	1857	6392	10517
209	Manakkad	Thodupuzha	SWRD, Kochi	Kerala	Idukki	*	787	1300
210	Manas NH Xing	Manas NH Xing	MBD, Guwahati	Assam	Bongaigaon	9000	1740	883
211	Mancherial	Godavari	UGD, Hyderabad	Telangana	Adilabad	1834	5536	9200
212	Mandawara	Chambal	CD, Jaipur	Rajasthan	Kota	63071	50400	80333
213	Manderial	Chambal	CD, Jaipur	Rajasthan	Karauli	55929	49400	60500
214	Mangaon	Kal	UKD, Pune	Maharashtra	Raigad	*	21646	8000
215	Manjhi	Ghaghra	LGD-2, Patna	Bihar	Saran	*	4750	1700
216	Mankara	Bharatapuzha	SWRD, Kochi	Kerala	Palakkad	*	1900	2300
217	Mantralayam	Tungabhadra	LKD, Hyderabad	Andhra Pradesh	Kurnool	*	7492	8117
218	Marella	Gundakamma	LKD, Hyderabad	Andhra Pradesh	Prakasam	*	9500	5400
219	Marol	Varada	CD, Bengaluru	Karnataka	Haveri	*	1108333	793333
220	Mataji	Mahi	MD, Gandhinagar	Madhya Pradesh	Ratlam	7950	8033	6350
221	Mawi	Yamuna	UYD, Delhi	Uttar Pradesh	Muzaffar Nagar	910000	231200	35000
222	Mehandipur	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kannauj	*	10150	*
223	Mejaroad	Tons	MGD-3, Varanasi	Uttar Pradesh	Allahabad	2700	2340	2317
224	Menangudi	Cauvery/Noolar	HD, Chennai	Tamil Nadu	Thiruvarur	940	-	-
225	Mirzapur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Mirzapur	5067	4140	3967
226	Mohana	Betwa	LYD, Agra	Uttar Pradesh	Jalaun	4173	4378	33567
227	Mohna	Yamuna	UYD, Delhi	Haryana	Faridabad	16942143	4098667	1733333
228	Moradabad	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Moradabad	*	17000	14000
229	Mungoli	Penganga	WD, Nagpur	Maharashtra	Yavatmal	2283	3196	7362
230	Munugodu	Edduvagu	LKD, Hyderabad	Andhra Pradesh	Guntur	1320	5744	6983
231	Muradpur	Vashishti	UKD, Pune	Maharashtra	Ratnagiri	*	78462	*
232	Murappanadu	Tambraparani	SRD, Coimbatore	Tamil Nadu	Tuticorin	6853	7600	6467
233	Musiri	Cauvery	SRD, Coimbatore	Tamil Nadu	Thiruchirapalli	7873	6080	9517
234	Muthankera	Kabini	CD, Bengaluru	Kerala	Wayanad	477800	6033333	159667
235	Nagothane	Amba	UKD, Pune	Maharashtra	Raigad	*	39877	*
236	Naidupet	Swarnamukhi	HD, Chennai	Andhra Pradesh	Nellore	1400	-	860
237	Nallamaranpatty	Amaravathi	SRD, Coimbatore	Tamil Nadu	Karur	8433	11125	9533
238	Nallathur	Cauvery/Nandalar	HD, Chennai	Puducherry	Karaikal	1010	-	770
239	Nanded	Godavari	UGD, Hyderabad	Maharashtra	Nanded	1771	4540	14233
240	Nandgaon	Wunna	WD, Nagpur	Maharashtra	Wardha	5067	6795	4283
241	Nandipalli	Pennar/Sagileru	HD, Chennai	Andhra Pradesh	Kadapa	1180	1400	1500
242	Nasik	Godavari	UGD, Hyderabad	Maharashtra	Nasik	2613	6400	14867
243	Naugaon	Yamuna	UYD, Delhi	Uttarakhand	Uttarakashi	23571	28533	22500

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
244	Neeleswaram	Periyar	SWRD, Kochi	Kerala	Ernakulam	*	1147	1300
245	Neemsar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Sitapur	2400	2133	*
246	Nellipally	Kallada	SWRD, Kochi	Kerala	Kollam	*	860	1300
247	Nellore	Pennar	HD, Chennai	Andhra Pradesh	Nellore	*	865	1723
248	Noida	Hindon	UYD, Delhi	Uttar Pradesh	Gautam Budh Nagar	26000000	4620000	3166667
249	Nona	Nona	MBD, Guwahati	Assam	Nalbari	800	-	1592
250	Nowrangpur	Indravathi	LGD, Hyderabad	Odisha	Nowrangpur	2343	4380	8750
251	Odenthurai	Kallar	SRD, Coimbatore	Tamil Nadu	Coimbatore	17063	16573	12150
252	Orai-Rath Marg, Chikasi (Sahijina U/S)	Betwa	LYD, Agra	Uttar Pradesh	Jalaun	5473	4044	10683
253	P.G.Bridge	Penganga	WD, Nagpur	Maharashtra	Yavatmal	968	5323	8182
254	Pachawali	Sindh	LYD, Agra	Madhya Pradesh	Shivpuri	*	3280	*
255	Pachegaon	Pravara	UGD, Hyderabad	Maharashtra	Ahmednagar	*	5750	*
256	Padardibadi	Mahi	MD, Gandhinagar	Rajasthan	Dungarpur	11493	8800	6300
257	Pagladiya	Pagladiya	MBD, Guwahati	Assam	Nalbari	*	3070	-
258	Palakkadavu	Karuvannur	SWRD, Kochi	Kerala	Thrissur	*	1230	1070
259	Paleru Bridge	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	*	8570	13733
260	Pali	Chambal	CD, Jaipur	Rajasthan	Sawai-madhopur	48143	41867	40833
261	Paliakalan	Sharda	MGD-1, Lucknow	Uttar Pradesh	Lakhimpur Kheri	*	2250	*
262	Palla	Yamuna	UYD, Delhi	Delhi	North West Delhi	885000	924000	523333
263	Pancharatna	Brahmaputra	MBD, Guwahati	Assam	Goalpara	2400	517	-
264	Paramakudi	Vaigai	SRD, Coimbatore	Tamil Nadu	Ramanathapuram	2800	4900	9383
265	Pargaon	Bhima	UKD, Pune	Maharashtra	Pune	*	26286	*
266	Parmat ghat	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	7000	8150	7800
267	Parsohan ghat	Burhi Rapti	MGD-1, Lucknow	Uttar Pradesh	Sidharthnagar	2200	2600	2600
268	Patala	Wardha	WD, Nagpur	Maharashtra	Chandrapur	5658	6950	3438
269	Patansaongi	Chandrabhaga	WD, Nagpur	Maharashtra	Nagpur	3540	6442	5520
270	Pathagudem	Indravathi	LGD, Hyderabad	Chhattisgarh	Dantewara	1460	4773	7617
271	Pattazhy	Kallada	SWRD, Kochi	Kerala	Kollam	*	947	1170
272	Pauni	Wainganga	WD, Nagpur	Maharashtra	Bhandara	2887	7238	8388
273	Peralam	Cauvery/Vanjiyar	HD, Chennai	Tamil Nadu	Thiruvarur	-	-	760
274	Perumannu	Valapatnam	SWRD, Kochi	Kerala	Kannur	*	943	1020
275	Perur	Godavari	UGD, Hyderabad	Telangana	Mulugu	1708	3759	8117
276	Phulgaon	Bhima	UKD, Pune	Maharashtra	Pune	*	12167	*
277	Poanta	Yamuna	UYD, Delhi	Himachal Pradesh	Simaur	27357	40267	46667
278	Poiyaghat, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	330833	353333	445000
279	Polavaram	Godavari	LGD, Hyderabad	Andhra Pradesh	West Godavari	1733	5264	5283
280	Pratap pur	Yamuna	LYD, Agra	Uttar Pradesh	Prayagraj	7733	7233	6567
281	Pratapgarh	Sai	MGD-3, Varanasi	Uttar Pradesh	Pratapgarh	4047	3100	3367
282	Pratappur	Pravara	UGD, Hyderabad	Maharashtra	Ahmednagar	2800	7067	9200
283	Pudur	Kannadipuzha	SWRD, Kochi	Kerala	Palakkad	*	1233	1450

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
284	Pulamanthole	Pulanthodu	SWRD, Kochi	Kerala	Palakkad	*	865	1550
285	Pulikukku	Kumaradhara	SWRD, Kochi	Karnataka	Dakshina Kannada	*	1280	1800
286	Purna	Purna	UGD, Hyderabad	Maharashtra	Parbhani	3500	5908	11467
287	Puthimari	Puthimari	MBD, Guwahati	Assam	Kamrup	-	2557	-
288	Rahu	Bhima	UKD, Pune	Maharashtra	Pune	*	26429	*
289	Rai Bareli	Sai	MGD-2, Lucknow	Uttar Pradesh	Rae Bareili	2100	3350	3400
290	Rajahmundry	Godavari	LGD, Hyderabad	Andhra Pradesh	East Godavari	1533	5850	9200
291	Rajapur	Yamuna	LYD, Agra	Uttar Pradesh	Chitrakoot	8583	10856	7667
292	Rajegaon	Bagh	WD, Nagpur	Madhya Pradesh	Balaghat	1246	6000	2070
293	Rajghat (Agra)	Betwa	LYD, Agra	Uttar Pradesh	Lalitpur	4545	4660	3133
294	Ramakona	Kanhan	WD, Nagpur	Madhya Pradesh	Chhindwara	637	7258	3383
295	Ramamangalam	Muvattupuzha	SWRD, Kochi	Kerala	Ernakulam	*	740	1150
296	Rangeli	Som	MD, Gandhinagar	Rajasthan	Dungarpur	9613	7500	6800
297	Regauli	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	5400	4850	4600
298	Renukaji	Giri	UYD, Delhi	Himachal Pradesh	Sirmaur	18500	27867	25667
299	Sahijana	Betwa	LYD, Agra	Uttar Pradesh	Hamirpur	4564	3389	8233
300	Saidpur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Ghazipur	6193	4507	4500
301	Saigaon	Manjera	UGD, Hyderabad	Karnataka	Bidar	*	7409	9200
302	Sakhara	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	5597	5833	4850
303	Sakleshpura	Hemavathi	CD, Bengaluru	Karnataka	Hassan	300909	401333	623333
304	Sakmur	Wardha	WD, Nagpur	Maharashtra	Chandrapur	517	4098	1768
305	Salebardi	Chulband	WD, Nagpur	Maharashtra	Bhandara	4088	3280	2848
306	Saloora	Godavari	UGD, Hyderabad	Telangana	Nizamabad	1450	6500	7933
307	Samdoli	Warana	UKD, Pune	Maharashtra	Sangli	*	14500	14500
308	Sangam (LGD)	Kinnersani	LGD, Hyderabad	Telangana	Bhadradri-Kothagudem	1853	4247	7520
309	Sangod	Parwan	CD, Jaipur	Rajasthan	Kota	*	36889	*
310	Santhegulli	Aghnanashni	SWRD, Kochi	Karnataka	Uthara Kannada	*	907	1700
311	Saradaput	Sabari	LGD, Hyderabad	Odisha	Malkangiri	1627	5680	5283
312	Sarangpur	Kalisindh	CD, Jaipur	Madhya Pradesh	Rajgarh	*	122000	*
313	Sarati	Nira	UKD, Pune	Maharashtra	Solapur	*	7122	*
314	Satna	Tons	MGD-3, Varanasi	Madhya Pradesh	Satna	3400	1901	1817
315	Satrapur	Kanhan	WD, Nagpur	Maharashtra	Nagpur	3920	10985	9100
316	Savandapur	Bhavani	SRD, Coimbatore	Tamil Nadu	Erode	5407	9547	9633
317	Seohara	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bijnaur	*	21500	17000
318	Seondha	Sindh	LYD, Agra	Madhya Pradesh	Datia	4149	4080	3067
319	Sevanur	Chittar	SRD, Coimbatore	Tamil Nadu	Erode	*	12980	23000
320	Shahjahanpur	Khannaut	MGD-2, Lucknow	Uttar Pradesh	Shahjahanpur	*	24000	21000
321	Shahzadpur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Kaushambi	4100	3660	3267
322	Shastri Bridge	Ganga	MGD-3, Varanasi	Uttar Pradesh	Allahabad	4800	3980	3750
323	Shimoga	Tunga	CD, Bengaluru	Karnataka	Shimoga	706667	918462	232000
324	Singasadanapalli	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	5600000	8666667	2383333

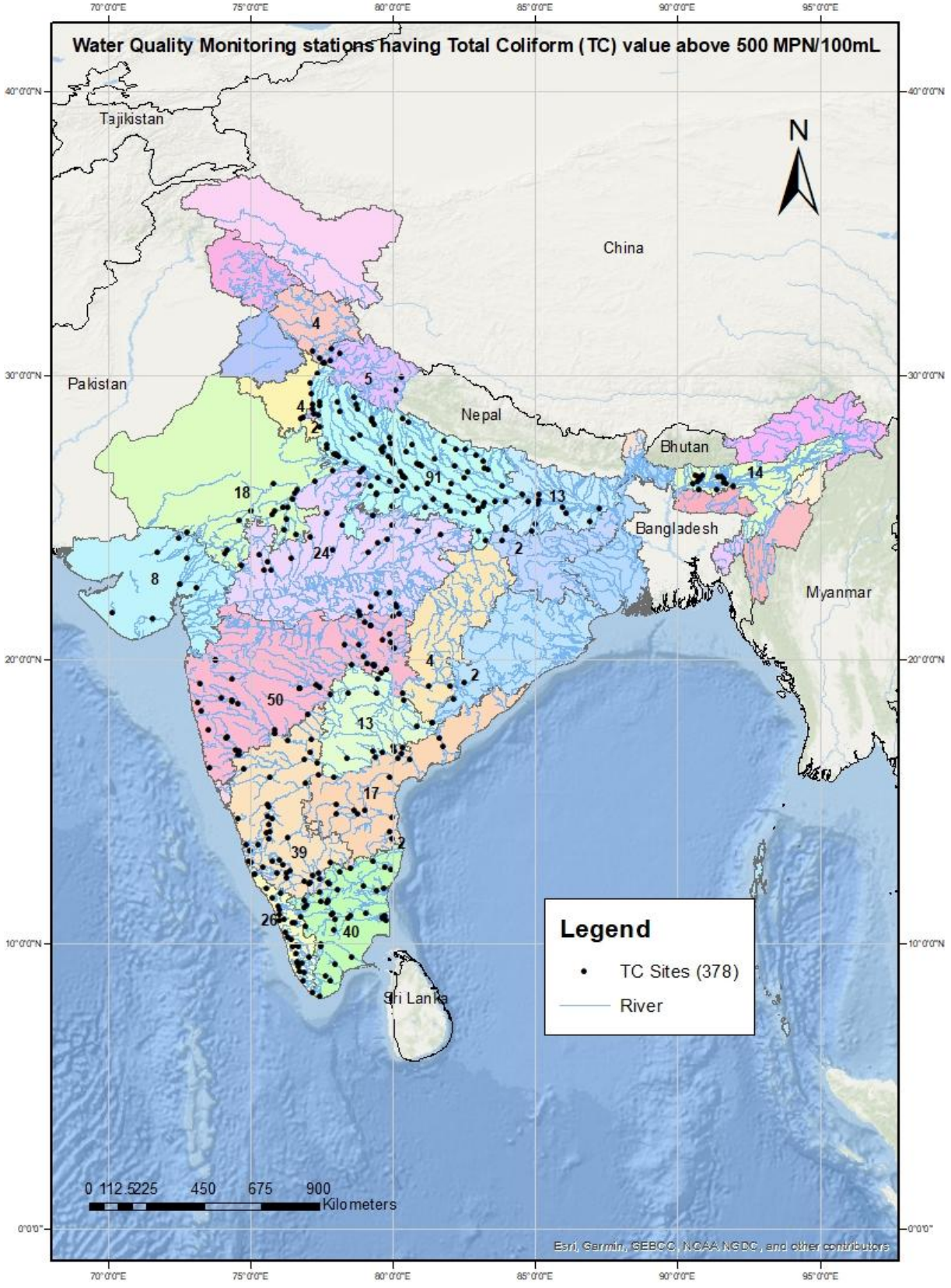
S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
325	Singavaram	Pennar/Chitravathi	HD, Chennai	Andhra Pradesh	Anantapur	*	1400	*
326	Sitapur	sarayan	MGD-2, Lucknow	Uttar Pradesh	Sitapur	1700	1300	*
327	Sonapur	Digaru	MBD, Guwahati	Assam	Kamrup	*	2607	-
328	Sripalpur	Punpun	LGD-2, Patna	Bihar	Patna	*	3300	1850
329	Suddakallu	Dindi	LKD, Hyderabad	Telangana	Mahaboob Nagar	1319	11271	8750
330	Sultanpur	Gomti	MGD-3, Varanasi	Uttar Pradesh	Sultanpur	6567	4840	4333
331	Sulurpet	Kalingi	HD, Chennai	Andhra Pradesh	Nellore	-	1015	1860
332	T Bekuppe	Arkavathy	CD, Bengaluru	Karnataka	Ramanagara	1310000	3578000	793333
333	T K Halli	Shimsha	CD, Bengaluru	Karnataka	Mandya	*	933333	623333
334	T Narsipura	Kabini	CD, Bengaluru	Karnataka	Mysore	273733	495333	188667
335	T. Ramapuram	Hagari	LKD, Hyderabad	Karnataka	Bellary	1700	5173	7183
336	Tadipatri	Pennar	HD, Chennai	Andhra Pradesh	Anantapur	*	3400	*
337	Takali	Bhima	UKD, Pune	Maharashtra	Solapur	*	10000	*
338	Tal	Chambal	CD, Jaipur	Madhya Pradesh	Ratlam	*	97250	*
339	Terwad	Panchganga	UKD, Pune	Maharashtra	Kolhapur	*	34643	17500
340	Thandalaiputhur	Ayyar	SRD, Coimbatore	Tamil Nadu	Thiruchirapalli	*	*	9933
341	Thengudi	Cauvery/Thirumalairajanar	HD, Chennai	Tamil Nadu	Thiruvarur	560	1433	1573
342	Thengumarahada	Bhavani/Moyar	SRD, Coimbatore	Tamil Nadu	Nilgiris	5280	18853	6333
343	Theni	Suruliyar	SRD, Coimbatore	Tamil Nadu	Theni	7800	6260	10667
344	Thevur	Sarabenga	SRD, Coimbatore	Tamil Nadu	Salem	24500	31571	23750
345	Thimmanahalli	Yagachi	CD, Bengaluru	Karnataka	Hassan	555444	588000	200000
346	Thoppur	Thoppaiyar	SRD, Coimbatore	Tamil Nadu	Salem	*	*	21967
347	Thottathinkadavu	Iruvazhinjipuzha	SWRD, Kochi	Kerala	Kozhikode	*	1147	1450
348	Thumpamon	Achankovil	SWRD, Kochi	Kerala	Pathanamthitta	*	960	1020
349	Tiharkhera	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	*	23000	24000
350	Tondarpur	Sukheta	MGD-2, Lucknow	Uttar Pradesh	Hardoi	*	17000	14000
351	Tonk	Banas	CD, Jaipur	Rajasthan	Tonk	*	102818	*
352	Tuini	Tons	UYD, Delhi	Uttarakhand	Dehradun	23429	27733	23000
353	Turtipar	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Ballia	16500	11000	13000
354	U/S (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	7287	9931	7328
355	U/S (Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	12420	9846	13667
356	Udi	Chambal	LYD, Agra	Uttar Pradesh	Etawah	13917	4667	5750
357	Ujjain	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	376083	490000
358	Urachikottai	Cauvery	SRD, Coimbatore	Tamil Nadu	Erode	7450	6064	6417
359	V.S. Bridge	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	5473	4567	3817
360	Valigonda	Musi	LKD, Hyderabad	Telangana	Nalgonda	2200	6954	16000
361	Vandiperiyar	Periyar	SWRD, Kochi	Kerala	Idukki	*	913	1070
362	Varanasi	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	5660	4840	4850
363	Varanavasi	Marudaiyar	SRD, Coimbatore	Tamil Nadu	Perambalur	4900	*	11075
364	Vautha	Sabarmati	MD, Gandhinagar	Gujarat	Ahmedabad	286000	192667	215000
365	Vazhavachanur	Ponnaiyar	HD, Chennai	Tamil Nadu	Thiruvannamalai	-	-	2380

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
366	Vijayawada	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	1956	6121	6983
367	Villupuram	Ponnaiyar	HD, Chennai	Tamil Nadu	Villupuram	1700	*	1733
368	Vrindawan Bridge (Mathura U/S)	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	1593571	698000	273333
369	Wadakbal	Sina	UKD, Pune	Maharashtra	Solapur	*	93909	50000
370	Wadenapalli	Krishna	LKD, Hyderabad	Telangana	Nalgonda	1411	4850	13733
371	Wairagarh	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	-	2827	4672
372	Warunji	Koyna	UKD, Pune	Maharashtra	Satara	*	17444	5000
373	Watrak Nr Vautha	Watrak	MD, Gandhinagar	Gujarat	Ahmedabad	*	7625	*
374	Yadgir	Bhima	LKD, Hyderabad	Karnataka	Gulbarga	*	5869	9200
375	Yamuna Expressway Road Bridge, Etamadpur (Agra D/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	330000	941111	200833
376	Yashwant Nagar	Giri	UYD, Delhi	Himachal Pradesh	Simaur	38143	37000	34000
377	Yelli	Godavari	UGD, Hyderabad	Maharashtra	Nanded	2207	5107	9200
378	Yennehole	Swarna	SWRD, Kochi	Karnataka	Dakshina Kannada	*	740	1250

(-) means No Hotspot.

(*) means river dry/data not available.

Figure 26: Water Quality Monitoring stations having Total Coliform (TC) above 500 MPN/100ml (2024)



7.1.12 Faecal Coliform (FC)

Various indicators of faecal contamination are commonly employed to identify faecal coliform in river water. The abundance of these indicators is assumed to correlate with the density of pathogenic microorganisms originating from faecal sources. Consequently, it serves as an indication of the sanitary risk associated with various water utilizations.

Faecal Coliforms at 322 water quality stations on 143 rivers in 19 states found above 500 MPN/100mL. During pre-monsoon season, 201 water quality monitoring stations across 18 states- Maharashtra, Assam, Uttar Pradesh, Karnataka, Tamil Nadu, Rajasthan, Madhya Pradesh, Andhra Pradesh, Telangana, Chhattisgarh, Delhi, Gujarat, Bihar, Himachal Pradesh, Uttarakhand, Haryana, Kerala and Odisha reported average FC values exceeding 500 MPN/100 ml. In the monsoon season, 310 water quality monitoring stations across 19 states- Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Karnataka, Tamil Nadu, Bihar, Andhra Pradesh, Telangana, Assam, Chhattisgarh, Gujarat, Haryana, Delhi, Himachal Pradesh, Jharkhand, Uttarakhand, Kerala and Odisha displayed similar findings. Finally, in the post-monsoon season, 261 water quality monitoring stations in 19 states- Maharashtra, Rajasthan, Uttar Pradesh, Karnataka, Tamil Nadu, Bihar, Madhya Pradesh, Uttarakhand, Andhra Pradesh, Telangana, Assam, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Jharkhand, Haryana, Kerala and Odisha recorded average FC values exceeding 500 MPN/100 ml.

Comparision between 2023 & 2024:

The comparison of faecal coliform hot-spots between 2023 and 2024 highlights significant trends in water quality across different seasonal periods. The data is summarized in the following table:

YEAR	Total No. of Hotspots found	Number of Hot-Spots found for Faecal Coliforms		
		Pre-Monsoon	Monsoon	Post-Monsoon
2023	257	184	238	181
2024	322	201	310	261

The comparison between 2023 and 2024 suggests some variations in the trends of faecal coliforms across different seasons. While the pre-monsoon and monsoon seasons of 2024 showed increase in the number of monitoring stations with elevated FC levels, post-monsoon season displayed decrease as similarly as in seasons in 2023.

The hot spot study and GIS map for faecal coliform (FC) are given below in Table 18 and figure 27.

Table 18: Monitoring stations having Faecal Coliforms (FC) > 500 MPN in River Water in 2024

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
1	A.B. Road Crossing	Parwati	CD, Jaipur	Madhya Pradesh	Guna	*	35900	*
2	A.P.M.(Ashti)	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	3832	1869	1937
3	Abu Road	Banas	MD, Gandhinagar	Rajasthan	Sirohi	*	3363	3950
4	Aie NH Xing	Aie	MBD, Guwahati	Assam	Bongaigaon	3000	-	-
5	Akbarpur	Chhoti sarju	MGD-3, Varanasi	Uttar Pradesh	Ambedkar nagar	2672	1713	2067
6	Akkihebbal	Hemavathi	CD, Bengaluru	Karnataka	Mandya	15093	13953	3450
7	Aklera	Parwan	CD, Jaipur	Rajasthan	Jhalawar	*	7120	*
8	Alandurai	Noyyal	SRD, Coimbatore	Tamil Nadu	Coimbatore	*	946	*
9	Allahabad	Ganga	MGD-3, Varanasi	Uttar Pradesh	Allahabad	2833	2187	2317
10	Ambarampalayam	Aliyar	SRD, Coimbatore	Tamil Nadu	Coimbatore	2839	1111	1463
11	Ambasamudram	Vaigai	SRD, Coimbatore	Tamil Nadu	Theni	877	1900	728
12	Ankinghat	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur Dehat	1700	1700	1300
13	AP Puram	Chittar	SRD, Coimbatore	Tamil Nadu	Tirunelveli	615	*	680
14	Arjunwad	Krishna	UKD, Pune	Maharashtra	Kolhapur	*	7857	6050
15	Arnota	Uttangan	LYD, Agra	Uttar Pradesh	Agra	*	3400	*
16	Ashti	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	1158	1156	1237
17	Auraiya	Yamuna	LYD, Agra	Uttar Pradesh	Auraiya	91809	108778	6235
18	Avarankuppam	Palar	SRD, Coimbatore	Tamil Nadu	Vellore	*	940	3050
19	Ayodhya	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Ayodhya	1300	1400	*
20	Azamabad	Ganga	LGD-2, Patna	Bihar	Bhagalpur	-	1718	1500
21	B.P.M. (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	8000	6343	3428
22	Badlapur	Ulhas	UKD, Pune	Maharashtra	Thane	20467	30533	16500
23	Baghpat	Yamuna	UYD, Delhi	Uttar Pradesh	Baghpat	29286	20667	8567
24	Bakhari	Wainganga	WD, Nagpur	Madhya Pradesh	Seoni	-	1184	1072
25	Baleni	Hindon	UYD, Delhi	Uttar Pradesh	Baghpat	364286	78267	489667
26	Balrampur	Rapti	MGD-1, Lucknow	Uttar Pradesh	Balrampur	940	1250	1400
27	Baluaghat	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	3400	2787	2833
28	Bamni (Nagpur)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	675	2136	3277
29	Banda	Ken	LYD, Agra	Uttar Pradesh	Banda	3208	2600	1870
30	Bangapani	Gauri Ganga	MGD-1, Lucknow	Uttarakhand	Pithoragarh	-	-	680
31	Banjari	Sone	LGD-2, Patna	Bihar	Rohtas	*	3500	2200

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
32	Banka	Chandan	LGD-2, Patna	Bihar	Banka	*	1083	775
33	Bansi	Rapti	MGD-1, Lucknow	Uttar Pradesh	Siddharth nagar	700	940	920
34	Baranwada	Banas	CD, Jaipur	Rajasthan	Sawai-madhopur	*	16482	11100
35	Bareilly	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	*	13000	14000
36	Barod	Kalisindh	CD, Jaipur	Rajasthan	Kota	10255	14260	16000
37	Basantpur (Ganga)	Ganga	MGD-2, Lucknow	Uttar Pradesh	Bijnaur	*	1900	2700
38	Basoda	Betwa	LYD, Agra	Madhya Pradesh	Vidisha	3093	2233	1783
39	Basti	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	*	1100	*
40	Basti D/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	*	4500	*
41	Basti U/S	Kwano	MGD-1, Lucknow	Uttar Pradesh	Basti	*	1100	*
42	Bawapuram	Tungabhadra	LKD, Hyderabad	Andhra Pradesh	Kurnool	1100	3471	6450
43	Beki Road Bridge	Beki	MBD, Guwahati	Assam	Barpeta	3500	-	-
44	Belne Bridge	Gad	CD, Bengaluru	Maharashtra	Sindudurg	9690	12650	4350
45	Bendrahalli	Suvarnavathi	CD, Bengaluru	Karnataka	Chamaraja Nagar	206667	21780	13780
46	Bhadana Village D/s of Kota City	Chambal	CD, Jaipur	Rajasthan	Kota	*	14429	*
47	Bhadrachalam	Godavari	LGD, Hyderabad	Telangana	Bhadradri-Kothagudem	1127	3179	4500
48	Bhatpalli	Peddavagu	WD, Nagpur	Telangana	Adilabad	571	1857	1650
49	Bhind	Kunwari	LYD, Agra	Madhya Pradesh	Bhind	3133	2943	3200
50	Bhitaura	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehpur	4600	*	4500
51	Bigod	Banas	CD, Jaipur	Rajasthan	Bhilwara	*	8880	10060
52	Birdghat	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	2600	8000	*
53	Bithoor	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	2200	3600	3100
54	Buxar	Ganga	LGD-2, Patna	Bihar	Buxar	-	1515	1717
55	Byaladahalli	HARIDRA	CD, Bengaluru	Karnataka	Davanagere	*	31040	4130
56	Chaklagaon	Manas NH Xing	MBD, Guwahati	Assam	Bongaigaon	3400	-	-
57	Chandrika Devi	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	2300	1700	3400
58	Changsari	Kurijali	MBD, Guwahati	Assam	Kamrup (Rural)	-	1097	1822
59	Chindnar	Indravathi	LGD, Hyderabad	Chhattisgarh	Dantewara	1314	2839	3367
60	Chitrasani	Balaram	MD, Gandhinagar	Gujarat	Banaskantha	*	3233	*
61	Chittorgarh	Gambhiri	CD, Jaipur	Rajasthan	Chittorgarh	*	26000	*
62	Cholachaguddа	MALAPRABHA	CD, Bengaluru	Karnataka	Bagalkot	*	641143	34000
63	Chopan	Sone	MGD-3, Varanasi	Uttar Pradesh	Sonebhadra	1202	561	643
64	Chunchanakatte	Cauvery	CD, Bengaluru	Karnataka	Mysore	39650	10980	3350
65	D/S (Ashti)	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	2300	1622	1180
66	Dabri	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Shajahanpur	*	7800	14000
67	Dadri	Sahibi	UYD, Delhi	Haryana	Dadri	*	17500	*

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
68	Dameracherla	Musi	LKD, Hyderabad	Telangana	Nalgonda	790	4833	9067
69	Daund	Bhima	UKD, Pune	Maharashtra	Pune	*	21143	*
70	Delhi Railway Bridge	Yamuna	UYD, Delhi	Delhi	North Delhi	5557143	1494000	1346667
71	Deongaon Bridge	Bhima	LKD, Hyderabad	Karnataka	Bijapur	*	3388	9750
72	Deosugur	Musi	LKD, Hyderabad	Karnataka	Raichur	1100	2993	5800
73	Derol Bridge	Sabarmati	MD, Gandhinagar	Gujarat	Sabarkantha	3390	3278	3033
74	Dhalegaon	Godavari	UGD, Hyderabad	Maharashtra	Parbhani	-	3603	5083
75	Dhaneta	Baigul/Kicha	MGD-2, Lucknow	Uttar Pradesh	Moradabad	*	7800	11000
76	Dhansa	Sahibi	UYD, Delhi	Haryana	Jhjjar	*	120167	*
77	Dhareri	Chambal	CD, Jaipur	Madhya Pradesh	Ujjain	*	230000	*
78	Dholpur	Chambal	LYD, Agra	Rajasthan	Dholpur	6517	1964	2800
79	Dobhi	Phalgu	LGD-2, Patna	Bihar	Gaya	*	1990	2350
80	Duddhi	Kanhar	MGD-3, Varanasi	Uttar Pradesh	Sonebhadra	963	695	867
81	Dudhnoi	Dudhnai	MBD, Guwahati	Assam	Goalpara	-	1147	760
82	Elgin bridge	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Barabanki	630	940	*
83	Elunuthimang alam	Noyyal	SRD, Coimbatore	Tamil Nadu	Erode	1451	2092	1700
84	Etawah	Yamuna	LYD, Agra	Uttar Pradesh	Etawah	437500	88889	111500
85	Faizabad U/S	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Ayodhya	*	1100	*
86	Fatehgarh	Ganga	MGD-2, Lucknow	Uttar Pradesh	Farukkhabad	1200	2150	*
87	G.R. Bridge	Godavari	UGD, Hyderabad	Maharashtra	Parbhani	-	3369	3860
88	Gaisabad	Bearma	LYD, Agra	Madhya Pradesh	Damoh	*	1900	1733
89	Galeta	Hindon	UYD, Delhi	Uttar Pradesh	Meerut	4114286	420800	1130000
90	Gandhavayal	Gandhayar	SRD, Coimbatore	Tamil Nadu	Coimbatore	770	1074	1400
91	Gandhighat	Ganga	LGD-2, Patna	Bihar	Patna	698	1779	1692
92	Gandlapet	Peddavagu	UGD, Hyderabad	Telangana	Nizamabad	652	4020	3150
93	Ganguwala	Bata	UYD, Delhi	Himachal Pradesh	Sirmaur	9779	9440	6983
94	Ganod	Bhadar	MD, Gandhinagar	Gujarat	Rajkot	*	3500	2783
95	Garhakota	Sonar	LYD, Agra	Madhya Pradesh	Sagar	*	9300	*
96	Garhmuktesh war	Ganga	MGD-2, Lucknow	Uttar Pradesh	Hapur	530	670	680
97	Garhwa	North Koel	LGD-2, Patna	Jharkhand	Palamu	*	1633	1500
98	Garrauli	Dhasan	LYD, Agra	Madhya Pradesh	Chhattarpur	3275	1880	1487
99	Gaya	Phalgu	LGD-2, Patna	Bihar	Gaya	*	1700	1250
100	Ghazipur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Ghazipur	3367	2167	2767
101	Gokak	Ghataprabha	CD, Bengaluru	Karnataka	Belgaum	36000	437507	8880
102	Gokul barrage Mathura D/S	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	1964286	1306000	325000
103	Gomti Nagar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	94000	59500	79000
104	Gorakhpur D/S	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	*	13500	*

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
105	Gorakhpur U/S	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	*	10150	*
106	Gudam Bridge	Pranhita	WD, Nagpur	Maharashtra	Gadchiroli	-	629	1533
107	Gummanur	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	1448	2770	1102
108	Guwahati D.C.Court	Brahmaputra	MBD, Guwahati	Assam	Kamrup (Metro)	-	1854	572
109	Halia	Halia	LKD, Hyderabad	Telangana	Nalgonda	*	5725	6317
110	Hamirpur	Yamuna	LYD, Agra	Uttar Pradesh	Hamirpur	41200	15222	3067
111	Haralahalli	Tungabhadra	CD, Bengaluru	Karnataka	Haveri	23000	36540	3470
112	Hariharapura	Tunga	CD, Bengaluru	Karnataka	Chikamagaluru	40467	35180	3500
113	Haripur	Tons	UYD, Delhi	Uttarakhand	Dehradun	7500	8187	5567
114	Hathidah	Ganga	LGD-2, Patna	Bihar	Patna	-	1884	1930
115	Hathikhana	Ganga	MGD-2, Lucknow	Uttar Pradesh	Fatehgarh	*	3700	3300
116	Hivra	Wardha	WD, Nagpur	Maharashtra	Wardha	-	2148	600
117	Hogenakkal	Chinnar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	*	1400	1700
118	Holehonnur	Bhadra	CD, Bengaluru	Karnataka	Shimoga	13707	23460	4970
119	Honnali	Tungabhadra	CD, Bengaluru	Karnataka	Davanagere	14213	25287	6633
120	Huvinhedgi	Krishna	LKD, Hyderabad	Karnataka	Raichur	935	3857	6033
121	Irrukkankudi	Vaippar	SRD, Coimbatore	Tamil Nadu	Virudhunagar	1276	*	775
122	Jagdalpur	Indravathi	LGD, Hyderabad	Chhattisgarh	Bastar	1093	2979	4433
123	Jajmau	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	4700	7000	9200
124	Japla	Sone	LGD-2, Patna	Jharkhand	Palamu	*	1593	875
125	Jaunpur	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	2693	1993	2200
126	Jawahar Bridge, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	198333	175000	63500
127	Jhalawar	Kalisindh	CD, Jaipur	Rajasthan	Jhalawar	*	9280	*
128	Jhansi-Mirzapur Highway Road Bridge, (Sahijina D/S)	Betwa	LYD, Agra	Uttar Pradesh	Hamirpur	2909	1989	1650
129	K M Vadi	Cauvery/ Lakshmanthirth	CD, Bengaluru	Karnataka	Mysore	85400	388800	12700
130	K.T.(Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	8633	5657	2750
131	Kachlabridge	Ganga	MGD-2, Lucknow	Uttar Pradesh	Badaun	615	730	1200
132	Kailash Mandir, (Agra U/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	227500	154444	97500
133	Kalanaur	Yamuna	UYD, Delhi	Uttar Pradesh	Saharanpur	12586	10567	7683
134	Kalpi	Yamuna	LYD, Agra	Uttar Pradesh	Jalaun	50218	39413	2383
135	Kamalpur	Banas	MD, Gandhinagar	Gujarat	Banaskantha	*	3775	*
136	Kannauj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kannauj	*	9200	4500
137	Kanpur	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	4400	3100	4500
138	Karad	Krishna	UKD, Pune	Maharashtra	Satara	*	17000	4000
139	Karnal	Yamuna	UYD, Delhi	Haryana	Karnal	21429	11347	6500
140	Kasganj	Kali	MGD-2, Lucknow	Uttar Pradesh	Kasganj	*	12000	9200

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
141	Katri Umrauli	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kannauj	*	4500	4000
142	Kazipura	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Moradabad	*	11000	*
143	Keesara	Munneru	LKD, Hyderabad	Andhra Pradesh	Krishna	*	4490	3150
144	Kellodu	VEDAVATHI	CD, Bengaluru	Karnataka	Chitradurga	350000	44867	10000
145	Keolari	Wainganga	WD, Nagpur	Madhya Pradesh	Seoni	-	2117	1658
146	Khanpur	Mahi	MD, Gandhinagar	Gujarat	Anand	3340	3620	3650
147	Khatoli	Parwati	CD, Jaipur	Rajasthan	Kota	11391	12145	12800
148	Khudrakhowa	Manas NH Xing	MBD, Guwahati	Assam	Barpeta	16000	560	-
149	Kodumudi	Cauvery	SRD, Coimbatore	Tamil Nadu	Erode	1048	1035	832
150	Koelwar	Sone	LGD-2, Patna	Bihar	Bhojpur	*	2183	1075
151	Koggedoddi	Arkavathi	CD, Bengaluru	Karnataka	Ramanagara	177733	277453	4900
152	Kokiwada	Pench	WD, Nagpur	Madhya Pradesh	Chhindwara	996	1050	-
153	Kollegala	Cauvery	CD, Bengaluru	Karnataka	Chamaraja Nagar	18438	13836	7280
154	Konta	Sabari	LGD, Hyderabad	Chhattisgarh	Sukma	1006	3121	4120
155	Kopergaon	Godavari	UGD, Hyderabad	Maharashtra	Ahmednagar	*	6444	*
156	Kora	Rind	LYD, Agra	Uttar Pradesh	Fatehpur	2804	2486	1633
157	Kota-By Pass Hanging Road Bridge U/S of Kota City	Chambal	CD, Jaipur	Rajasthan	Kota	*	15517	*
158	Kudige	Cauvery	CD, Bengaluru	Karnataka	Kodagu	53333	379693	11833
159	Kudlur	Palar	SRD, Coimbatore	Tamil Nadu	Chamarajanagara	*	1400	680
160	Kuldahbridge	Sone	MGD-3, Varanasi	Madhya Pradesh	Sidhi	1635	879	1100
161	Kulsi	Kulsi	MBD, Guwahati	Assam	Kamrup	1300	1638	-
162	Kumhari	Wainganga	WD, Nagpur	Madhya Pradesh	Balaghat	-	1760	790
163	Kuppellur	KUMUDVATHI	CD, Bengaluru	Karnataka	Haveri	*	32280	4850
164	Kurundwad	Krishna	UKD, Pune	Maharashtra	Kolhapur	*	5886	7000
165	Lakhisarai	Kiul	LGD-2, Patna	Bihar	Lakhisarai	*	2800	-
166	Lakkavalli	Bhadra	CD, Bengaluru	Karnataka	Chikmagalur	10267	20947	6780
167	Lakshmanapatti	Kodaganar	SRD, Coimbatore	Tamil Nadu	Dindigul	832	1265	745
168	Lalganj	Gandak	LGD-2, Patna	Bihar	Vaishali	*	2340	1100
169	Lalpur	Sengar	LYD, Agra	Uttar Pradesh	Kanpur Dehat	3982	7300	1867
170	Lodhikheda	Jam	WD, Nagpur	Madhya Pradesh	Chhindwara	2487	2101	2030
171	Lucknow	Gomti	MGD-2, Lucknow	Uttar Pradesh	Lucknow	45333	28500	47000
172	Luwara	Shetrunji	MD, Gandhinagar	Gujarat	Bhavnagar	3556	3114	2750
173	M H Halli	Hemavathy	CD, Bengaluru	Karnataka	Hassan	18114	9433	1660
174	Madhira	Wyra	LKD, Hyderabad	Telangana	Khammam	790	5830	5283
175	Madla	Ken	LYD, Agra	Madhya Pradesh	Panna	*	1460	2000
176	Magardhara	Wainganga	WD, Nagpur	Maharashtra	Balaghat	-	1100	987
177	Mahalgaon	Wainganga	WD, Nagpur	Maharashtra	Gondia	533	1009	-

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
178	Mahidpur	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	31480	*
179	Maighat	Gomti	MGD-3, Varanasi	Uttar Pradesh	Jaunpur	2260	1680	2317
180	Malkhed	Bhima	LKD, Hyderabad	Karnataka	Gulbarga	684	3792	4850
181	Manas NH Xing	Manas NH Xing	MBD, Guwahati	Assam	Bongaigaon	9000	1740	883
182	Mancherial	Godavari	UGD, Hyderabad	Telangana	Adilabad	1045	3364	3900
183	Mandawara	Chambal	CD, Jaipur	Rajasthan	Kota	13600	13707	16667
184	Manderial	Chambal	CD, Jaipur	Rajasthan	Karauli	17743	12460	10567
185	Mangaon	Kal	UKD, Pune	Maharashtra	Raigad	*	5015	3000
186	Manjhi	Ghaghra	LGD-2, Patna	Bihar	Saran	*	3300	940
187	Mantralayam	Tungabhadra	LKD, Hyderabad	Andhra Pradesh	Kurnool	*	3948	4750
188	Marella	Gundakamma	LKD, Hyderabad	Andhra Pradesh	Prakasam	*	5929	2833
189	Marol	Varada	CD, Bengaluru	Karnataka	Haveri	*	48900	14400
190	Mataji	Mahi	MD, Gandhinagar	Madhya Pradesh	Ratlam	2550	3083	3000
191	Mawi	Yamuna	UYD, Delhi	Uttar Pradesh	Muzaffar Nagar	194857	57800	5483
192	Mehandipur	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kannauj	*	8000	*
193	Mejaroad	Tons	MGD-3, Varanasi	Uttar Pradesh	Allahabad	1257	1066	1072
194	Mirzapur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Mirzapur	2500	2000	1883
195	Mohana	Betwa	LYD, Agra	Uttar Pradesh	Jalaun	2785	2478	11183
196	Mohna	Yamuna	UYD, Delhi	Haryana	Faridabad	3049286	1181333	458333
197	Moradabad	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Moradabad	*	13000	11000
198	Mungoli	Penganga	WD, Nagpur	Maharashtra	Yavatmal	757	1137	1990
199	Munugodu	Edduvagu	LKD, Hyderabad	Andhra Pradesh	Guntur	-	4067	3900
200	Muradpur	Vashishti	UKD, Pune	Maharashtra	Ratnagiri	*	25462	*
201	Murappanadu	Tambraparani	SRD, Coimbatore	Tamil Nadu	Tuticorin	812	845	723
202	Musiri	Cauvery	SRD, Coimbatore	Tamil Nadu	Thiruchirapalli	1185	668	1185
203	Muthankera	Kabini	CD, Bengaluru	Kerala	Wayanad	72267	391153	5800
204	Nagothane	Amba	UKD, Pune	Maharashtra	Raigad	*	9508	*
205	Nallamaranpatty	Amaravathi	SRD, Coimbatore	Tamil Nadu	Karur	883	795	653
206	Nanded	Godavari	UGD, Hyderabad	Maharashtra	Nanded	1183	3093	8267
207	Nandgaon	Wunna	WD, Nagpur	Maharashtra	Wardha	1341	2375	1053
208	Nasik	Godavari	UGD, Hyderabad	Maharashtra	Nasik	1279	3933	8567
209	Naugaon	Yamuna	UYD, Delhi	Uttarakhand	Uttarakashi	7657	8027	6217
210	Neemsar	Gomti	MGD-2, Lucknow	Uttar Pradesh	Sitapur	930	1040	*
211	Noida	Hindon	UYD, Delhi	Uttar Pradesh	Gautam Budh Nagar	6607143	1146667	668333
212	Nona	Nona	MBD, Guwahati	Assam	Nalbari	800	-	1592
213	Nowrangpur	Indravathi	LGD, Hyderabad	Odisha	Nowrangpur	1304	2839	4000
214	Odenthurai	Kallar	SRD, Coimbatore	Tamil Nadu	Coimbatore	765	1011	1010
215	Orai-Rath Marg, Chikasi (Sahijina U/S)	Betwa	LYD, Agra	Uttar Pradesh	Jalaun	3764	2033	4583

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
216	P.G.Bridge	Penganga	WD, Nagpur	Maharashtra	Yavatmal	-	1793	2693
217	Pachawali	Sindh	LYD, Agra	Madhya Pradesh	Shivpuri	*	1216	*
218	Pachegaon	Pravara	UGD, Hyderabad	Maharashtra	Ahmednagar	*	3800	*
219	Padardibadi	Mahi	MD, Gandhinagar	Rajasthan	Dungarpur	3580	3020	3750
220	Pagladiya	Pagladiya	MBD, Guwahati	Assam	Nalbari	*	2860	-
221	Paleru Bridge	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	*	5420	7617
222	Pali	Chambal	CD, Jaipur	Rajasthan	Sawai-madhopur	15093	11527	10467
223	Paliakalan	Sharda	MGD-1, Lucknow	Uttar Pradesh	Lakhimpur Kheri	*	1240	*
224	Palla	Yamuna	UYD, Delhi	Delhi	North West Delhi	324143	236000	109333
225	Pancharatna	Brahmaputra	MBD, Guwahati	Assam	Goalpara	2400	-	-
226	Paramakudi	Vaigai	SRD, Coimbatore	Tamil Nadu	Ramanathapuram	633	1100	868
227	Pargaon	Bhima	UKD, Pune	Maharashtra	Pune	*	6721	*
228	Parmat ghat	Ganga	MGD-2, Lucknow	Uttar Pradesh	Kanpur	3400	3950	4500
229	Parsohan ghat	Burhi Rapti	MGD-1, Lucknow	Uttar Pradesh	Sidharthnagar	1100	1200	1400
230	Patala	Wardha	WD, Nagpur	Maharashtra	Chandrapur	1671	1706	-
231	Patansaongi	Chandrabhaga	WD, Nagpur	Maharashtra	Nagpur	1744	2391	1407
232	Pathagudem	Indravathi	LGD, Hyderabad	Chhattisgarh	Dantewara	1000	3195	3683
233	Pauni	Wainganga	WD, Nagpur	Maharashtra	Bhandara	916	1755	1312
234	Perur	Godavari	UGD, Hyderabad	Telangana	Mulugu	969	2879	3800
235	Phulgaon	Bhima	UKD, Pune	Maharashtra	Pune	*	2817	*
236	Poanta	Yamuna	UYD, Delhi	Himachal Pradesh	Simaur	6700	9920	11267
237	Poiyaghat, Agra	Yamuna	LYD, Agra	Uttar Pradesh	Agra	206667	194444	109167
238	Polavaram	Godavari	LGD, Hyderabad	Andhra Pradesh	West Godavari	880	3186	2933
239	Pratap pur	Yamuna	LYD, Agra	Uttar Pradesh	Prayagraj	4975	3989	2500
240	Pratapgarh	Sai	MGD-3, Varanasi	Uttar Pradesh	Pratapgarh	2067	1332	1685
241	Pratappur	Pravara	UGD, Hyderabad	Maharashtra	Ahmednagar	1400	4367	5400
242	Purna	Purna	UGD, Hyderabad	Maharashtra	Parbhani	1700	3731	6667
243	Puthimari	Puthimari	MBD, Guwahati	Assam	Kamrup	-	2194	-
244	Rahu	Bhima	UKD, Pune	Maharashtra	Pune	*	7000	*
245	Rai Bareli	Sai	MGD-2, Lucknow	Uttar Pradesh	Rae Bareili	1000	1440	1700
246	Rajahmundry	Godavari	LGD, Hyderabad	Andhra Pradesh	East Godavari	891	3714	4767
247	Rajapur	Yamuna	LYD, Agra	Uttar Pradesh	Chitrakoot	5558	4467	3233
248	Rajegaon	Bagh	WD, Nagpur	Madhya Pradesh	Balaghat	600	2200	623
249	Rajghat (Agra)	Betwa	LYD, Agra	Uttar Pradesh	Lalitpur	2784	1668	1783
250	Ramakona	Kanhan	WD, Nagpur	Madhya Pradesh	Chhindwara	-	2066	720
251	Rangeli	Som	MD, Gandhinagar	Rajasthan	Dungarpur	3473	3160	3133
252	Regauli	Rapti	MGD-1, Lucknow	Uttar Pradesh	Gorakhpur	2100	2200	3300
253	Renukaji	Giri	UYD, Delhi	Himachal	Sirmaur	6964	8153	9400

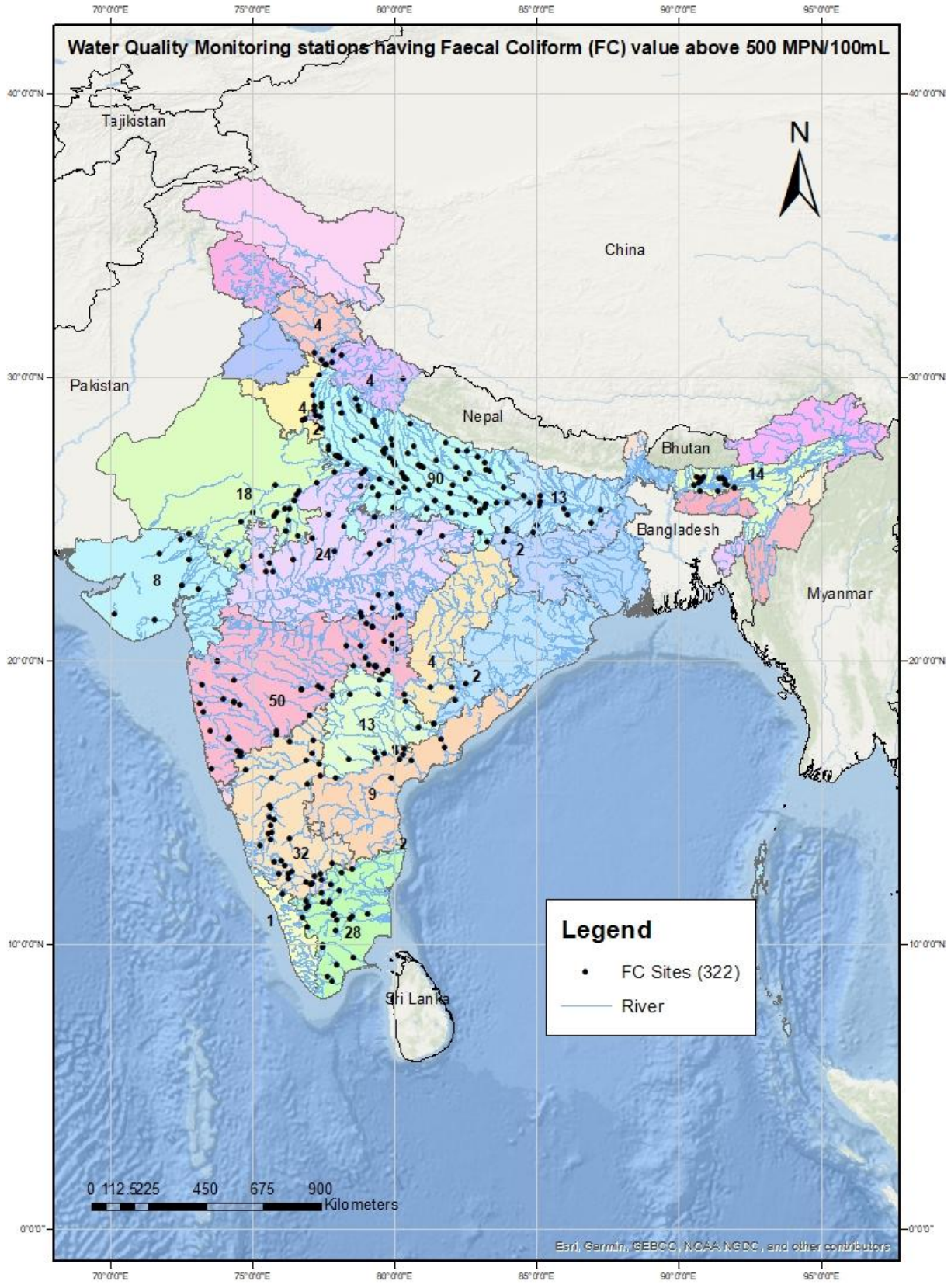
S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
				Pradesh				
254	Sahijana	Betwa	LYD, Agra	Uttar Pradesh	Hamirpur	2990	1622	2858
255	Saidpur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Ghazipur	2707	1953	2083
256	Saigaon	Manjera	UGD, Hyderabad	Karnataka	Bidar	*	4418	2800
257	Sakhara	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	2077	2025	1505
258	Sakleshpura	Hemavathi	CD, Bengaluru	Karnataka	Hassan	19364	40380	10900
259	Sakmur	Wardha	WD, Nagpur	Maharashtra	Chandrapur	-	1118	-
260	Salebardi	Chulband	WD, Nagpur	Maharashtra	Bhandara	648	956	-
261	Saloora	Godavari	UGD, Hyderabad	Telangana	Nizamabad	590	2185	3267
262	Samdoli	Warana	UKD, Pune	Maharashtra	Sangli	*	4514	3917
263	Sangam (LGD)	Kinnersani	LGD, Hyderabad	Telangana	Bhadradri-Kothagudem	1021	2959	4220
264	Sangod	Parwan	CD, Jaipur	Rajasthan	Kota	*	9911	*
265	Saradaput	Sabari	LGD, Hyderabad	Odisha	Malkangiri	934	3116	3133
266	Sarangpur	Kalisindh	CD, Jaipur	Madhya Pradesh	Rajgarh	*	25143	*
267	Sarati	Nira	UKD, Pune	Maharashtra	Solapur	*	2144	*
268	Satna	Tons	MGD-3, Varanasi	Madhya Pradesh	Satna	1478	854	915
269	Satrapur	Kanhan	WD, Nagpur	Maharashtra	Nagpur	1119	4457	1427
270	Savandapur	Bhavani	SRD, Coimbatore	Tamil Nadu	Erode	759	1051	985
271	Seohara	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bijnaur	*	12500	11000
272	Seondha	Sindh	LYD, Agra	Madhya Pradesh	Datia	2538	1620	1867
273	Sevanur	Chittar	SRD, Coimbatore	Tamil Nadu	Erode	*	1370	1517
274	Shahjahanpur	Khannaut	MGD-2, Lucknow	Uttar Pradesh	Shahjahanpur	*	17000	13000
275	Shahzadpur	Ganga	MGD-3, Varanasi	Uttar Pradesh	Kaushambi	1900	1525	1655
276	Shastri Bridge	Ganga	MGD-3, Varanasi	Uttar Pradesh	Allahabad	2327	1847	1800
277	Shimoga	Tunga	CD, Bengaluru	Karnataka	Shimoga	50333	56938	3750
278	Singasadanapalli	Ponnaiyar	SRD, Coimbatore	Tamil Nadu	Dharmapuri	892000	1845333	578333
279	Sitapur	sarayan	MGD-2, Lucknow	Uttar Pradesh	Sitapur	680	903	*
280	Sonapur	Digaru	MBD, Guwahati	Assam	Kamrup	*	1573	-
281	Sripalpur	Punpun	LGD-2, Patna	Bihar	Patna	*	2200	1040
282	Suddakallu	Dindi	LKD, Hyderabad	Telangana	Mahaboob Nagar	631	8986	4433
283	Sultanpur	Gomti	MGD-3, Varanasi	Uttar Pradesh	Sultanpur	3053	2113	2000
284	T Bekuppe	Arkavathy	CD, Bengaluru	Karnataka	Ramanagara	144333	304547	19867
285	T K Halli	Shimsha	CD, Bengaluru	Karnataka	Mandya	*	14600	16667
286	T Narsipura	Kabini	CD, Bengaluru	Karnataka	Mysore	14920	12213	6660
287	T.Ramapuram	Hagari	LKD, Hyderabad	Karnataka	Bellary	790	3600	4117
288	Takali	Bhima	UKD, Pune	Maharashtra	Solapur	*	2967	*
289	Tal	Chambal	CD, Jaipur	Madhya Pradesh	Ratlam	*	15625	*
290	Terwad	Panchganga	UKD, Pune	Maharashtra	Kolhapur	*	11879	5500
291	Thandalaiputh	Ayyar	SRD,	Tamil Nadu	Thiruchirapalli	*	*	877

S. No.	Water Quality Stations	River/ Reservoir	Division	State	District	Pre Monsoon	Monsoon	Post Monsoon
	ur		Coimbatore					
292	Thengumarahada	Bhavani/Moyar	SRD, Coimbatore	Tamil Nadu	Nilgiris	522	1144	637
293	Theni	Suruliyar	SRD, Coimbatore	Tamil Nadu	Theni	972	608	1167
294	Thevur	Sarabenga	SRD, Coimbatore	Tamil Nadu	Salem	615	1869	1157
295	Thimmanahalli	Yagachi	CD, Bengaluru	Karnataka	Hassan	27333	24427	5167
296	Thoppur	Thoppaiyar	SRD, Coimbatore	Tamil Nadu	Salem	*	*	1593
297	Tiharkhera	Ramganga	MGD-2, Lucknow	Uttar Pradesh	Bareilly	*	4500	12000
298	Tondarpur	Sukheta	MGD-2, Lucknow	Uttar Pradesh	Hardoi	*	11000	9300
299	Tonk	Banas	CD, Jaipur	Rajasthan	Tonk	*	18818	*
300	Tuini	Tons	UYD, Delhi	Uttarakhand	Dehradun	8914	7867	6600
301	Turtipar	Ghaghra	MGD-1, Lucknow	Uttar Pradesh	Ballia	8100	4600	9400
302	U/S (Bamni)	Wardha	WD, Nagpur	Maharashtra	Chandrapur	2409	3240	1473
303	U/S (Satrapur)	Kanhan	WD, Nagpur	Maharashtra	Nagpur	3567	3293	2433
304	Udi	Chambal	LYD, Agra	Uttar Pradesh	Etawah	7900	2411	2567
305	Ujjain	Shipra	CD, Jaipur	Madhya Pradesh	Ujjain	*	91833	78000
306	Urachikottai	Cauvery	SRD, Coimbatore	Tamil Nadu	Erode	775	777	848
307	V.S. Bridge	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	2720	2013	1817
308	Valigonda	Musi	LKD, Hyderabad	Telangana	Nalgonda	1620	5554	13280
309	Varanasi	Ganga	MGD-3, Varanasi	Uttar Pradesh	Varanasi	2787	2260	2300
310	Varanavasi	Marudaiyar	SRD, Coimbatore	Tamil Nadu	Perambalur	1100	*	1058
311	Vautha	Sabarmati	MD, Gandhinagar	Gujarat	Ahmedabad	54733	51533	51500
312	Vijayawada	Krishna	LKD, Hyderabad	Andhra Pradesh	Krishna	1091	4471	3800
313	Vrindawan Bridge (Mathura U/S)	Yamuna	UYD, Delhi	Uttar Pradesh	Mathura	383000	151933	75667
314	Wadakbal	Sina	UKD, Pune	Maharashtra	Solapur	*	29636	22000
315	Wadenapalli	Krishna	LKD, Hyderabad	Telangana	Nalgonda	893	3321	6667
316	Wairagarh	Wainganga	WD, Nagpur	Maharashtra	Gadchiroli	-	1477	1217
317	Warunji	Koyna	UKD, Pune	Maharashtra	Satara	*	3300	2300
318	Watrak Nr Vautha	Watrak	MD, Gandhinagar	Gujarat	Ahmedabad	*	3300	*
319	Yadgir	Bhima	LKD, Hyderabad	Karnataka	Gulbarga	*	4077	5400
320	Yamuna Expressway Road Bridge, Etamadpur (Agra D/S)	Yamuna	LYD, Agra	Uttar Pradesh	Agra	234167	244222	48833
321	Yashwant Nagar	Giri	UYD, Delhi	Himachal Pradesh	Simaur	9850	9880	9100
322	Yelli	Godavari	UGD, Hyderabad	Maharashtra	Nanded	1241	2973	4333

(-) means No Hotspot.

(*) means river dry/data not available.

Figure 27: Water Quality Monitoring stations having Faecal Coliform (FC) above 500 MPN/100ml (2024)



7.1.13 Sodium Adsorption Ratio (SAR)

Sodium adsorption ratio (SAR) is an irrigation water quality parameter used in the management of sodium-affected soils. It is an indicator of the suitability of water for use in agricultural irrigation, as determined from the concentrations of the main alkaline and earth alkaline cations present in the water. It is also a standard diagnostic parameter for the sodicity hazard of a soil as determined from analysis of pore water extracted from the soil. SAR is a measure of the amount of sodium (Na^+) relative to calcium (Ca^{2+}) and magnesium (Mg^{2+}) in the water extracted from a saturated soil paste.

Soils that have values for sodium adsorption ratio of 13 or more may have an increased dispersion of organic matter and clay particles, reduced saturated hydraulic conductivity and aeration, and a general degradation of soil structure.

SAR allows assessment of the state of flocculation or of dispersion of clay aggregates in a soil. Sodium and potassium ions facilitate the dispersion of clay particles while calcium and magnesium promote their flocculation. The behaviour of clay aggregates influences the soil structure and affects the permeability of the soil whose directly depends on the water infiltration rate. It is important to accurately know the nature and the concentrations of cations at which the flocculation occurs: critical flocculation concentration (CFC). The SAR parameter is also used to determine the stability of colloids in suspension in water.

Although SAR is only one factor in determining the suitability of water for irrigation, in general, the higher the sodium adsorption ratio, the less suitable the water is for irrigation. Irrigation using water with high sodium adsorption ratio may require soil amendments to prevent long-term damage to the soil.

In 2024, the pre-monsoon, monsoon, and post-monsoon seasons consistently demonstrated that the average values of SAR (Sodium Adsorption Ratio) at all water quality monitoring stations remained within the permissible limit of Class E, as designated by the Central Pollution Control Board (CPCB) for the best uses of water. This observation indicates that the levels of sodium relative to other ions in the water were within the acceptable range, suggesting no significant deterioration in water quality with respect to SAR during these periods.

CHAPTER – 8

COMPARISON STUDY (PARAMETER VALUES) - HOT SPOTS IN (JANUARY-DECEMBER, 2023) WITH (JANUARY-DECEMBER, 2024)

Comparison has been done among the water quality hotspots observed for the period January-December, 2023 with the average values of pre-monsoon, monsoon and post monsoon from January-December, 2024 of 11 parameters (pH, EC, DO, BOD, TC, FC, Fluoride, Nitrate as N, Chloride, Total Hardness and Ammonia as N). The summary is as under:

8.1 pH

The comparison of hotspots at various monitoring stations along rivers during the years 2023 and 2024 reveals significant changes in water quality and environmental conditions. The assessment considered pre-monsoon (Pre-M), monsoon (M) and post-monsoon (post-M) periods to capture seasonal variations and their impact on the identified hotspots. In 2023, 23 water quality monitoring stations were identified as hotspots during the pre-monsoon, monsoon, and post-monsoon periods, while in 2024, 30 water quality stations were observed as hotspots. These hotspots were compared with the average values of the pre-monsoon, monsoon, and post-monsoon periods of January to December 2024. Seven (07) water quality stations, namely Barod, Kharkhana, Maighat, Mantralayam, Padardibadi, Palakkadavu, and Pratapgarh located along seven rivers (Kalisindh, Myntdu, Gomti, Tungabhadra, Mahi, Karuvannur and Sai) were identified as common hotspot stations during 2023 and 2024.

Several monitoring stations showed improvement while some demostrated detoriation in water quality from 2023 to 2024. For instance, 12 monitoring stations on 12 rivers experienced tremendous improvement to No-Hotspots in 2024 as compared to 2023 such as Bamnidhi (Hasdeo river) during all seasons. 01 monitoring station Kharkhana (Myntdu River) demonstrated improvement but Hotspot throughout all seasons. Conversely, 01 monitoring station Barod (Kalisindh River) experienced deterioration in water quality in all seasons. No monitoring station emerged as New Hotspots in all seasons.

During pre-monsoon season, 17 monitoring stations on 15 rivers like Bhind (Kunwari river) demonstrated No-Hotspots in 2024 as compared to 2023. 4 monitoring stations on 4 rivers like Maighat (River Gomti) showed signs of improvement but still a Hotspot. 6 monitoring stations on 6 rivers like Barod (Kalisindh River) deteriorated in water quality indicating persistent environmental challenges and potential anthropogenic influences exacerbating water pollution while 9 monitoring stations on 8 rivers like Gandlapet (Peddavagu river) emerged as New Hotspots.

During monsoon season, 34 monitoring stations on 28 rivers like Derol Bridge (Sabarmati River) showed No-Hotspots in 2024 as compared to 2023. 2 monitoring stations on 2 rivers like Kharkhana (Myntdu River) showed signs of improvement but still a Hotspot. 1 monitoring station Barod (Kalisindh River) deteriorated in water quality while 6 monitoring stations on 5 rivers like Baranwada (Banas River) emerged as New Hotspots.

During post-monsoon season, 34 monitoring stations on 28 rivers like Derol Bridge (Sabarmati River) showed No-Hotspots in 2024 as compared to 2023. 2 monitoring stations on 2 rivers like Kharkhana (Myntdu River) showed signs of improvement but still a Hotspot. 1 monitoring station Barod (Kalisindh River) deteriorated in water quality while 6 monitoring stations on 5 rivers like Baranwada (Banas River) emerged as New Hotspots.

Table 19: Comparison of pH Hot Spots during year 2023 with 2024

S.No.	Water Quality Monitoring Station	River	State	Pre-M(2023)	M(2023)	Post-M(2023)	Pre-M(2024)	M(2024)	Post-M(2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
1	Aklera	Parwan	Rajasthan	-	8.31	*	*	8.62	*	*	NHS	*
2	Avershe	Seetha	Karnataka	-	6.38	6.43	*	6.61	6.62	*	NoHS	NoHS
3	Bamnidhi	Hasdeo	Chhattisgarh	8.53	-	-	8.22	-	-	NoHS	NoHS	NoHS
4	Baranwada	Banas	Rajasthan	*	8.17	*	*	8.51	8.25	*	NHS	*
5	Barod	Kalisindh	Rajasthan	8.60	8.52	8.62	8.89	8.65	8.72	D	D	D
6	Bawapuram	Tungabhadra	Andhra Pradesh	8.52	-	8.21	7.98	-	8.51	NoHS	NoHS	NHS
7	Bhadrachalam	Godavari	Telangana	8.53	-	8.38	8.53	-	8.51	D	NoHS	NHS
8	Bhind	Kunwari	Madhya Pradesh	8.92	-	-	8.25	-	-	NoHS	NoHS	NoHS
9	Chittorgarh	Gambhiri	Rajasthan	*	*	*	*	8.56	*	*	*	*
10	Dameracherla	Musi	Telangana	8.53	8.54	-	8.45	8.39	-	NoHS	NoHS	NoHS
11	Derol Bridge	Sabarmati	Gujarat	8.74	8.57	-	8.36	8.35	-	NoHS	NoHS	NoHS
12	Gandlapet	Peddavagu	Telangana	8.17	-	-	8.63	-	-	NHS	NoHS	NoHS
13	Jaunpur	Gomti	Uttar Pradesh	8.59	-	8.17	8.44	-	8.64	NoHS	NoHS	NHS
14	Jhalawar	Kalisindh	Rajasthan	*	8.07	*	*	8.55	*	*	NHS	*
15	Jondhra	Seonath	Chhattisgarh	8.82	-	-	8.39	-	-	NoHS	NoHS	NoHS
16	Kallooppara	Manimala	Kerala	6.44	6.42	6.28	6.54	6.55	6.58	NoHS	NoHS	NoHS
17	Kamalpur	Banas	Gujarat	*	8.64	*	*	8.55	*	*	IBHS	*
18	Khanpur	Mahi	Gujarat	8.79	8.56	8.53	8.48	8.48	8.49	NoHS	NoHS	NoHS
19	Kharkhana	Myntdu	Meghalaya	4.15	5.95	4.27	4.97	6.19	4.57	IBHS	IBHS	IBHS
20	Khatoli	Parwati	Rajasthan	-	8.25	-	-	8.54	-	NoHS	NHS	NoHS
21	Koggedoddi	Arkavathy	Karnataka	8.76	8.81	8.61	8.47	8.18	8.16	NoHS	NoHS	NoHS
22	Kuttiyadi	Kuttyadi	Kerala	6.46	6.45	-	6.52	6.57	-	NoHS	NoHS	NoHS
23	Maighat	Gomti	Uttar Pradesh	8.63	-	8.30	8.52	-	8.60	IBHS	NoHS	NHS
24	Malakkara	Pampa	Kerala	-	6.45	6.46	-	6.56	6.64	NoHS	NoHS	NoHS
25	Malkhed	Bhima	Karnataka	8.56	-	-	8.59	-	-	D	NoHS	NoHS

S.No.	Water Quality Monitoring Station	River	State	Pre-M(2023)	M(2023)	Post-M(2023)	Pre-M(2024)	M(2024)	Post-M(2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
26	Mancherial	Godavari	Telangana	8.58	-	-	8.58	-	-	D	NoHS	NoHS
27	Mandawara	Chambal	Rajasthan	8.35	8.36	-	8.61	8.67	-	NHS	NHS	NoHS
28	Manderial	Chambal	Rajasthan	8.38	-	-	8.59	-	-	NHS	NoHS	NoHS
29	Mantralayam	Tungabhadra	Andhra Pradesh	8.65	8.57	8.40	*	8.37	8.56	*	NoHS	NHS
30	Marella	Gundlakamma	Andhra Pradesh	8.61	-	-	*	-	-	*	NoHS	NoHS
31	Munugodu	Edduvagu	Andhra Pradesh	8.40	-	-	8.56	-	-	NHS	NoHS	NoHS
32	Nutanhat	Ajay	West Bengal	8.39	-	-	8.51	-	-	NHS	NoHS	NoHS
33	Padardibadi	Mahi	Rajasthan	8.60	8.66	8.41	8.34	8.41	8.57	NoHS	NoHS	NHS
34	Palakkadavu	Karuvannur	Kerala	6.57	6.47	6.43	6.43	6.55	6.54	NHS	NoHS	NoHS
35	Pali	Chambal	Rajasthan	8.44	8.30	-	8.72	8.60	-	NHS	NHS	NoHS
36	Perur	Godavari	Telangana	8.72	-	-	8.51	-	-	IBHS	NoHS	NoHS
37	Pratapgarh	Sai	Uttar Pradesh	8.61	-	8.58	8.63	-	8.43	D	NoHS	NoHS
38	Purna	Purna	Maharashtra	*	-	-	8.71	-	-	*	NoHS	NoHS
39	Rangeli	Som	Rajasthan	8.57	8.69	8.65	8.32	8.17	8.41	NoHS	NoHS	NoHS
40	Saloora	Godavari	Telangana	8.49	-	-	8.60	-	-	NHS	NoHS	NoHS
41	Suddakallu	Dindi	Telangana	8.56	-	-	8.69	-	-	D	NoHS	NoHS
42	Vazhavachanur	Ponnaiyar	Tamil Nadu	8.59	-	-	8.19	-	-	NoHS	NoHS	NoHS
43	Vijayawada	Krishna	Andhra Pradesh	8.69	-	-	8.67	-	-	IBHS	NoHS	NoHS
44	Villupuram	Ponnaiyar	Tamil Nadu	8.62	-	-	8.39	*	-	NoHS	*	NoHS
45	Wairagarh	Wainganga	Maharashtra	7.90	-	-	6.20	-	-	NHS	NoHS	NoHS

(-) means No Hotspot

(*) means Data not available/ river dry.

No Hot Spot (NoHS) | Deteriorate (D) | New Hotspot (NHS) | Improved but Hotspot (IBHS)

8.2 Electrical Conductivity (EC)

The comparison of hotspots at various monitoring stations along rivers during the years 2023 and 2024 reveals significant changes in river water quality. Specifically, the comparison of water quality hotspots at monitoring stations along the Wardha River in Maharashtra, the Noyyal River in Tamil Nadu and the Shetrunji River in Gujarat during the years 2023 and 2024 shows significant variations in electrical conductivity. In 2023, 6 water quality monitoring stations were identified as hotspots during the pre-monsoon, monsoon, and post-monsoon seasons while in 2024, 11 water quality stations were observed as hotspots.

Four (04) water quality stations - B.P.M. (Bamni) on River Wardha, Lakshmanapatti on River Kodaganar, Luwara on River Shetrunji and Thevur on River Sarabenga - were identified as common hotspot stations during

both years 2023 and 2024. Lakshmanapatti (Kodaganar River) monitoring station showed improvement in water quality but Hotspot throughout all seasons.

During pre-monsoon, 2 monitoring stations on 2 rivers like Durvesh (Vaitarna river) demonstrated No-Hotspots in 2024 as compared to 2023. 1 monitoring station Lakshmanapatti (Kodaganar River) showed improvement but Hotspot. 3 monitoring stations on 3 rivers like Luwara (Shetrunji River) deteriorated in water quality due to potential anthropogenic influences exacerbating water pollution while 2 monitoring stations on 2 rivers like Vautha (Sabarmati River) emerged as New Hotspots.

During monsoon, 6 monitoring stations on 6 rivers like T. Ramapuram (Hagari river) demonstrated No-Hotspots in 2024 as compared to 2023. 2 monitoring stations on 2 rivers like Elunuthi Mangalam (Noyyal River) showed improvement but Hotspot. 1 monitoring stations B.P.M.(Bamni) (Wardha River) showed deterioration while 1 monitoring stations Dhansa Vautha (Sahibi River) emerged as New Hotspot.

During post-monsoon, 4 monitoring stations on 4 rivers like Dhalegaon (Godavari River) demonstrated No-Hotspots in 2024 as compared to 2023. 3 monitoring stations on 3 rivers like Lakshmanapatti (Kodaganar River) showed improvement but Hotspot. 1 monitoring station Elunuthi Mangalam (Noyyal River) deteriorated in water quality due to potential anthropogenic influences while 1 monitoring station Varanavasi (Marudaiyar River) emerged as New Hotspot.

Table 20: Comparison of EC Hot Spots during year 2023 with 2024

S.No.	Water Quality Monitoring Station	River	State	Pre-M(2023)	M(2023)	Post-M(2023)	Pre-M(2024)	M(2024)	Post-M(2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
1	B.P.M. (Bamni)	Wardha	Maharashtra	3978	3455	4519	5110	4142	3507	D	D	IBHS
2	Dadri	Sahibi	Haryana	*	*	*	*	2407	*	*	*	*
3	Dhalegaon	Godavari	Maharashtra	*	-	-	2810	-	-	*	NoHS	NoHS
4	Dhansa	Sahibi	Haryana	*	2117	*	*	2776	*	*	NHS	*
5	Durvesh	Vaitarna	Maharashtra	4520	-	*	462	-	-	NoHS	NoHS	*
6	Elunuthi Mangalam	Noyyal	Tamil Nadu	2574	3292	2290	3336	2618	2335	D	IBHS	D
7	Lakshmanapatti	Kodaganar	Tamil Nadu	3647	5288	4909	2639	3010	3098	IBHS	IBHS	IBHS
8	Luwara	Shetrunji	Gujarat	7897	3976	3420	8576	1575	2382	D	NoHS	IBHS
9	T. Ramapuram	Hagari	Karnataka	1862	-	-	2590	-	-	NHS	NoHS	NoHS
10	Thevur	Sarabenga	Tamil Nadu	-	2346	-	2457	1813	-	*	NoHS	NoHS
11	Varanavasi	Marudaiyar	Tamil Nadu	-	-	2012	-	*	2586	NoHS	*	NHS
12	Vautha	Sabarmati	Gujarat	2153	-	-	2415	-	-	NHS	NoHS	NoHS

(-) means No Hotspot.

(*) means Data not available/ river dry.

No Hot Spot (NoHS) | Deteriorate (D) | New Hotspot (NHS) | Improved but Hotspot (IBHS)

8.3 Ammonia (NH_3-N)

The comparison of hotspots at various monitoring stations along rivers during the years 2023 and 2024 reveals significant changes in water quality and environmental conditions. In 2023, 42 water quality monitoring stations along 20 rivers were identified as hotspots during the pre-monsoon, monsoon, and post-monsoon periods, while in 2024, 47 water quality monitoring stations along the 22 rivers were observed as hotspots.

22 water quality monitoring stations were identified as common hotspots in the years 2023 and 2024. These monitoring stations are located on 11 rivers, namely Ponnaiyar, Kanhan, Bhima, Brahmani, Dhadhar, Hindon, Hindon Cut, Sina, Sabarmati, Wardha and Yamuna. They consistently showed elevated ammonia levels beyond the acceptable limit of 1.2 mg/L. The primary contributors to this issue were identified as industrial discharges, agricultural runoff and urban wastewater. Untreated or inadequately treated effluents released from industrial activities, along with urban areas contributing to increased ammonia levels, were found to be significant factors impacting the water quality of these rivers.

Several monitoring stations showed improvement while some demostrated detoriation in water quality from 2023 to 2024. For instance, 9 monitoring stations on 9 rivers experienced tremendous improvement to No-Hotspots in 2024 as compared to 2023 such as Mawi (Yamuna River) throughout all seasons. 5 monitoring stations on 2 rivers like Galeta (Hindon River) demonstrated improvement but Hotspot throughout all seasons. Conversely, 4 monitoring stations on 3 rivers like Singasadanapalli (Ponnaiyar River) experienced deterioration in water quality in all seasons. No monitoring station emerged as New Hotspots in all seasons.

During pre-monsoon, 16 monitoring stations on 10 rivers like Baghpat (Yamuna River) demonstrated No-Hotspots in 2024 as compared to 2023. 15 monitoring stations on 5 rivers like Lakshmanapatti (Kodaganar River) showed improvement but Hotspot. 10 monitoring stations on 7 rivers like Baleni (Yamuna River) deteriorated in water quality due to potential anthropogenic influences exacerbating water pollution while 5 monitoring stations on 4 rivers like Lucknow (Gomti River) emerged as New Hotspots.

During monsoon, 25 monitoring stations on 18 rivers like Kasganj (Kali River) demonstrated No-Hotspots in 2024 as compared to 2023. 11 monitoring stations on 6 rivers like Poiyaghat (Yamuna River) showed improvement but Hotspot. 13 monitoring stations on 8 rivers like Vautha (Sabarmati River) showed deterioration while 5 monitoring stations on 4 rivers like Pingalwada (Dhadhar River) emerged as New Hotspots.

During post-monsoon, 19 monitoring stations on 13 rivers like Hathikhana (Ganga River) demonstrated No-Hotspots in 2024 as compared to 2023. 11 monitoring stations on 5 rivers like Galeta (Hindon River) showed improvement but Hotspot. 10 monitoring stations on 6 rivers like Singasadanapalli (Ponnaiyar River) deteriorated in water quality while 5

monitoring stations on 2 rivers like Gomlai (Brahmani River) emerged as New Hotspot.

Table 21: Comparison of Ammonia (NH_3-N) Hot Spots during year 2023 with 2024

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)		Pre-M (2024)	M(2024)	Post-M(2024)	Comparision of Hotspots during year 2023 with 2024		
											Pre-M	M	Post- M
1	Adityapur	Kharkai	Jharkhand	-	1.40	-		-	0.57	-	NoHS	NoHS	NoHS
2	Auraiya	Yamuna	Uttar Pradesh	1.69	-	-		1.46	-	-	IBHS	NoHS	NoHS
3	B.P.M. (Bamni)	Wardha	Maharashtra	3.56	2.34	7.73		8.38	2.77	4.39	D	D	IBHS
4	Baghpat	Yamuna	Uttar Pradesh	-	-	0.82		-	-	2.50	NoHS	NoHS	NHS
5	Baleni	Yamuna	Uttar Pradesh	2.92	1.63	3.70		4.35	1.31	0.86	D	IBHS	NoHS
6	Basoda	Betwa	Madhya Pradesh	-	-	*		-	-	1.34	NoHS	NoHS	*
7	Bokaro (Down)	Garga	Jharkhand	*	*	*		11.31	4.15	2.28	*	*	*
8	Bokaro (Up)	Garga	Jharkhand	*	*	*		11.21	4.18	2.28	*	*	*
9	Chilla Gaon	Hindon Cut	Delhi	12.37	3.19	5.05		8.30	7.19	7.29	IBHS	D	D
10	Daund	Bhima	Maharashtra	*	1.81	*		*	0.44	*	*	NoHS	*
11	Delhi Railway Bridge	Yamuna	Delhi	18.44	7.16	10.20		15.56	7.24	10.62	IBHS	D	D
12	Dhansa	Sahibi	Delhi	*	3.72	*		*	0.61	*	*	NoHS	*
13	Dudhnoi	Dudhnai	Assam	-	0.11	-		-	1.44	-	NoHS	NHS	NoHS
14	Etawah	Yamuna	Uttar Pradesh	10.02	0.92	3.98		6.34	1.62	3.80	IBHS	NHS	IBHS
15	Gaisabad	Bearma	Madhya Pradesh	2.09	-	-		*	-	-	*	NoHS	NoHS
16	Galeta	Hindon	Uttar Pradesh	12.35	5.03	4.13		6.69	2.09	3.11	IBHS	IBHS	IBHS
17	Gatora-2	Arpa	Chhattisgarh	1.51	1.28	-		0.95	0.17	-	NoHS	NoHS	NoHS
18	Gokul Barrage II Mathura D/S	Yamuna	Uttar Pradesh	10.84	4.51	10.48		15.17	5.51	11.38	D	D	D
19	Gomlai	Brahmani	Odisha	3.69	-	0.58		0.99	-	1.62	NoHS	NoHS	NHS
20	Gomti Nagar	Gomti	Uttar Pradesh	1.16	-	-		1.48	-	-	NHS	NoHS	NoHS
21	Gummanur	Ponnaiyar	Tamil Nadu	5.60	3.63	3.75		4.64	1.86	3.06	IBHS	IBHS	D
22	Hathikhana	Ganga	Uttar Pradesh	0.17	-	-		1.33	-	-	NHS	NoHS	NoHS
23	Jawahar Bridge, Agra	Yamuna	Uttar Pradesh	15.26	4.74	10.15		11.71	4.13	7.61	IBHS	IBHS	IBHS
24	K.T.(Satrapur)	Kanhan	Maharashtra	2.33	3.37	33.53		36.83	18.90	25.02	D	D	IBHS
25	Kailash Mandir, Near Benpur Village	Yamuna	Uttar Pradesh	15.49	5.09	11.87		11.84	3.14	8.19	IBHS	IBHS	IBHS
26	Kalampur	Kaliyar	Kerala	-	-	0.03		-	-	5.03	NoHS	NoHS	NoHS
27	Kalindi Kunj	Agra Canal	Delhi	10.55	3.25	6.75		14.80	7.33	8.75	D	D	D
28	Kalpi	Yamuna	Uttar Pradesh	-	0.37	-		-	1.31	-	NoHS	NHS	NoHS
29	Kamalanga	Brahmani	Odisha	2.18	-	-		0.52	-	-	NoHS	NoHS	NoHS
30	Kasganj	Kali	Uttar Pradesh	0.51	-	-		1.90	-	-	NHS	NoHS	NoHS
31	Kulpatanga	Kharkai	Jharkhand	-	1.63	-		-	0.62	-	NoHS	NoHS	NoHS
32	Lakshmanapatti	Kodaganar	Tamil Nadu	-	1.48	-		-	0.89	-	NoHS	NoHS	NoHS
33	Lucknow	Gomti	Uttar Pradesh	0.78	-	-		1.40	-	-	NHS	NoHS	NoHS
34	Mawi	Yamuna	Uttar Pradesh	-	-	0.65		-	-	1.30	NoHS	NoHS	NoHS
35	Mohna	Yamuna	Haryana	19.19	6.44	8.33		15.49	7.87	10.76	IBHS	D	D
36	Motinaroli	Kim	Gujarat	-	-	*		-	-	1.74	NoHS	NoHS	*
37	Nandira	Brahmani	Odisha	2.39	-	-		0.46	-	-	NoHS	NoHS	NoHS
38	Noida	Yamuna	Uttar Pradesh	21.28	9.17	10.20		14.42	7.49	4.25	IBHS	D	IBHS
39	Okhla Barrage	Yamuna	Delhi	13.40	4.47	6.36		13.80	8.49	8.84	D	D	D
40	Palla	Yamuna	Delhi	2.17	-	0.63		0.86	-	2.56	NoHS	NoHS	NHS
41	Panposh-2	Koel	Odisha	-	5.84	-		-	0.53	-	NoHS	NoHS	NoHS
42	Pargaon	Bhima	Maharashtra	*	2.91	*		*	1.94	*	*	IBHS	*
43	Pingalwada	Dhadhar	Gujarat	4.06	0.74	*		4.62	2.50	2.54	D	NHS	*
44	Poiyaghat, Agra	Yamuna	Uttar Pradesh	14.98	4.65	10.73		11.03	2.95	6.60	IBHS	IBHS	IBHS
45	Pupunki	Damodar	Jharkhand	*	*	*		*	0.45	1.95	*	*	*
46	R.S.P	Brahmani	Odisha	17.02	14.62	1.40		9.69	5.06	12.06	IBHS	IBHS	D
47	R.S.P-1	Brahmani	Odisha	10.92	9.52	0.76		4.08	6.01	5.14	IBHS	IBHS	NHS
48	R.S.P-2	Brahmani	Odisha	2.79	3.58	1.15		2.14	5.45	2.06	IBHS	D	NHS
49	Rahu (Mirawadi)	Mula Mutha	Maharashtra	*	3.37	*		*	3.19	*	*	IBHS	*
51	Singasadanapalli	Ponnaiyar	Tamil Nadu	24.47	24.81	25.67		25.48	32.41	28.98	D	D	D
52	Sonamura	Gumti	Tripura	0.06	-	-		2.59	-	-	NHS	NoHS	NoHS
52	T Bekuppe	Arkavathy	Karnataka	*	*	*		*	16.46	12.86	*	*	*
53	Ujjain	Shipra	Madhya Pradesh	*	0.05	1.87		*	3.58	4.96	*	NHS	D
54	Vautha	Sabarmati	Gujarat	3.27	4.23	5.12		4.94	5.14	4.85	D	D	IBHS
55	Vrindawan Bridge (Mathura U/S)	Yamuna	Uttar Pradesh	15.49	4.69	11.46		15.83	5.61	11.15	D	D	IBHS
56	Wadakbal	Sina	Maharashtra	*	3.85	*		*	0.63	1.36	*	NoHS	*
57	Watrak Nr Vautha	Watrak	Gujarat	4.35	-	-		*	-	*	*	NoHS	*

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)		Pre-M (2024)	M(2024)	Post-M(2024)	Comparision of Hotspots during year 2023 with 2024		
											Pre-M	M	Post- M
58	Yamuna Expessway Road Bridge, Etamadpur	Yamuna	Uttar Pradesh	17.51	5.21	11.03		13.19	4.77	6.24	IBHS	IBHS	IBHS

(-) means No Hotspot
(*) means Data not available/ river dry.

No Hot Spot (NoHS) | Deteriorate (D) | New Hotspot (NHS) | Improved but Hotspot (IBHS)

8.4 Total Hardness (TH)

The comparison of hotspots at various monitoring stations along rivers during the years 2023 and 2024 reveals significant changes in river water quality. In 2023, three (03) water quality monitoring stations, namely B.P.M. (Bamni) on the Wardha River, Lakshmanapatti on the Kodaganar River and Luwara on the Shetrunji River, showed total hardness values above the permissible limit of BIS 10500:2012 for the pre-monsoon, monsoon and post-monsoon seasons. Similarly, in 2024, four (04) stations, specifically B.P.M. (Bamni) on the Wardha River, Dhansa on Sahibi River, Lakshmanapatti on the Kodaganar River and Luwara on the Shetrunji River, recorded total hardness levels above the permissible were observed as hotspots.

Three (03) water quality monitoring stations were commonly identified in both 2023 and 2024: B.P.M. (Bamni) (Wardha River) in Maharashtra, Lakshmanapatti on the Kodaganar River Tamil nadu and Luwara (Shetrunji River) in Gujarat.

Several monitoring stations showed improvement while some demostrated detoriation in water quality from 2023 to 2024. For instance, 1 monitoring station Lakshmanapatti (Kodaganar River) demonstrated improvement but Hotspot throughout all seasons.

During pre-monsoon, 3 monitoring stations on 3 rivers like Luwara (Shetrunji River) showed improvement but Hotspot.

During monsoon, 1 monitoring station Luwara (Shetrunji River) demonstrated No-Hotspots in 2024 as compared to 2023. 1 monitoring station Lakshmanapatti (Kodaganar River) showed improvement but Hotspot. 2 monitoring stations on 2 rivers like Dhansa (Sahibi River) showed deterioration in water quality.

During post-monsoon, 1 monitoring station Luwara (Shetrunji River) demonstrated No-Hotspots in 2024 as compared to 2023. 2 monitoring stations on 2 rivers like B.P.M.(Bamni) (Wardha River) showed improvement but Hotspot.

Table 22 Comparison of Hot Spots Total Hardness (TH) during year 2023 with 2024

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M(2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
1	B.P.M. (Bamni)	Wardha	Maharashtra	675	518	629	636	648	532	IBHS	D	IBHS
2	Dhansa	Sahibi	Haryana	*	462.1	*	*	626	*	*	D	*
3	Lakshmanapatti	Kodaganar	Tamil Nadu	717	961	910	510	604	575	IBHS	IBHS	IBHS
4	Luwara	Shetrunji	Gujarat	1046	-	-	839	-	-	IBHS	NoHS	NoHS

(-) means No Hotspot; (*) means Data not available/ river dry.

No Hot Spot (NoHS) | Deteriorate (D) | New Hotspot (NHS) | Improved but Hotspot (IBHS)

8.5 Chloride (Cl^-)

During 2023, three (03) water quality stations - Durvesh (Vaitarna river), Lakshmanapatti (Kodaganar river) and Luwara (Shetrunji river) - exceeded the permissible limit of 1000 mg/L for chloride. Luwara (Shetrunji River) in Gujarat was the only station identified as a hotspot in 2024 and it is commonly identified in both 2023 and 2024.

Most of the monitoring stations showed improvement while one station demonstrated detoriation in water quality from 2023 to 2024. For instance, 1 monitoring station Lakshmanapatti (Kodaganar River) demonstrated No Hotspot throughout all seasons.

During pre-monsoon, 2 monitoring stations on 2 rivers like Durvesh (Vaitarna River) demonstrated No-Hotspots in 2024 as compared to 2023. 1 monitoring station Luwara (Shetrunji River) showed deterioration in water quality.

During monsoon, 3 monitoring stations on 3 rivers like Lakshmanapatti (Kodaganar River) demonstrated No-Hotspots in 2024 as compared to 2023.

During post-monsoon, 2 monitoring stations on 2 rivers like Luwara (Shetrunji River) demonstrated No-Hotspots in 2024 as compared to 2023.

High chloride levels often indicate the presence of industrial effluents, agricultural runoff, or urban waste, which pose risks to aquatic ecosystems and public health.

The water quality with respect to chloride in 2024 improved in study area as compared to 2023.

Table 23: Comparison of Chloride (Cl^-) Hot Spots during year 2023 with 2024

S. No.	Water Quality Monitoring Station	River	State	Pre-M(2023)	M(2023)	Post-M(2023)	Pre-M(2024)	M(2024)	Post-M(2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
1	Durvesh	Vaitarna	Maharashtra	1374.24	-	*	55.6	-	-	NoHS	NoHS	*
2	Lakshmanapatti	Kodaganar	Tamil Nadu	-	1368.25	1429.17	-	845.9	833.3	NoHS	NoHS	NoHS
3	Luwara	Shetrunji	Gujarat	2305.56	1396.76	-	2613.3	340.2	-	D	NoHS	NoHS

(-) means No Hotspot.

No Hot Spot (NoHS) | Deteriorate (D) | New Hotspot (NHS) | Improved but Hotspot (IBHS)

8.6 Fluoride (F^-)

During 2023, six (06) monitoring stations namely Kamalapuram (Papagani), Lakshmanapatti (Kodaganar), Lingdem (HS) (Talangchu), R.S.P (Brahmani), R.S.P-1 (Brahmani) and Tadipatri (Pennar) surpassed the acceptable limits for fluoride concentrations. But, in 2024, only one (01) water quality monitoring at Lingdem Hot Spring (Talang Chu River) station recorded fluoride levels above the permissible thresholds.

In both 2023 and 2024, one water quality monitoring station was commonly identified: at Lingdem Hot Spring (Talang Chu River). The presence of fluoride in this location, Talang Chu (hot spring), is likely due to the leaching of fluoride-bearing minerals from rocks.

All monitoring stations showed improvement in water quality from 2023 to 2024. For instance, 3 monitoring stations on 3 rivers like Lakshmanapatti (Kodaganar River) demonstrated No Hotspot throughout all seasons.

During pre-monsoon, 3 monitoring stations on 2 rivers like R.S.P. (Brahmani River) demonstrated No-Hotspots in 2024 as compared to 2023. 1 monitoring station Lingdem Hot Spring (Talang Chu River) showed improvement but Hotspot.

During monsoon, 5 monitoring stations on 4 rivers like Tadipatri (Pennar River) demonstrated No-Hotspots in 2024 as compared to 2023. 1 monitoring station Lingdem Hot Spring (Talang Chu River) showed improvement but Hotspot.

During post-monsoon, 3 monitoring stations on 2 rivers like R.S.P. (Brahmani River) demonstrated No-Hotspots in 2024 as compared to 2023.

Table 24: Comparison of Fluoride (F^-) Hot Spots during year 2023 with 2024

S.No.	Water Quality Monitoring Station	River	State	Pre-M(2023)	M(2023)	Post-M(2023)	Pre-M(2024)	M(2024)	Post-M(2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
1	Kamalapuram	Papagani	Andhra Pradesh	1.80	-	*	*	-	*	*	NoHS	*
2	Lakshmanapatti	Kodaganar	Tamil Nadu	-	-	1.60	-	-	0.67	NoHS	NoHS	NoHS
3	Lingdem Hot Spring	Talang Chu	Sikkim	7.57	6.31	7.30	5.17	5.01	*	IBHS	IBHS	*
4	R.S.P	Brahmani	Odisha	1.67	-	-	0.85	-	-	NoHS	NoHS	NoHS
5	R.S.P-1	Brahmani	Odisha	1.86	-	-	0.67	-	-	NoHS	NoHS	NoHS
6	Tadipatri	Pennar	Andhra Pradesh	1.72	-	*	*	-	*	*	NoHS	*

(-) means No Hotspot
(*) means Data not available/ river dry.

No Hot Spot (NoHS) | Deteriorate (D) | New Hotspot (NHS) | Improved but Hotspot (IBHS)

8.7 Nitrate as N (NO_3^--N):

The comparison of hotspots at various monitoring stations along rivers during the years 2023 and 2024 reveals significant changes in water quality and environmental conditions. A total of Forty-two (42) water quality stations at 27 rivers exceeded the nitrate concentration in 2023. These rivers included Ajoy, Arkavathy, Badanadi, Bhagirathi, Bhima, Brahmani, Churni/Bhagirathi, Edduvagu, Feeder Canal, Ganga, Garga, Gomti, Hoogly/Bhagirathi, Jalangi/Bhagirathi, Kharkai, Krishna, Mathabhanga/Bhagirathi, Munneru, Musi, Ponnaiyar, Purna, Ramganga, Rushikulya, Sarada, Subarnarekha, Sukheta, and Wyra.

In 2024, twenty-two (22) water quality stations at 22 rivers Hemavathi, Suvarnavathi, Malaprabha, Ghataprabha, Ponnaiyar, Tungabhadra, Cauvery/ Lakshmanthirth, Vedavathi, Arkavathi, Cauvery, Kumudvathi, Wyra, Bhima, Varada, Edduvagu, Purna, Arkavathy, Shimsha, Kabini, Musi and Krishna exceeded the nitrate concentration.

Six (06) water quality stations, namely Gummanur, Koggedoddi, Madhira, Munugodu, Purna and T Bekuppe, located along six (06) rivers (Ponnaiyar, Arkavathi, Wyra, Edduvagu, Purna and Arkavathy) were identified as common hotspot stations between 2023 and 2024.

Most of the monitoring stations showed improvement while a few stations demonstrated detoriation in water quality from 2023 to 2024. For instance, 17 monitoring stations on 9 rivers experienced tremendous improvement to

No-Hotspots in 2024 as compared to 2023 such as Gomti Nagar (Lko D/S) (Gomti river) during all seasons.

During pre-monsoon season, 18 monitoring stations on 10 rivers like Kaziupura (Ramganga river) demonstrated No-Hotspots in 2024 as compared to 2023. 1 monitoring station Gummanur (Ponnaiyar River) deteriorated in water quality indicating persistent environmental challenges and potential anthropogenic influences while 4 monitoring stations on 4 rivers like Vijayawada (Krishna River) emerged as New Hotspots.

During monsoon season, 50 monitoring stations on 34 rivers like Adityapur (Kharkai River) showed No-Hotspots in 2024 as compared to 2023. 1 monitoring stations Valigonda (Musi River) showed signs of improvement but still a Hotspot. 1 monitoring station Gummanur (Ponnaiyar River) deteriorated in water quality while 3 monitoring stations on 2 rivers like T. Bekuppe (Arkavathy River) emerged as New Hotspots.

During post-monsoon season, 38 monitoring stations on 23 rivers like Tondarpur (Sukheta River) showed No-Hotspots in 2024 as compared to 2023. 3 monitoring stations on 2 rivers like Koggedodi (Arkavathy River) deteriorated in water quality while 10 monitoring stations on 10 rivers like Gummanur (Ponnaiyar River) emerged as New Hotspots.

Table 25: Comparison of Hot Spots Nitrate as N (NO_3^--N) during year 2023 with 2024

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
1	Adityapur	Kharkai	Jharkhand	-	12.81	-	-	5.99	-	NoHS	NoHS	NoHS
2	Akkihebbal	Hemavathi	Karnataka	-	-	1.65	*	-	10.60	*	NoHS	NHS
3	Anakapali	Sarada	Andhra Pradesh	-	11.32	-	-	7.19	-	NoHS	NoHS	NoHS
4	Bagh Bazar Ghat	Hoogly/ Bhagirathi	West Bengal	*	12.53	13.03	-	2.64	2.86	*	NoHS	NoHS
5	Banpur	Mathabhanga/ Bhagirathi	West Bengal	*	18.87	-	-	2.54	-	*	NoHS	NoHS
6	Baridhi	Subarnarekha	Jharkhand	-	10.49	-	-	5.93	-	NoHS	NoHS	NoHS
7	Bendrahalli	Suvarnavathi	Karnataka	-	-	9.92	*	-	18.28	*	NoHS	NHS
8	Berhampore	Bhagirathi	West Bengal	*	13.60	-	-	2.57	-	*	NoHS	NoHS
9	Bokaro Down	Garga	Jharkhand	*	15.10	-	-	2.56	-	*	NoHS	NoHS
10	Bokaro Up	Garga	Jharkhand	*	14.25	-	-	2.69	-	*	NoHS	NoHS
11	Bonaigarh	Brahmani	Odisha	-	22.19	-	-	6.29	-	NoHS	NoHS	NoHS
12	Byaladahalli	HARIDRA	Karnataka	*	-	6.06	*	-	10.55	*	NoHS	NHS
13	Chapra	Jalangi/ Bhagirathi	West Bengal	*	15.41	17.44	-	1.92	2.12	*	NoHS	NoHS
14	Cholachagudda	Malaprabha	Karnataka	-	8.46	*	*	26.03	28.17	*	NHS	*
15	Deongaon Bridge	Bhima	Karnataka	-	12.54	*	*	3.41	-	*	NoHS	*
16	Domuhani	Subarnarekha	Jharkhand	-	12.27	-	-	5.73	-	NoHS	NoHS	NoHS
17	Farakka Cs 97 A	Ganga	West Bengal	*	12.57	-	-	2.52	-	*	NoHS	NoHS
18	GH.Rd.Bridge	Subarnarekha	Jharkhand	-	12.79	-	-	5.86	-	NoHS	NoHS	NoHS

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
19	Ghatshila	Subarnarekha	Jharkhand	-	10.36	-	-	5.78	-	NoHS	NoHS	NoHS
20	Gokak	Ghataprabha	Karnataka	*	-	0.70	*	-	22.97	*	NoHS	NHS
21	Gomti Nagar (Lko D/S)	Gomti	Uttar Pradesh	-	11.90	-	-	9.13	-	NoHS	NoHS	NoHS
22	Gummanur	Ponnaiyar	Tamil Nadu	10.79	11.14	11.32	14.13	12.62	12.54	D	D	NHS
23	H R Farakka	Feeder Canal	West Bengal	*	12.99	-	-	2.53	-	*	NoHS	NoHS
24	Hanskhali	Churni/ Bhagirathi	West Bengal	*	18.25	23.04	-	2.45	2.83	*	NoHS	NoHS
25	Haralahalli	Tungabhadra	Karnataka	-	-	3.91	*	-	14.63	*	NoHS	NHS
26	Huvinhedgi	Krishna	Karnataka	-	-	10.89	-	-	3.07	NoHS	NoHS	NoHS
27	Jamshedpur	Subarnarekha	Jharkhand	-	10.43	-	-	4.82	-	NoHS	NoHS	NoHS
28	Jamtara	Ajoy	Jharkhand	*	10.30	-	-	1.80	-	*	NoHS	NoHS
29	K M Vadi	Cauvery/ Lakshmanthirth	Karnataka	*	-	5.67	*	-	13.15	*	NoHS	NHS
30	Kalna Ebb	Bhagirathi	West Bengal	*	11.12	13.15	-	2.18	2.48	*	NoHS	NoHS
31	Kalna Flow	Bhagirathi	West Bengal	*	11.33	16.78	-	2.09	2.24	*	NoHS	NoHS
32	Katwa	Bhagirathi	West Bengal	*	13.31	15.41	-	2.33	2.58	*	NoHS	NoHS
33	Kaziupura	Ramganga	Uttar Pradesh	-	10.73	10.18	-	4.76	8.15	NoHS	NoHS	NoHS
34	Keesara	Munneru	Andhra Pradesh	-	-	10.53	*	-	2.46	*	NoHS	NoHS
35	Kellodu	Vedavathi	Karnataka	*	*	*	*	-	16.47	*	*	*
36	Koggedoddi	Arkavathy	Karnataka	-	7.64	13.46	*	38.20	38.53	*	NHS	D
37	Kollegala	Cauvery	Karnataka	2.63	-	2.85	*	-	12.00	*	NoHS	NHS
38	Kuppellur	Kumudvathi	Karnataka	*	-	*	*	-	18.58	*	NoHS	*
39	Lupungdih	Subarnarekha	Jharkhand	-	10.88	-	-	5.83	-	NoHS	NoHS	NoHS
40	Madhabarida	Badanadi	Odisha	-	11.14	-	-	*	*	NoHS	*	*
41	Madhira	Wyra	Telangana	3.35	-	10.26	10.57	-	3.37	NHS	NoHS	NoHS
42	Malkhed	Bhima	Karnataka	3.81	-	-	10.19	-	-	NHS	NoHS	NoHS
43	Marol	Varada	Karnataka	*	-	*	*	-	19.17	*	NoHS	*
44	Munugodu	Edduvagu	Andhra Pradesh	3.95	13.15	12.20	12.45	3.29	3.66	NHS	NoHS	NoHS
45	Nutanhat	Ajoy	West Bengal	*	11.61	-	-	2.46	-	*	NoHS	NoHS
46	Panihati Ferry Ghat	Hoogly/ Bhagirathi	West Bengal	*	13.15	12.58	-	2.55	2.91	*	NoHS	NoHS
47	Purna	Purna	Maharashtra	*	-	10.70	10.48	4.71	3.09	*	NoHS	NoHS
48	R.S.P	Brahmani	Odisha	-	12.21	-	-	6.59	-	NoHS	NoHS	NoHS
49	R.S.P-1	Brahmani	Odisha	-	10.39	-	-	7.58	-	NoHS	NoHS	NoHS
50	Sorada	Rushikulya	Odisha	-	11.67	-	-	5.25	-	NoHS	NoHS	NoHS
51	T Bekuppe	Arkavathy	Karnataka	-	8.54	15.14	*	18.88	23.53	*	NHS	D
52	T K Halli	Shimsha	Karnataka	-	-	4.89	*	-	11.42	*	NoHS	NHS
53	T Narsipura	Kabini	Karnataka	-	-	3.41	*	-	14.73	*	NoHS	NHS
54	Tihar Khera	Ramganga	Uttar Pradesh	-	10.59	-	-	5.84	-	NoHS	NoHS	NoHS
55	Tondarpur	Sukheta	Uttar Pradesh	-	-	12.98	-	-	8.88	NoHS	NoHS	NoHS
56	Valigonda	Musi	Telangana	-	17.43	20.26	*	13.01	24.26	*	IBHS	D
57	Vijayawada	Krishna	Andhra Pradesh	1.72	-	-	10.35	-	-	NHS	NoHS	NoHS

(-) means No Hotspot

(*) means Data not available/ river dry.

No Hot Spot (NoHS) | Deteriorate (D) | New Hotspot (NHS) | Improved but Hotspot (IBHS)

8.8 Dissolved Oxygen (DO):

During 2024, in the pre-monsoon season, 98 water quality monitoring stations on 86 rivers in 18 states Madhya Pradesh, Jharkhand, Andhra Pradesh, Odisha, Tamil Nadu, Uttar Pradesh, Maharashtra, Bihar, Karnataka, Delhi, Rajasthan, Haryana, Telangana, Chhattisgarh, West Bengal, Puducherry, Gujarat, Uttarakhand recorded average DO values below 5.0 mg/l as compared to 2023 pre-monsoon where 86 Water Quality monitoring stations on 42 rivers in 14 states Jharkhand, Odisha, Maharashtra, Uttar Pradesh, West Bengal, Delhi, Telangana, Chhattisgarh, Tamil Nadu, Haryana, Andhra Pradesh, Gujarat, Uttarakhand and Karnataka.

In the monsoon season 102 water quality stations across 15 states Madhya Pradesh, Andhra Pradesh, Tamil Nadu, Uttar Pradesh, Maharashtra, Odisha, Delhi, Rajasthan, Haryana, Telangana, West Bengal, Jharkhand, Gujarat, Uttarakhand and Karnataka reporting average DO values below 5.0 mg/l during 2024 as compared to 2023 where 99 water quality stations on 53 Rivers across 14 states Madhya Pradesh, Jharkhand, Odisha, Maharashtra, Uttar Pradesh, Delhi, Telangana, Chhattisgarh, Tamil Nadu, Andhra Pradesh, Haryana, Gujarat, Uttarakhand and Karnataka.

Finally, in the post-monsoon season, 57 water quality monitoring stations on 40 rivers across 14 states Tamil Nadu, Maharashtra, Bihar, Uttar Pradesh, Delhi, Telangana, Karnataka, Haryana, Puducherry, Andhra Pradesh, Gujarat, Odisha and Uttarakhand recorded average DO values below 5.0 mg/l during 2024 as compared to 2023 where 62 water quality monitoring stations on 35 rivers across 14 states Jharkhand, Odisha, Maharashtra, Uttar Pradesh, Delhi, Telangana, Tamil Nadu, Assam, Haryana, Andhra Pradesh, Uttarakhand, Karnataka, Madhya Pradesh and Gujarat.

Several monitoring stations showed improvement as well as detoriation in water quality from 2023 to 2024. For instance, 13 monitoring stations on 10 rivers experienced tremendous improvement to No-Hotspots in 2024 as compared to 2023 such as Bagpat (Yamuna River) during all seasons. 2 monitoring stations on 2 rivers like B.P.M.(Bamni) (Wardha River) demonstrated improvement but Hotspot throughout all seasons. Conversely, 9 monitoring stations on 6 rivers like Baleni (Yamuna River) experienced deterioration in water quality in all seasons. No monitoring station emerged as New Hotspots in all seasons.

During pre-monsoon season, 53 monitoring stations on 39 rivers like Bhind (Kunwari river) demonstrated No-Hotspots in 2024 as compared to 2023. 29 monitoring stations on 17 rivers like Lucknow (Gomti River) showed signs of improvement but still Hotspot. 48 monitoring stations on 25 rivers like Vautha (Sabarmati River) deteriorated in water quality indicating persistent environmental challenges and potential anthropogenic influences exacerbating water pollution while 19 monitoring stations on 18 rivers like Bhitaura (Ganga River) emerged as New Hotspots.

During monsoon season, 66 monitoring stations on 36 rivers like Baghpat (Yamuna River) showed No-Hotspots in 2024 as compared to 2023. 24 monitoring stations on 16 rivers like Bareilly (Ramganga River) showed signs of improvement but still a Hotspot. 45 monitoring stations on 31 rivers like Gummanur (Ponnaiyar River) deteriorated in water quality while 29 monitoring stations on 24 rivers like Nasik (Godavari River) emerged as New Hotspots.

During post-monsoon season, 103 monitoring stations on 55 rivers like Basti (Kwano River) showed No-Hotspots in 2024 as compared to 2023. 16 monitoring stations on 13 rivers like Vautha (Sabarmati River) showed signs of improvement but still Hotspot. 24 monitoring stations on 15 rivers like Galeta (Hindon River) deteriorated in water quality while 10 monitoring stations on 9 rivers like Kannauj (Kali River) emerged as New Hotspots.

Overall, this comparative analysis highlights the fact that although there is an increase in the number of water quality monitoring stations reporting low DO levels during all seasons of 2024, the situation appears to be deteriorating the water quality of rivers throughout the year.

Table 26: Comparison of Hot Spots Dissolved Oxygen (DO) during year 2023 with 2024

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post-M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
1	A.B. Road Crossing	Parwati	Madhya Pradesh	*	4.33	*	*	4.28	*	*	D	*
2	Adityapur	Kharkai	Jharkhand	4.03	4.20	4.93	4.24	5.02	5.27	D	NoHS	NoHS
3	Alladupalli	Pennar/ Kunderu	Andhra Pradesh	-	5.40	-	-	4.95	-	NoHS	NHS	NoHS
4	Altuma	Ramial	Odisha	4.51	4.48	-	4.77	5.25	-	D	NoHS	NoHS
5	Anakapali	Sarada	Andhra Pradesh	4.98	4.83	4.90	4.46	5.02	6.40	D	NoHS	NoHS
6	Anandapur	Baitarani	Odisha	4.46	4.80	4.57	4.83	5.32	6.92	IBHS	NoHS	NoHS
7	AP Puram	Chittar	Tamil Nadu	*	*	-	2.57	*	-	*	*	NoHS
8	Aradei	Aradei	Odisha	5.06	4.94	-	4.25	5.51	-	D	NoHS	NoHS
9	Arcot	Palar	Tamil Nadu	-	5.49	5.51	-	3.89	4.60	NoHS	NHS	NHS
10	Auraiya	Yamuna	Uttar Pradesh	-	5.87	4.87	-	4.24	7.56	NoHS	NHS	NoHS
11	B.P.M. (Bamni)	Wardha	Maharashtra	2.64	3.12	3.93	3.00	3.57	4.43	IBHS	IBHS	IBHS
12	Bachhwara	Baya	Bihar	*	*	*	*	5.30	4.84	*	*	*
13	Badlapur	Ulhas	Maharashtra	-	-	4.92	-	-	4.97	NoHS	NoHS	IBHS
14	Baghpat	Yamuna	Uttar Pradesh	4.33	4.63	-	5.2	5.7	-	NoHS	NoHS	NoHS
15	Baleni	Yamuna	Uttar Pradesh	0.43	3.14	1.48	0.78	1.16	1.00	D	D	D
16	Balighat	Burhabalang	Odisha	4.74	4.72	-	4.51	5.04	-	D	NoHS	NoHS
17	Banpur	Mathabhanga/ Bhagirathi	West Bengal	1.76	*	*	*	*	*	*	*	*
18	Bareilly	Ramganga	Uttar Pradesh	4.87	4.18	-	6.38	4.73	-	NoHS	IBHS	NoHS
19	Baridhi	Subarnarekha	Jharkhand	4.48	4.92	4.79	5.1	5.2	6.3	NoHS	NoHS	NoHS

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post-M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
20	Baripada	Burhabalang	Odisha	4.83	4.90	4.86	4.58	4.77	5.98	D	D	NoHS
21	Basti	Kwano	Uttar Pradesh	5.35	4.00	-	4.12	3.10	-	D	D	NoHS
22	Basti D/S	Kwano	Uttar Pradesh	4.47	4.41	-	4.47	2.76	-	D	D	NoHS
23	Basti U/S	Kwano	Uttar Pradesh	-	5.38	-	-	4.30	-	NoHS	NHS	NoHS
24	Bawapuram	Tungabhadra	Andhra Pradesh	6.26	-	-	2.93	-	-	NHS	NoHS	NoHS
25	Bendrahalli	Suvarnavathi	Karnataka	4.99	4.92	-	4.87	5.31	-	D	NoHS	NoHS
26	Bhind	Kunwari	Madhya Pradesh	-	6.10	-	-	4.41	-	NoHS	NHS	NoHS
27	Bhitaura	Ganga	Uttar Pradesh	5.37	3.99	-	3.82	5.03	-	NHS	NoHS	NoHS
28	Bido	Brahmani	Odisha	4.93	4.23	4.62	4.23	5.32	5.50	D	NoHS	NoHS
29	Bolani	Brahmani	Odisha	4.81	4.74	4.87	4.36	4.82	5.29	D	IBHS	NoHS
30	Bonaigarh	Brahamani	Odisha	5.06	4.93	4.65	4.16	5.21	6.07	NHS	NoHS	NoHS
31	Champua	Baitarani	Odisha	5.12	-	-	4.55	-	-	NHS	NoHS	NoHS
32	Chandrika Devi	Gomti	Uttar Pradesh	-	6.04	-	-	4.47	-	NoHS	NHS	NoHS
33	Chilla Gaon	Hindon Cut	Delhi	0.98	1.99	1.17	0.33	0.36	0.71	D	D	D
34	Chittorgarh	Gambhiri	Rajasthan	*	*	*	*	3.74	*	*	*	*
35	Dabri	Ramganga	Uttar Pradesh	6.13	3.75	6.40	3.68	3.43	4.96	NHS	D	NHS
36	Dadri	Sahibi	Haryana	*	*	*	*	1.97	*	*	*	*
37	Dameracherla	Musi	Telangana	4.69	4.12	4.61	2.37	4.39	4.91	D	IBHS	IBHS
38	Daund	Bhima	Maharashtra	*	5.24	*	*	4.69	*	*	NHS	*
39	Delhi Railway Bridge	Yamuna	Delhi	0.18	1.19	0.41	0.09	1.44	0.28	D	IBHS	D
40	Deongaon Bridge	Bhima	Karnataka	*	-	*	*	-	4.64	*	NoHS	*
41	Deosugur	Musi	Karnataka	5.02	-	-	4.97	-	-	NHS	NoHS	NoHS
42	Dhaneta	Kitcha/Bahgul	Uttar Pradesh	-	3.29	4.78	-	4.75	3.65	NoHS	IBHS	D
43	Dhansa	Sahibi	Delhi	*	3.07	*	*	3.21	*	*	IBHS	*
44	Domuhani	Subarnarekha	Jharkhand	4.71	4.61	-	4.87	5.33	-	IBHS	NoHS	NoHS
45	Etawah	Yamuna	Uttar Pradesh	4.41	3.65	4.19	4.02	2.71	4.61	D	D	IBHS
46	Fatehgarh	Ganga	Uttar Pradesh	4.61	3.04	-	5.7	5.5	-	NoHS	NoHS	NoHS
47	Galeta	Hindon	Uttar Pradesh	0.04	1.90	0.17	0.70	1.37	0.00	IBHS	D	D
48	Garrauli	Dhasan	Madhya Pradesh	-	6.39	-	-	4.97	-	NoHS	NHS	NoHS
49	Gatora	Arpa	Chhattisgarh	4.62	-	-	5.1	-	-	NoHS	NoHS	NoHS
50	Gatora-1	Arpa	Chhattisgarh	4.62	4.42	-	4.99	5.59	-	IBHS	NoHS	NoHS
51	Gatora-2	Arpa	Chhattisgarh	4.05	2.03	-	4.85	5.46	-	IBHS	NoHS	NoHS
52	GH.Rd. Bridge	Subarnarekha	Jharkhand	4.80	4.88	-	4.99	5.08	-	IBHS	NoHS	NoHS
53	Gokul Barrage II Mathura D/S	Yamuna	Uttar Pradesh	1.87	2.39	1.59	1.98	2.60	1.97	IBHS	IBHS	IBHS
54	Gomlai	Brahmani	Odisha	4.81	4.89	-	4.86	5.45	-	IBHS	NoHS	NoHS
55	Gomti Nagar (Lko D/S)	Gomti	Uttar Pradesh	2.99	2.36	2.55	2.24	1.91	3.34	D	D	IBHS
56	Gopiballavpur	Subarnarekha	West Bengal	4.46	5.02	-	4.42	4.97	-	D	NHS	NoHS
57	Gopurajapuram	Puravidlyanar	Tamil Nadu	-	4.62	5.21	-	3.90	4.50	NoHS	D	NHS
58	Govindpur (NH-5)	Burhabalang	Odisha	4.57	4.75	4.47	4.72	5.48	6.22	IBHS	NoHS	NoHS
59	GR Bridge	Godavari	Maharashtra	-	-	4.49	-	-	6.3	NoHS	NoHS	NoHS
60	Gudari	Vamsadhara	Odisha	4.85	-	4.70	4.42	-	6.27	D	NoHS	NoHS

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post-M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
61	Gummanur	Ponnaiyar	Tamil Nadu	3.36	2.42	2.24	2.96	2.29	3.65	D	D	IBHS
62	Gunupur	Vamsadhara	Odisha	4.86	4.58	4.85	3.95	5.36	5.90	D	NoHS	NoHS
63	Halia	Halia	Telangana	5.60	3.97	*	*	4.45	4.62	*	IBHS	*
64	Hanskhali	Churni/ Bhagirathi	West Bengal	2.36	*	*	*	*	*	*	*	*
65	Hathi Khana	Ganga	Uttar Pradesh	3.95	3.83	5.72	4.84	5.35	4.97	IBHS	NoHS	NHS
66	Hogenakkal	Chinnar	Tamil Nadu	6.27	*	-	*	4.61	-	*	*	NoHS
67	Huvinhedgi	Krishna	Karnataka	5.54	-	-	4.96	-	-	NHS	NoHS	NoHS
68	Indupur	Brahmani	Odisha	4.70	4.65	4.28	3.94	*	*	D	*	*
69	Irrukkankudi	Vaippar	Tamil Nadu	*	1.59	1.86	4.03	*	3.20	*	*	IBHS
70	Jamshedpur	Subarnarekha	Jharkhand	3.88	4.30	-	4.93	4.75	-	IBHS	IBHS	NoHS
71	Jamsolaghat	Subarnarekha	Odisha	4.99	4.93	-	4.12	5.04	-	D	NoHS	NoHS
72	Jaraikela	Koel	Odisha	4.96	4.77	-	4.40	4.88	-	D	IBHS	NoHS
73	Jawahar Bridge, Agra	Yamuna	Uttar Pradesh	2.78	3.21	3.83	4.03	3.12	3.74	IBHS	D	D
74	Jenapur	Brahmani	Odisha	-	4.51	-	-	5.4	-	NoHS	NoHS	NoHS
75	K M Vadi	Cauvery/ Lakshmanthirth	Karnataka	6.44	-	-	3.54	-	-	NHS	NoHS	NoHS
76	K.T.(Satrapur)	Kanhan	Maharashtra	0.73	0.65	0.20	0.20	0.87	0.20	D	IBHS	D
77	Kailash Mandir, Near Benpur Village	Yamuna	Uttar Pradesh	2.83	3.41	4.19	4.94	2.63	3.11	IBHS	D	D
78	Kalindi Kunj	Agra Canal	Delhi	0.84	2.88	1.72	0.29	0.33	0.30	D	D	D
79	Kalpi	Yamuna	Uttar Pradesh	-	5.87	-	-	4.98	-	NoHS	NHS	NoHS
80	Kamalanga	Brahmani	Odisha	-	4.65	-	-	5.4	-	NoHS	NoHS	NoHS
81	Kannauj	Kali	Uttar Pradesh	-	-	6.40	-	-	4.39	NoHS	NoHS	NHS
82	Kasganj	Kali	Uttar Pradesh	4.20	4.41	3.85	5.19	2.58	3.45	NoHS	D	D
83	Kashinagar	Vamsadhara	Odisha	4.70	4.46	4.46	4.28	5.23	6.55	D	NoHS	NoHS
84	Keesara	Munneru	Andhra Pradesh	5.16	4.95	-	*	4.85	-	*	D	NoHS
85	Kenduapada	Kanijhari	Odisha	4.21	-	-	4.87	-	-	IBHS	NoHS	NoHS
86	Keonjhar	Aradei	Odisha	4.84	4.07	4.66	3.69	*	*	D	*	*
87	Kodumudi	Cauvery	Tamil Nadu	6.00	-	-	4.58	-	-	NHS	NoHS	NoHS
88	Kopergaon	Godavari	Maharashtra	*	4.59	*	*	4.54	*	*	D	*
89	Kora	Rind	Uttar Pradesh	-	5.88	-	-	4.83	-	NoHS	NHS	NoHS
90	Kulpatanga	Kharkai	Jharkhand	4.59	4.01	4.63	3.80	5.23	5.56	D	NoHS	NoHS
91	Kusei	Baitarani	Odisha	-	4.79	-	-	5.3	-	NoHS	NoHS	NoHS
92	Lakshmanapatti	Kodaganar	Tamil Nadu	-	-	4.74	-	-	5.1	NoHS	NoHS	NoHS
93	Lala	Katakhal	Assam	*	*	4.10	8.4	*	*	*	*	*
94	Lalpur	Sengar	Uttar Pradesh	-	5.60	-	-	4.14	-	NoHS	NHS	NoHS
95	Lucknow	Gomti	Uttar Pradesh	0.90	2.93	1.58	2.53	2.11	2.37	IBHS	D	IBHS
96	Lupungdhi	Subarnarekha	Jharkhand	4.33	4.58	-	4.34	5.12	-	IBHS	NoHS	NoHS
98	Madhabarida	Badanadi	Odisha	-	4.85	3.81	-	*	*	NoHS	*	*
99	Madhira	Wyra	Telangana	-	4.95	-	-	4.71	-	NoHS	D	NoHS
100	Mahidpur	Shipra	Madhya Pradesh	*	5.21	*	*	4.35	*	*	NHS	*
101	Mangaon	Kal	Maharashtra	*	-	*	*	-	4.60	*	NoHS	*

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post-M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
102	Mantralayam	Tungabhadra	Andhra Pradesh	-	4.80	-	*	5.0	-	*	NoHS	NoHS
103	Meliaputty	Mahendratanaya	Andhra Pradesh	4.87	4.91	5.11	4.55	4.59	*	D	D	*
104	Menangudi	Cauvery/Noolar	Tamil Nadu	-	5.00	5.33	-	4.06	3.68	NoHS	NHS	NHS
105	Mohana	Betwa	Uttar Pradesh	-	5.29	-	-	4.82	-	NoHS	NHS	NoHS
106	Mohna	Yamuna	Haryana	0.20	1.75	0.32	0.24	1.79	0.21	NoHS	IBHS	D
107	Moradabad	Ramganga	Uttar Pradesh	2.53	3.81	-	2.99	3.71	-	NoHS	D	NoHS
108	Munugodu	Edduvagu	Andhra Pradesh	5.82	4.58	-	4.76	5.25	-	NHS	NoHS	NoHS
109	Murappanadu	Tambraparani	Tamil Nadu	5.38	3.71	3.65	4.86	5.46	5.53	NhS	NoHS	NoHS
110	Muri	Subarnarekha	Jharkhand	4.33	-	-	4.36	-	-	IBHS	NoHS	NoHS
111	Musala	Baitarani	Odisha	-	4.65	-	-	5.2	-	NoHS	NoHS	NoHS
112	Nallamaranpatty	Amaravathi	Tamil Nadu	-	4.60	-	-	6.1	-	NoHS	NoHS	NoHS
113	Nallathur	Cauvery/Nandalar	Puducherry	4.99	*	4.77	5.27	-	4.32	NoHS	*	D
114	Nanded	Godavari	Maharashtra	0.37	2.78	1.87	1.12	3.14	5.18	IBHS	IBHS	NoHS
115	Nandipalli	Pennar/Sagileru	Andhra Pradesh	-	5.64	5.88	-	4.90	4.90	NoHS	NHS	NHS
116	Nandira	Brahmani	Odisha	4.88	4.83	-	5.3	5.1	-	NoHS	NoHS	NoHS
117	Nasik	Godavari	Maharashtra	4.06	5.32	4.20	2.86	2.56	1.93	D	NHS	D
118	Neemsar	Gomti	Uttar Pradesh	-	5.43	-	-	4.51	-	NoHS	NHS	NoHS
119	Noida	Yamuna	Uttar Pradesh	0.11	1.26	0.93	0.02	0.87	0.79	D	D	D
120	Okhla Barrage	Yamuna	Delhi	1.07	2.94	1.72	0.25	0.58	0.45	D	D	D
121	Orai-Rath Marg, Chikasi (Sahijina U/S)	Betwa	Uttar Pradesh	-	5.26	-	-	4.98	-	NoHS	NHS	NoHS
122	Paleru Bridge	Paleru	Andhra Pradesh	4.85	4.30	4.48	*	3.76	4.78	*	D	IBHS
123	Palla	Yamuna	Delhi	-	5.24	-	-	4.39	-	NoHS	NHS	NoHS
124	Panposh	Brahmani	Odisha	4.47	4.31	-	4.82	5.07	-	IBHS	NoHS	NoHS
125	Panposh-II	Koel	Odisha	4.80	5.14	-	4.88	4.67	-	IBHS	NHS	NoHS
126	Panposh-I	Sankh	Odisha	4.69	4.94	-	4.90	5.43	-	IBHS	NoHS	NoHS
127	Paramakudi	Vaigai	Tamil Nadu	5.43	*	-	3.90	4.89	-	NHS	*	NoHS
128	Pargaon	Bhima	Maharashtra	*	4.52	*	*	4.39	*	*	D	*
129	Parsohan ghat	Burhi Rapti	Uttar Pradesh	-	5.61	4.69	-	4.47	7.29	NoHS	NHS	NoHS
130	Peralam	Cauvery/Vanjiyar	Tamil Nadu	-	4.49	5.29	-	3.49	3.20	NoHS	D	NHS
131	Pingalwada	Dhadhar	Gujarat	0.34	0.79	*	1.50	0.53	0.54	IBHS	D	*
132	Poiyaghat, Agra	Yamuna	Uttar Pradesh	2.50	2.97	3.86	3.31	3.02	2.95	IBHS	IBHS	D
133	Porakudi	Cauvery/Arasalar	Tamil Nadu	-	4.91	4.86	-	4.36	5.10	NoHS	D	NoHS
134	Purashottampur	Rushikulya	Odisha	4.77	4.74	4.66	4.31	5.25	6.35	D	NoHS	NoHS
135	Purna	Purna	Maharashtra	*	-	4.84	5.5	-	6.8	*	*	NoHS
136	Purunagarh	Brahmani	Odisha	4.47	4.29	4.92	4.43	4.66	5.29	D	IBHS	NoHS
137	Purushottampur	Rushikulya	Odisha	4.77	4.74	4.66	4.3	5.3	6.3	D	NoHS	NoHS
138	R.S. P	Brahmani	Odisha	3.50	3.93	3.46	3.37	4.19	4.36	D	IBHS	IBHS
139	R.S.P-I	Brahmani	Odisha	4.22	4.20	-	4.92	5.14	-	IBHS	NoHS	NoHS
140	R.S.P-II	Brahmani	Odisha	4.48	4.01	-	4.55	4.97	-	IBHS	IBHS	NoHS
141	Raebareli	Sai	Uttar Pradesh	3.67	4.01	-	3.6	2.8	-	D	D	NoHS

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post-M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
142	Rahu	Bhima	Maharashtra	*	4.62	*	*	3.37	*	*	D	*
143	Raebareli	Sai	Uttar Pradesh	3.67	4.01	-	3.61	2.82	-	D	D	NoHS
144	Rajghat	Subarnarekha	Odisha	4.87	4.53	-	4.42	4.64	-	D	IBHS	NoHS
145	Rajghat (Agra)	Betwa	Uttar Pradesh	6.09	4.71	-	4.71	5.49	-	NHS	NoHS	NoHS
146	Roorkee D/S	Solani	Uttarakhand	0.35	1.60	0.52	0.24	0.11	0.00	D	D	D
147	Roorkee U/S	Solani	Uttarakhand	0.44	1.83	0.62	0.23	0.13	0.00	D	D	d
148	Saigaon	Manjera	Karnataka	*	6.06	*	*	4.64	6.97	*	NHS	*
149	Saloora	Godavari	Telangana	-	5.28	-	-	4.78	-	NoHS	NHS	NoHS
150	Sevanur	Chittar	Tamil Nadu	5.36	*	4.34	*	3.47	4.22	*	*	D
151	Shahjahanpur	Khannaut	Uttar Pradesh	3.79	4.44	5.55	3.98	3.63	4.75	IBHS	D	NHS
152	Shimoga	Tunga	Karnataka	6.58	4.89	-	4.97	6.40	-	NHS	NoHS	NoHS
153	Singasadanapalli	Ponnaiyar	Tamil Nadu	0.00	0.00	0.00	0.00	0.00	0.00	D	D	D
154	Singavaram	Pennar/Chitravathi	Andhra Pradesh	*	5.83	5.27	*	4.80	*	*	NHS	*
155	Sitapur	Sarayan	Uttar Pradesh	5.08	2.45	-	4.84	3.48	-	NHS	IBHS	NoHS
156	Sorada	Rushikulya	Odisha	4.85	4.50	4.87	4.44	5.07	6.64	D	NoHS	NoHS
157	Srikakulam	Nagavali	Andhra Pradesh	5.04	4.94	4.88	4.31	4.97	4.88	NHS	IBHS	D
158	Suddakallu	Dindi	Telangana	-	4.58	4.98	-	4.47	5.74	NoHS	D	NoHS
159	Swampatana	Baitarani	Odisha	4.70	-	4.57	4.82	-	6.72	IBHS	NoHS	NoHS
160	T Bekuppe	Arkavathy	Karnataka	3.86	2.80	2.59	1.98	2.38	3.45	D	D	IBHS
161	T K Halli	Shimsha	Karnataka	-	4.21	4.42	*	5.0	5.1	*	NoHS	NoHS
162	Tadipatri	Pennar	Andhra Pradesh	6.89	6.73	*	*	4.33	*	*	NHS	*
163	Talcher	Brahamani	Odisha	5.12	4.99	-	4.66	5.67	-	NHS	NoHS	NoHS
164	Terwad	Panchganga	Maharashtra	*	5.12	*	*	3.94	3.60	*	NHS	*
165	Thengudi	Cauvery/Thirumalairajanar	Tamil Nadu	-	4.91	4.88	-	4.43	4.20	NoHS	D	D
166	Thevur	Sarabenga	Tamil Nadu	3.38	0.92	3.32	5.03	2.31	3.98	NoHS	IBHS	IBHS
167	Thoppur	Thoppaiyar	Tamil Nadu	4.32	*	*	*	*	5.5	*	*	*
168	Tihar Khera	Ramganga	Uttar Pradesh	-	4.21	6.82	-	4.04	3.44	NoHS	D	NHS
169	Tikarapada	Mahanadi	Odisha	5.45	-	-	4.23	-	-	NHS	NoHS	NoHS
170	Tilga	Sankh	Jharkhand	5.40	4.15	-	4.42	5.16	-	NHS	NoHS	NoHS
171	Tondarpur	Sukheta	Uttar Pradesh	4.34	3.07	3.82	4.45	3.05	4.82	IBHS	D	IBHS
172	Udi	Chambal	Uttar Pradesh	-	5.64	-	-	4.30	-	NoHS	NHS	NoHS
173	Ujjain	Shipra	Madhya Pradesh	*	3.60	0.00	*	3.53	5.13	*	D	NoHS
174	Urachikottai	Cauvery	Tamil Nadu	-	2.93	*	-	5.6	6.9	NoHS	NoHS	*
175	Varanavasi	Maruthaiyar	Tamil Nadu	4.98	3.96	-	5.5	*	-	NoHS	*	NoHS
176	Vautha	Sabarmati	Gujarat	0.12	0.95	0.17	0.00	0.74	0.24	D	D	IBHS
177	Vazhavachanur	Ponnaiyar	Tamil Nadu	-	6.11	-	-	4.37	-	NoHS	NHS	NoHS
178	Veligonda	Musi	Telangana	2.58	1.40	1.50	0.64	0.93	1.00	D	D	D
179	Vrindawan Bridge (Mathura U/S)	Yamuna	Uttar Pradesh	1.31	2.16	1.16	0.98	2.26	1.77	D	IBHS	IBHS
180	Wadakbal	Sina	Maharashtra	*	2.73	*	*	4.52	3.50	*	IBHS	*
181	Wadenapally	Krishna	Telangana	2.56	4.27	4.08	5.7	5.7	5.5	NoHS	NoHS	NoHS

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post-M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post-M
182	Watrak Nr Vautha	Watrak	Gujarat	3.72	-	-	*	-	*	*	NoHS	*
183	Yamuna Expessway Road Bridge, Etamadpur	Yamuna	Uttar Pradesh	3.19	3.28	4.87	5.04	3.10	3.81	NoHS	D	D

(-) means No Hotspot

(*) means Data not available/ river dry.

No Hot Spot (NoHS) Deteriorate (D) New Hotspot (NHS) Improved but Hotspot (IBHS)

8.9 Biochemical Oxygen Demand (BOD):

The pre-monsoon season witnessed 107 water quality monitoring stations on 48 rivers across 14 states- Uttar Pradesh, Tamil Nadu, Maharashtra, Bihar, Madhya Pradesh, Delhi, Karnataka, Rajasthan, Haryana, Odisha, Gujarat, Uttarakhand, Telangana and Himachal Pradesh reporting average BOD values exceeding 3.0 mg/l during 2024 as compared to 2023 where 108 Monitoring stations on 46 rivers across 15 states Maharashtra, Uttar Pradesh, Tamil Nadu, Uttarakhand, West Bengal, Rajasthan, Madhya Pradesh, Delhi, Bihar, Chhattisgarh, Haryana, Gujarat, Karnataka, Telangana and Himachal Pradesh.

In the monsoon season, 103 water quality monitoring stations on 48 rivers in 13 states of India- Madhya Pradesh,Uttar Pradesh, Maharashtra, Bihar, Rajasthan, Delhi, Karnataka, Haryana, Tamil Nadu, Andhra Pradesh, Gujarat, Uttarakhand and Telangana exceeded the acceptable limit of BOD during 2024 as compared to 2023 where 132 water quality monitoring stations on 60 rivers in 14 states of India- Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharashtra, Uttarakhand, Delhi, Tamil Nadu, Bihar, Himachal Pradesh, Chhattisgarh, Karnataka, Haryana, Gujarat and Telangana

Finally, in the post-monsoon season, 87 water quality monitoring stations on 36 rivers in 13 states of India- Uttar Pradesh, Odisha, Maharashtra, Madhya Pradesh, Delhi, Bihar, Tamil Nadu, Haryana Andhra Pradesh, Gujarat, Uttarakhand, Karnataka and Telangana recorded average BOD values exceeding 3.0 mg/l during 2024 as compared to 2023 where 102 water quality monitoring stations on 45 rivers in 12 states of India- Uttar Pradesh, Maharashtra, Uttarakhand, Bihar, Madhya Pradesh, Delhi, Tamil Nadu, Haryana, Karnataka, Gujarat, Telangana and Himachal Pradesh

In 2024, the number of water quality monitoring stations decreased for all seasons compared to 2023, indicating improvement in the water quality of the rivers with respect to BOD. During the pre-monsoon, monsoon, and post-monsoon seasons in 2023 and 2024, 81 water quality stations across 41 rivers were identified as common hotspot stations.

Several monitoring stations showed improvement as well as detoriation in water quality from 2023 to 2024. For instance, 30 monitoring stations on 25 rivers experienced tremendous improvement to No-Hotspots in 2024 as compared to 2023 such as Turtipar (Ghaghra River) during all seasons. 9 monitoring stations on 7 rivers like Moradabad (Ramganga River) demonstrated improvement but Hotspot throughout all seasons. Conversely, 6 monitoring stations on 5 rivers like Delhi Railway Bridge (Yamuna River) experienced deterioration in water quality in all seasons. No monitoring station emerged as New Hotspots in all seasons.

During pre-monsoon season, 50 monitoring stations on 37 rivers like Birdghat (Rapti river) demonstrated No-Hotspots in 2024 as compared to 2023. 37 monitoring stations on 19 rivers like Bithoor (Ganga River) showed signs of improvement but still Hotspot. 49 monitoring stations on 16 rivers like Galeta (Hindon River) deteriorated in water quality indicating persistent environmental challenges and potential anthropogenic influences exacerbating water pollution while 18 monitoring stations on 17 rivers like Burhanpur (Tapi River) emerged as New Hotspots.

During monsoon season, 78 monitoring stations on 46 rivers like Elunuthi Mangalam (Noyyal River) showed No-Hotspots in 2024 as compared to 2023. 58 monitoring stations on 28 rivers like Bareilly (Ramganga River) showed signs of improvement but still Hotspot. 33 monitoring stations on 19 rivers like Poiyaghat (Yamuna River) deteriorated in water quality while 13 monitoring stations on 13 rivers like Sultanpur (Gomti River) emerged as New Hotspots.

During post-monsoon season, 73 monitoring stations on 47 rivers like Kachlabridge (Ganga River) showed No-Hotspots in 2024 as compared to 2023. 50 monitoring stations on 19 rivers like Allahabad (Ganga River) showed signs of improvement but still Hotspot. 25 monitoring stations on 15 rivers like Satna (Tons River) deteriorated in water quality while 12 monitoring stations on 10 rivers like Banda (Ken River) emerged as New Hotspots.

Table 27: Comparison of Hot Spots Biochemical Oxygen Demand (BOD) during year 2023 with 2024

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
1	A.B.Road Crossing	Parwati	Madhya Pradesh	*	13.15	*	*	4.95	*	*	IBHS	*
2	A.P.M.(Ashti)	Wainganga	Maharashtra	7.53	-	-	2.76	-	-	NoHS	NoHS	NoHS
3	Akbarpur	Chhoti sarju	Uttar Pradesh	4.89	3.52	3.68	3.97	3.49	3.76	IBHS	IBHS	D
4	Aklera	Parwan	Rajasthan	-	4.14	*	*	1.40	*	*	NoHS	*
5	Alanthurai	Noyyal	Tamil Nadu	4.30	-	*	*	-	*	*	NoHS	*
6	Allahabad	Ganga	Uttar Pradesh	3.13	3.43	3.58	3.56	3.24	3.24	D	IBHS	IBHS
7	Ankinghat	Ganga	Uttar Pradesh	4.33	4.25	4.25	5.93	2.94	3.39	D	NoHS	IBHS

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
8	AP Puram	Chittar	Tamil Nadu	*	*	-	6.71	*	-	*	*	NoHS
9	Aradei	Aradei	Odisha	-	-	1.70	-	-	3.05	NoHS	NoHS	NHS
10	Auraiya	Yamuna	Uttar Pradesh	9.51	6.54	9.25	13.35	3.55	7.56	D	IBHS	IBHS
11	B.P.M. (Bamni)	Wardha	Maharashtra	42.00	26.69	33.33	41.36	26.43	25.27	IBHS	IBHS	IBHS
12	Baghpat	Yamuna	Uttar Pradesh	21.44	22.16	4.25	17.60	2.42	2.61	IBHS	NoHS	NoHS
13	Bairgania	Lalbekia	Bihar	3.80	-	-	3.51	-	-	IBHS	NoHS	NoHS
14	Baleni	Yamuna	Uttar Pradesh	26.14	21.27	38.17	46.22	33.00	34.24	D	D	IBHS
15	Baluaghat	Ganga	Uttar Pradesh	3.16	3.08	3.26	3.43	3.09	3.23	D	D	IBHS
16	Bamni (Nagpur)	Wardha	Maharashtra	4.00	-	2.87	3.63	-	3.27	IBHS	NoHS	NHS
17	Banda	Ken	Uttar Pradesh	-	-	0.96	-	-	3.11	NoHS	NoHS	NHS
18	Bangapani	Gauri Ganga	Uttarakhand	3.63	3.55	3.72	2.16	1.96	1.89	NoHS	NoHS	NoHS
19	Banka	Chandan	Bihar	-	2.54	4.56	-	3.14	2.45	NoHS	NHS	NoHS
20	Banpur	Mathabhanga/ Bhagirathi	West Bengal	6.55	*	*	*	*	*	*	*	*
21	Bansi	Rapti	Uttar Pradesh	-	4.70	6.61	-	5.38	2.25	NoHS	D	NoHS
22	Baranwada	Banas	Rajasthan	*	13.12	*	*	2.04	2.12	*	NoHS	*
23	Bareilly	Ramganga	Uttar Pradesh	18.23	16.23	7.13	8.58	12.48	6.73	D	IBHS	IBHS
24	Barod	Kalisindh	Rajasthan	7.02	4.18	-	2.70	1.93	-	NoHS	NoHS	NoHS
25	Basantpur(Ganga)	Ganga	Uttar Pradesh	3.44	15.05	4.00	2.85	1.85	2.00	NoHS	NoHS	NoHS
26	Basti	Kwano	Uttar Pradesh	5.95	16.05	7.33	9.58	11.65	5.95	D	IBHS	IBHS
27	Basti D/S	Kwano	Uttar Pradesh	8.51	11.53	7.51	12.66	13.45	6.61	D	D	IBHS
28	Basti U/S	Kwano	Uttar Pradesh	6.14	8.07	5.74	6.57	9.50	4.59	D	D	IBHS
29	Bhadana Village D/s of Kota City	Chambal/Parwat i	Rajasthan	*	8.12	*	*	3.89	*	*	IBHS	*
30	Bhadana Village D/s of Kota City	Chambal	Rajasthan	*	8.12	*	*	3.89	*	*	IBHS	*
31	Bhind	Kunwari	Madhya Pradesh	3.42	3.98	3.41	1.30	1.87	3.49	NoHS	NoHS	D
32	Bhitaura	Ganga	Uttar Pradesh	8.81	12.49	6.85	10.43	6.15	4.48	D	IBHS	IBHS
33	Bigod	Banas	Rajasthan	12.28	7.81	*	*	1.35	1.80	*	NoHS	*
34	Birdghat	Rapti	Uttar Pradesh	3.29	4.57	3.54	2.65	3.55	2.03	NoHS	IBHS	NoHS
35	Bithoor	Ganga	Uttar Pradesh	4.22	8.74	4.10	4.08	2.85	2.96	IBHS	NoHS	NoHS
36	Burhanpur	Tapi	Madhya Pradesh	2.80	-	*	3.95	-	1.08	NHS	NoHS	*
37	Chandrika Devi	Gomti	Uttar Pradesh	3.91	4.78	6.37	4.14	5.89	3.31	D	D	IBHS
38	Chandrika Devi (Lko U/S)	Gomti	Uttar Pradesh	3.91	4.78	6.37	4.14	5.89	3.31	D	D	IBHS
39	Chilla Gaon	Hindon Cut	Delhi	28.34	23.37	27.58	54.21	39.84	36.61	D	D	D
40	Chittorgarh	Gambhiri	Rajasthan	*	*	*	*	9.92	*	*	*	*
41	Cholachagudda	MALAPRABHA	Karnataka	1.76	1.74	*	*	3.01	2.26	*	NHS	*
42	D/S (Ashti)	Wainganga	Maharashtra	3.51	5.13	-	2.49	2.00	-	NoHS	NoHS	NoHS
43	Dabri	Ramganga	Uttar Pradesh	8.73	12.83	7.82	11.81	10.76	8.38	D	IBHS	D
44	Dadri	Sahibi	Haryana	*	*	*	*	16.72	*	*	*	*
45	Daund	Bhima	Maharashtra	*	6.69	*	*	7.19	*	*	D	*
46	Delhi Railway Bridge	Yamuna	Delhi	28.61	25.83	26.28	68.14	38.81	42.52	D	D	D
47	Dhaneta	Kitcha/Bahgul	Uttar Pradesh	8.53	17.60	14.03	10.87	7.23	15.07	D	IBHS	D
48	Dhansa	Sahibi	Delhi	*	32.03	*	*	24.67	*	*	IBHS	*

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
49	Dhareri	Chambal	Madhya Pradesh	*	12.49	*	*	4.41	*	*	IBHS	*
50	Dhengbridge	Bagmati	Bihar	-	2.58	2.91	-	3.07	3.11	NoHS	NHS	NHS
51	Dobhi	Phalgu	Bihar	*	-	-	3.53	-	-	*	NoHS	NoHS
52	Elunuthi Mangalam	Noyyal	Tamil Nadu	1.99	4.36	-	3.01	2.64	-	NHS	NoHS	NoHS
53	Etawah	Yamuna	Uttar Pradesh	29.85	15.83	56.33	25.43	18.08	19.26	IBHS	D	IBHS
54	Fatehgarh	Ganga	Uttar Pradesh	4.79	18.95	5.77	7.14	3.65	3.41	D	IBHS	IBHS
55	Galeta	Hindon	Uttar Pradesh	27.26	34.78	67.68	66.04	28.94	43.75	D	IBHS	IBHS
56	Gandhighat	Ganga	Bihar	4.38	3.47	4.12	2.80	2.84	2.45	NoHS	NoHS	NoHS
57	Ganguwala	Yamuna	Himachal Pradesh	-	7.30	-	-	1.63	-	NoHS	NoHS	NoHS
58	Garhmukteshwar	Ganga	Uttar Pradesh	3.90	5.18	4.10	3.66	3.26	2.31	IBHS	IBHS	NoHS
59	Garrauli	Dhasan	Madhya Pradesh	-	2.12	-	-	3.41	-	NoHS	NHS	NoHS
60	Gatora-2	Arpa	Chhattisgarh	3.69	5.18	-	2.31	1.82	-	NoHS	NoHS	NoHS
61	Gaya	Phalgu	Bihar	*	-	3.03	3.24	-	2.22	*	NoHS	NoHS
62	Ghazipur	Ganga	Uttar Pradesh	3.46	3.63	3.63	3.87	3.53	3.32	D	IBHS	IBHS
63	Gokul Barrage II Mathura D/S	Yamuna	Uttar Pradesh	35.27	30.31	28.59	40.50	28.72	32.31	D	IBHS	D
64	Gomti Nagar (Lko D/S)	Gomti	Uttar Pradesh	20.23	25.53	20.77	16.11	19.88	15.26	IBHS	IBHS	IBHS
65	Gopurajapuram	Cauvery/Puravidaiyanar	Tamil Nadu	-	2.01	-	-	3.36	-	NoHS	NHS	NoHS
66	Gorakhpur D/S	Rapti	Uttar Pradesh	2.71	4.45	4.26	3.99	5.47	2.13	NHS	D	NoHS
67	Gorakhpur U/S	Rapti	Uttar Pradesh	1.83	5.03	3.33	3.02	3.67	1.50	NHS	IBHS	NoHS
68	Gudam Bridge	Pranhita	Maharashtra	1.88	-	-	3.73	-	-	NHS	NoHS	NoHS
69	Gummanur	Ponnaiyar	Tamil Nadu	21.63	32.75	43.56	36.78	25.53	30.39	D	IBHS	IBHS
70	Hamirpur	Yamuna	Uttar Pradesh	4.85	-	3.41	6.11	-	5.06	D	NoHS	D
71	Hanging Bridge	Chambal/Parwati	Rajasthan	*	5.69	*	*	3.14	*	*	IBHS	*
72	Hanskhali	Churni/ Bhagirathi	West Bengal	4.27	*	*	*	*	*	*	*	*
73	Hathi Khana	Ganga	Uttar Pradesh	13.21	12.91	11.08	9.09	5.04	4.82	IBHS	IBHS	IBHS
74	Hayaghat	Bagmati	Bihar	-	-	4.45	-	-	2.18	NoHS	NoHS	NoHS
75	Hogenakkal	Chinnar	Tamil Nadu	-	*	4.15	*	1.63	2.63	*	*	NoHS
76	Huvinhedgi	Krishna	Karnataka	-	4.57	-	-	1.69	-	NoHS	NoHS	NoHS
77	Irrukkankudi	Vaippar	Tamil Nadu	*	18.41	6.91	4.27	*	3.58	*	*	IBHS
78	Jajmau	Ganga	Uttar Pradesh	4.57	7.91	5.98	6.21	4.83	3.03	D	IBHS	IBHS
79	Jaunpur	Gomti	Uttar Pradesh	3.07	3.53	3.76	3.96	3.43	3.49	D	IBHS	IBHS
80	Jawahar Bridge, Agra	Yamuna	Uttar Pradesh	20.00	12.75	32.35	18.74	13.97	23.68	IBHS	D	IBHS
81	Jhalawad	Kalisindh	Rajasthan	*	13.89	*	*	1.62	*	*	NoHS	*
82	Jhanjharpur	Kamlabalan	Bihar	-	-	4.08	-	-	1.76	NoHS	NoHS	NoHS
83	K M Vadi	Cauvery/ Lakshmanthirth	Karnataka	2.28	-	-	6.52	-	-	NHS	NoHS	NoHS
84	K.T.(Satrapur)	Kanhan	Maharashtra	70.09	55.41	66.67	70.00	50.71	63.33	IBHS	IBHS	IBHS
85	Kabirganj	Sharda	Uttar Pradesh	-	3.89	4.41	-	1.93	2.02	NoHS	NoHS	NoHS
86	Kachlabridge	Ganga	Uttar Pradesh	3.12	4.26	4.62	4.32	2.88	2.03	D	NoHS	NoHS
87	Kailash Mandir, Near Benpur Village	Yamuna	Uttar Pradesh	25.68	15.51	29.82	22.19	23.05	20.16	IBHS	D	IBHS
88	Kalanaur	Yamuna	Uttar Pradesh	5.89	9.63	-	1.27	1.28	-	NoHS	NoHS	NoHS

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
89	Kalindi Kunj	Agra Canal	Delhi	29.19	29.03	28.19	55.05	46.44	37.89	D	D	D
90	Kalpi	Yamuna	Uttar Pradesh	4.81	-	3.29	5.78	-	5.91	D	NoHS	D
91	Kannauj	Kali	Uttar Pradesh	9.55	6.33	6.68	5.82	7.31	8.11	IBHS	D	D
92	Kanpur	Ganga	Uttar Pradesh	3.53	5.56	3.73	3.55	3.59	2.43	D	IBHS	NoHS
93	Karnal	Yamuna	Haryana	3.25	9.91	-	1.45	1.43	-	NoHS	IBHS	NoHS
94	Kasganj	Kali	Uttar Pradesh	15.09	14.76	15.07	10.13	15.73	11.92	IBHS	D	IBHS
95	Katri Umrauli	Ganga	Uttar Pradesh	3.65	4.81	5.22	4.61	3.57	4.16	D	IBHS	IBHS
96	Kaziupura	Ramganga	Uttar Pradesh	3.73	10.84	4.38	3.75	5.68	5.90	D	IBHS	D
97	Keolari	Wainganga	Madhya Pradesh	-	2.80	2.20	-	3.03	3.00	NoHS	NHS	NHS
98	Khatoli	Parwati	Rajasthan	5.18	4.89	-	1.60	1.62	-	NoHS	NoHS	NoHS
99	Koggedoddi	Arkavathi	Karnataka	-	2.14	-	-	4.50	-	NoHS	NHS	NoHS
100	Kokiwada	Pench	Madhya Pradesh	-	4.08	3.27	-	1.56	1.27	NoHS	NoHS	NoHS
101	Kota-By Pass Hanging Road Bridge U/S of Kota City	Chambal	Rajasthan	*	5.69	*	*	3.14	*	*	IBHS	*
102	Kudlur	Palar	Tamil Nadu	*	*	*	*	3.20	0.78	*	*	*
103	Kurundwad	Krishna	Maharashtra	*	1.49	*	*	3.83	1.10	*	NHS	*
104	Lakhisarai	Kiul	Bihar	4.97	-	3.27	1.93	-	1.73	NoHS	NoHS	NoHS
105	Lakshmanapatti	Kodaganar	Tamil Nadu	-	5.36	-	-	2.33	-	NoHS	NoHS	NoHS
106	Lucknow	Gomti	Uttar Pradesh	27.24	15.06	19.18	18.09	17.22	15.76	IBHS	D	IBHS
107	Madla	Ken	Madhya Pradesh	*	-	1.10	*	-	3.38	*	NoHS	NHS
108	Mahidpur	Shipra	Madhya Pradesh	*	15.93	*	*	8.44	*	*	IBHS	*
109	Maighat	Gomti	Uttar Pradesh	3.08	-	3.06	3.21	-	3.24	D	NoHS	D
110	Mandawara	Chambal	Rajasthan	13.50	8.70	-	13.00	1.84	-	IBHS	NoHS	NoHS
111	Manderial	Chambal	Rajasthan	12.42	10.04	-	2.13	1.60	-	NoHS	NoHS	NoHS
112	Mawi	Yamuna	Uttar Pradesh	11.71	14.31	-	22.98	2.34	-	D	NoHS	NoHS
113	Mehandipur	Ganga	Uttar Pradesh	6.53	7.05	7.40	5.40	5.30	5.22	IBHS	IBHS	IBHS
114	Mirzapur	Ganga	Uttar Pradesh	3.08	3.41	3.49	3.68	3.33	3.49	D	IBHS	D
115	Mohna	Yamuna	Haryana	27.48	30.49	34.71	48.93	24.85	24.27	D	IBHS	IBHS
116	Moradabad	Ramganga	Uttar Pradesh	23.93	16.29	11.15	16.62	13.32	6.97	IBHS	IBHS	IBHS
117	Motinaroli	Kim	Gujarat	-	5.29	*	-	1.73	1.41	NoHS	NoHS	*
118	Mungoli	Penganga	Maharashtra	6.32	-	-	2.91	-	-	NoHS	NoHS	NoHS
119	Murappanadu	Tambraparani	Tamil Nadu	-	6.53	3.19	-	2.88	2.05	NoHS	NoHS	NoHS
120	Mushal	Baitarani	Odisha	2.07	-	-	3.11	-	-	NHS	NoHS	NoHS
121	Naidupet	Swarnamukhi	Andhra Pradesh	-	2.28	-	-	3.10	-	NoHS	IBHS	NoHS
122	Nallamaranpatty	Amaravathi	Tamil Nadu	0.90	10.54	-	3.29	1.40	-	NHS	NoHS	NoHS
123	Nanded	Godavari	Maharashtra	18.04	10.20	3.99	5.53	4.49	3.83	IBHS	IBHS	IBHS
124	Nandgaon	Wunna	Maharashtra	7.52	5.44	-	1.85	2.10	-	NoHS	NoHS	NoHS
125	Nasik	Godavari	Maharashtra	3.25	3.91	2.02	2.43	2.05	8.10	NoHS	NoHS	NHS
126	Neemsar	Gomti	Uttar Pradesh	5.87	8.28	4.28	4.96	5.74	3.04	IBHS	IBHS	IBHS
127	Noida	Yamuna	Uttar Pradesh	25.85	28.26	53.87	65.62	52.92	37.75	D	D	IBHS
128	Okhla Barrage	Yamuna	Delhi	29.21	29.81	37.14	57.94	33.33	37.64	D	D	D

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
129	P.G.Bridge	Penganga	Maharashtra	-	-	1.93	-	-	3.17	NoHS	NoHS	NHS
130	Paleru Bridge	Krishna	Andhra Pradesh	1.40	-	1.67	*	-	3.46	*	NoHS	NHS
131	Pali	Chambal	Rajasthan	6.54	9.43	-	1.79	2.13	-	NoHS	NoHS	NoHS
132	Paliakalan	Sharda	Uttar Pradesh	1.88	3.19	3.63	3.22	2.26	1.38	NHS	NoHS	NoHS
133	Palla	Yamuna	Delhi	18.46	12.43	9.00	18.23	8.59	2.40	IBHS	IBHS	NoHS
134	Paramakudi	Vaigai	Tamil Nadu	1.55	*	-	6.37	2.54	-	NHS	*	NoHS
135	Pargaon	Bhima	Maharashtra	*	9.25	*	*	7.81	*	*	IBHS	*
136	Parmat Ghat	Ganga	Uttar Pradesh	3.77	8.33	5.85	4.05	3.34	3.47	D	IBHS	IBHS
137	Parsohan Ghat	Budhi Rapti	Uttar Pradesh	2.14	6.76	12.62	3.57	6.38	3.50	NHS	IBHS	IBHS
138	Patala	Wardha	Maharashtra	2.29	-	-	3.28	-	-	NHS	NoHS	NoHS
139	Patansaongi	Chandrabhaga	Maharashtra	-	4.90	-	-	1.98	-	NoHS	NoHS	NoHS
140	Pauni	Wainganga	Maharashtra	5.72	-	-	3.71	-	-	IBHS	NoHS	NoHS
141	Pingalwada	Dhadhar	Gujarat	11.36	14.75	*	13.73	15.08	18.45	D	D	*
142	Poanta	Yamuna	Himachal Pradesh	-	5.53	-	-	1.48	-	NoHS	NoHS	NoHS
143	Poiyaghat, Agra	Yamuna	Uttar Pradesh	23.43	14.63	23.14	20.71	21.61	20.00	IBHS	D	IBHS
144	Pratapgarh	Sai	Uttar Pradesh	3.64	3.38	3.75	4.05	3.51	3.80	D	IBHS	D
145	Purna	Purna	Maharashtra	*	-	2.05	2.43	-	3.48	*	NoHS	NHS
146	Raebareli	Sai	Uttar Pradesh	13.81	9.37	7.55	10.67	13.33	5.51	IBHS	D	IBHS
147	Rahu (Mirawadi)	Mula-Mutha	Maharashtra	*	7.72	*	*	11.21	*	*	D	*
148	Rajapur	Yamuna	Uttar Pradesh	-	-	2.93	-	-	3.69	NoHS	NoHS	NHS
149	Ramakona	Kanhan	Madhya Pradesh	4.11	3.20	-	1.68	1.91	-	NoHS	NoHS	NoHS
150	Regauli	Rapti	Uttar Pradesh	-	4.30	3.33	-	3.64	1.57	NoHS	IBHS	NoHS
151	Renukaji	Giri	Himachal Pradesh	-	7.74	-	-	1.49	-	NoHS	NoHS	NoHS
152	Roorkee D/S	Solani	Uttarakhand	25.09	26.85	21.00	27.50	20.87	18.00	D	IBHS	IBHS
153	Roorkee U/S	Solani	Uttarakhand	23.81	24.88	19.99	24.67	17.40	14.67	D	IBHS	IBHS
154	Saidpur	Ganga	Uttar Pradesh	3.86	-	3.09	3.25	-	3.30	IBHS	NoHS	D
155	Sakhara	Wainganga	Maharashtra	2.16	-	-	3.39	-	-	NHS	NoHS	NoHS
156	Sarangpur	Kalisindh	Madhya Pradesh	*	15.28	*	*	1.93	*	*	NoHS	*
157	Satna	Tons	Madhya Pradesh	3.34	3.10	3.29	3.46	3.16	3.44	D	D	D
158	Seohara	Ramganga	Uttar Pradesh	4.12	8.47	4.40	4.29	5.69	5.76	D	IBHS	D
159	Sevanur	Chittar	Tamil Nadu	8.22	*	9.67	*	1.98	0.55	*	*	NoHS
160	Shahjahanpur	Khannaut	Uttar Pradesh	15.47	11.54	7.05	10.33	11.54	6.63	IBHS	D	IBHS
161	Shastri Bridge	Ganga	Uttar Pradesh	3.15	3.34	3.57	3.76	3.41	3.30	D	D	IBHS
162	Shimoga	Tunga	Karnataka	1.57	-	0.79	3.03	-	*	NHS	NoHS	*
163	Sikandarpur	Burhi Gandak	Bihar	3.32	-	3.86	2.75	-	2.08	NoHS	NoHS	NoHS
164	Singasadanapalli	Ponnaiyar	Tamil Nadu	50.86	79.46	75.80	61.17	70.96	66.43	D	D	IBHS
165	Sitapur	Sarayan	Uttar Pradesh	14.85	15.14	6.53	10.83	12.42	5.36	IBHS	D	IBHS
166	Sripalpur	Punpun	Bihar	2.72	-	-	3.21	-	-	NHS	NoHS	NoHS
167	Sultanpur	Gomti	Uttar Pradesh	3.78	2.95	3.20	3.36	3.06	3.62	IBHS	NHS	D
168	T Bekuppe	Arkavathy	Karnataka	9.17	11.38	6.72	8.50	7.38	9.38	IBHS	IBHS	D
169	T K Halli	Shimsha	Karnataka	2.01	1.37	-	*	3.20	-	*	NHS	NoHS

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
170	Tal	Chambal	Madhya Pradesh	*	3.98	*	*	1.94	*	*	NoHS	*
171	Tanda D/S	Ghaghra	Uttar Pradesh	2.33	3.83	3.44	3.37	2.93	1.91	NHS	NoHS	NoHS
172	Tanda U/S	Ghaghra	Uttar Pradesh	-	3.68	3.90	-	1.82	1.91	NoHS	NoHS	NoHS
173	Terwad	Panchganga	Maharashtra	*	1.32	*	*	5.28	6.80	*	NHS	*
174	Thevur	Sarabenga	Tamil Nadu	3.61	6.92	6.05	4.74	6.12	2.19	D	IBHS	NoHS
175	Tihar Khera	Ramganga	Uttar Pradesh	7.49	14.21	5.18	8.50	15.88	9.11	D	D	D
176	Tondarpur	Sukheta	Uttar Pradesh	7.44	13.36	10.33	10.18	10.62	5.76	D	IBHS	IBHS
177	Turtipar	Ghaghra	Uttar Pradesh	-	3.33	3.07	-	2.01	1.37	NoHS	NoHS	NoHS
178	U/S (Bamni)	Wardha	Maharashtra	3.91	3.27	2.63	3.61	3.46	3.60	IBHS	D	NHS
179	U/S (Satrapur)	Kanhan	Maharashtra	1.67	-	-	4.53	-	-	NHS	NoHS	NoHS
180	Udi	Chambal	Uttar Pradesh	-	-	3.25	-	-	5.51	NoHS	NoHS	D
181	Ujjain	Shipra	Madhya Pradesh	*	20.09	16.04	*	13.42	2.80	*	IBHS	NoHS
182	Urachikottai	Cauvery	Tamil Nadu	1.40	4.90	*	5.53	1.54	1.56	NHS	NoHS	*
183	V S Bridge	Ganga	Uttar Pradesh	3.33	3.70	3.76	3.81	3.61	3.26	D	IBHS	IBHS
184	Varanasi	Ganga	Uttar Pradesh	3.65	2.86	3.20	3.47	3.01	3.35	IBHS	NHS	D
185	Varanavasi	Maruthaiyar	Tamil Nadu	3.52	6.70	-	2.76	*	-	NoHS	*	NoHS
186	Vautha	Sabarmati	Gujarat	30.14	15.02	26.09	23.66	18.05	19.83	IBHS	D	IBHS
187	Veligonda	Musi	Telangana	16.53	16.67	11.53	11.18	13.89	49.24	IBHS	IBHS	D
188	Vrindawan Bridge (Mathura U/S)	Yamuna	Uttar Pradesh	36.03	32.07	35.10	35.77	30.87	33.52	IBHS	IBHS	IBHS
189	Wadakbal	Sina	Maharashtra	*	5.72	*	*	5.24	1.70	*	IBHS	*
190	Wairagarh	Khobragadi	Maharashtra	-	4.08	-	-	1.34	-	NoHS	NoHS	NoHS
191	Watrak Nr Vautha	Watrak	Gujarat	10.02	2.28	5.46	*	3.80	*	*	NHS	*
192	Yamuna Expessway Road Bridge, Etamadpur	Yamuna	Uttar Pradesh	27.20	17.48	33.55	22.01	21.68	24.16	IBHS	D	IBHS
193	Yashwant Nagar	Giri	Himachal Pradesh	7.08	9.89	7.08	6.34	2.04	1.30	IBHS	NoHS	NoHS

(-) means No Hotspot

(*) means Data not available/ river dry.

No Hot Spot (NoHS)

Deteriorate (D)

New Hotspot (NHS)

Improved but Hotspot (IBHS)

8.10 Total Coliform (TC):

An analysis of water quality hotspots across various sites and rivers during 2023 and 2024 reveals significant trends and changes. Sites were categorized based on pre-monsoon (Pre-M), monsoon (M), and post-monsoon (post-M) periods.

Several locations showed improved water quality during the pre-monsoon, monsoon, and post-monsoon periods of 2024 compared to 2023. The analysis reveals the distribution of stations categorized across different seasons.

In the pre-monsoon season, 227 water quality monitoring stations across 16 states of India- Maharashtra, Assam, Uttar Pradesh, Karnataka, Tamil Nadu, Bihar, Madhya Pradesh, Uttarakhand, Rajasthan, Andhra Pradesh, Telangana, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Haryana, Puducherry, Kerala and Odishareported average TC values exceeding 500 MPN/100 ml during 2024 as compared to 2023 where 199 water quality monitoring stations on 97 rivers across 16 states of India Uttar Pradesh, Karnataka, Rajasthan, Tamil Nadu, Andhra Pradesh, Maharashtra, Madhya Pradesh, Telangana, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Uttarakhand, Haryana, Kerala and Odisha exceeding 500 MPN/100 ml TC.

In the monsoon season, 359 water quality monitoring stations in 19 states of India- Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, Kerala, Bihar, Uttarakhand, Assam, Telangana, Chhattisgarh, Gujarat, Haryana, Delhi, Himachal Pradesh, Jharkhand and Odisha similar findings during 2024 as compared to 2023 where 258 water quality monitoring stations on 124 rivers across 17 states of India- Madhya Pradesh, Maharashtra, Rajasthan, Assam, Uttar Pradesh, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Chhattisgarh, Gujarat, Delhi, Himachal Pradesh, Uttarakhand, Haryana, Kerala and Odisha exceeding 500 MPN/100 ml TC.

Finally, in the post-monsoon season, 317 water quality monitoring stations in 20 states of India- Maharashtra, Rajasthan,Karnataka, Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Kerala, Bihar, Madhya Pradesh, Uttarakhand, Telangana, Assam, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Jharkhand, Haryana, Puducherry and Odisha recorded average TC values exceeding 500 MPN/100 ml during 2024 as compared to 2023 where 215 water quality monitoring stations on 111 rivers across 17 states of India- Tamil Nadu, Maharashtra, Rajasthan, Assam, Uttar Pradesh, Karnataka, Madhya Pradesh, Andhra Pradesh, Telangana, Chhattisgarh, Gujarat, Delhi, Himachal Pradesh, Uttarakhand, Haryana, Puducherry, Kerala and Odisha exceeding 500 MPN/100 ml TC.

Several monitoring stations showed improvement while other demostrated detoriation in water quality from 2023 to 2024. For instance, 38 monitoring stations on 20 rivers like Varanasi (Ganga River) demonstrated improvement but Hotspot in 2024 as compared to 2023 during all seasons. Conversely, 28

monitoring stations on 21 rivers like Muthenkera (Kabini River) experienced deterioration in water quality in all seasons. No monitoring stations emerged as No Hotspots and New Hotspots in all seasons.

During pre-monsoon season, 8 monitoring stations on 7 rivers like Kumhari (Wainganga River) demonstrated No-Hotspots in 2024 as compared to 2023. 107 monitoring stations on 57 rivers like V.S. Bridge (Ganga River) showed signs of improvement but still Hotspot. 63 monitoring stations on 38 rivers like Derol Bridge (Sabarmati River) deteriorated in water quality indicating persistent environmental challenges and potential anthropogenic influences exacerbating water pollution while 2 monitoring stations on 2 rivers like Nandipalli (Sagileru River) emerged as New Hotspots.

During monsoon season, 11 monitoring stations on 11 rivers like Chaklagaon (Manas River) showed No-Hotspots in 2024 as compared to 2023. 107 monitoring stations on 56 rivers like Varanasi (Ganga River) showed signs of improvement but still Hotspot. 140 monitoring stations on 78 rivers like Auraiya (Yamuna River) deteriorated in water quality while 6 monitoring stations on 5 rivers like Beki Road Bridge (Beki River) emerged as New Hotspots.

During post-monsoon season, 12 monitoring stations on 11 rivers like Sonapur (Digaru River) showed No-Hotspots in 2024 as compared to 2023. 87 monitoring stations on 46 rivers like Galeta (Hindon River) showed signs of improvement but still Hotspot. 118 monitoring stations on 67 rivers like Nanded (Godavari River) deteriorated in water quality while 6 monitoring stations on 6 rivers like Madardhara (Wainganga River) emerged as New Hotspots.

Table 28: Comparison of Hot Spots Total Coliform (TC) during year 2023 with 2024

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
1	A.B. Road Crossing	Parwati	Madhya Pradesh	*	113990	*	*	174700	*	*	D	*
2	A.P. Puram	Chittar	Tamil Nadu	*	*	7450	7950	*	4900	*	*	IBHS
3	A.P.M.(Ashti)	Wainganga	Maharashtra	*	10933	11300	10160	5907	8605	*	IBHS	IBHS
4	Abu Road	Banas	Rajasthan	*	18600	18200	*	7988	8200	*	IBHS	IBHS
5	Addoor	Gurupur	Karnataka	*	*	*	*	910	940	*	*	*
6	Aie NH Xing	Aie	Assam	*	1911	1567	3000	371	210	*	NoHS	NoHS
7	Akbarpur	Chhoti sarju	Uttar Pradesh	7873	7920	5367	5433	3673	4383	IBHS	IBHS	IBHS
8	Akkihebbal	Hemavati	Karnataka	92245	248267	136800	303500	430600	188667	D	D	D
9	Aklera	Parwan	Rajasthan	79000	63889	*	*	33000	*	*	IBHS	*
10	Alandurai	Noyyal	Tamil Nadu	4900	26000	*	*	18963	*	*	IBHS	*
11	Alanthurai	Noyyal	Tamil Nadu	4900	26000	*	*	18963	*	*	IBHS	*
12	Alladupalli	Kunderu	Andhra Pradesh	2431	1545	270	360	1727	1767	NoHS	D	NHS
13	Allahabad	Ganga	Uttar Pradesh	7227	8067	6883	5687	4733	4800	IBHS	IBHS	IBHS
14	Ambarampalayam	Bharathapuzha	Tamil Nadu	11547	11613	12150	17120	19000	23167	D	D	D
15	Ambasamudram	Vaigai	Tamil Nadu	37633	*	3050	11700	44500	8683	IBHS	*	D
16	Ankinghat	Ganga	Uttar Pradesh	*	*	*	2700	2300	2100	*	*	*
17	Arangaly	Chalakudy	Kerala	*	*	*	*	*	1250	*	*	*
18	Arcot	Palar	Tamil Nadu	16000	1810	6150	2243	7389	5200	IBHS	D	IBHS
19	Arjunwad	Krishna	Maharashtra	*	42071	*	*	31000	21833	*	D	*
20	Arnota	Uttangan	Uttar Pradesh	*	*	*	*	4700	*	*	*	*
21	Ashramam	Pazhayar	Tamil Nadu	*	*	*	*	2233	2850	*	*	*
22	Asthi	Wainganga	Maharashtra	1642	4187	3430	2322	3988	7350	D	IBHS	D
23	Auraiya	Yamuna	Uttar Pradesh	110360	62980	58140	143627	180444	10533	D	D	IBHS

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
24	Avarankuppam	Palar	Tamil Nadu	9633	3300	*	*	9450	35000	*	D	*
25	Avershe	Seetha	Karnataka	*	*	*	*	690	1750	*	*	*
26	Ayilam	Vamanapuram	Kerala	*	*	*	*	790	1350	*	*	*
27	Ayodhya	Ghaghra	Uttar Pradesh	*	*	*	3100	2500	*	*	*	*
28	Azamabad	Ganga	Bihar	*	*	*	582	2784	2840	*	*	*
29	B.P.M. (Bamni)	Wardha	Maharashtra	*	11767	13733	16000	13615	11172	*	D	IBHS
30	Badlapur	Ulhas	Maharashtra	72067	104000	63333	107333	87333	60000	D	IBHS	IBHS
31	Baghpat	Yamuna	Uttar Pradesh	477867	105000	136667	282786	83533	47167	IBHS	IBHS	IBHS
32	Bakhari	Wainganga	Madhya Pradesh	3771	1511	1405	784	4209	4122	IBHS	D	IBHS
33	Baleni	Yamuna	Uttar Pradesh	1766000	996000	833333	1181429	426667	1798333	IBHS	IBHS	D
34	Balrampur	Rapti	Uttar Pradesh	*	*	*	2200	2250	2400	*	*	*
35	Baluaghat	Ganga	Uttar Pradesh	7027	7393	7117	6940	6100	5900	IBHS	IBHS	IBHS
36	Bamni(Nagpur)	Wardha	Maharashtra	3709	3552	2750	1611	5646	10367	IBHS	D	D
37	Banda	Ken	Uttar Pradesh	1780	6742	1830	5000	5800	6767	D	IBHS	D
38	Bangapani	Gauri Ganga	Uttarakhand	*	*	*	940	880	1100	*	*	*
39	Banjari	Sone	Bihar	*	*	*	*	5067	3800	*	*	*
40	Banka	Chandan	Bihar	*	*	*	*	2650	1650	*	*	*
41	Bansi	Rapti	Uttar Pradesh	*	*	*	1400	1850	2100	*	*	*
42	Bantwal	Netravathi	Karnataka	*	*	*	*	1147	1200	*	*	*
43	Baranwada	Banas	Rajasthan	*	127583	*	*	92091	40333	*	IBHS	*
44	Bareilly	Ramganga	Uttar Pradesh	*	*	*	*	33000	21000	*	*	*
45	Barod	Kalisindh	Rajasthan	111917	43455	45000	44545	63400	77667	IBHS	D	D
46	Basantpur (Ganga)	Ganga	Uttar Pradesh	*	*	*	*	4350	4700	*	*	*
47	Basoda	Betwa	Madhya Pradesh	3800	3913	*	5373	4733	3117	D	D	*
48	Basti	Kwano	Uttar Pradesh	*	*	*	*	7800	*	*	*	*

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
49	Basti D/S	Kwano	Uttar Pradesh	*	*	*	*	9200	*	*	*	*
50	Basti U/S	Kwano	Uttar Pradesh	*	*	*	*	6800	*	*	*	*
51	Bawapuram	Tungabhadra	Andhra Pradesh	2981	1800	1900	1400	5871	11967	IBHS	D	D
52	Beki Road Bridge	Beki	Assam	*	130	627	3500	565	80	*	NHS	NoHS
53	Belne Bridge	Gad	Maharashtra	20217	381333	26040	182600	349857	188667	D	IBHS	D
54	Bendrahalli	Suvarnavathi	Karnataka	450067	469933	334000	706667	444000	1033333	D	IBHS	D
55	Bhadana Village D/s of Kota City	Chambal/Parwati	Rajasthan	*	119750	*	*	75286	*	*	IBHS	*
56	Bhadrachelam	Godavari	Telangana	1559	2367	2900	1753	4767	8440	D	D	D
57	Bhatpalli	Peddavagu	Telangana	2876	3417	2900	2115	7238	6372	IBHS	D	D
58	Bhind	Kunwari	Madhya Pradesh	16144	24867	3900	4700	5914	6700	IBHS	IBHS	D
59	Bhitaura	Ganga	Uttar Pradesh	*	*	*	7000	*	7800	*	*	*
60	Bigod	Banas	Rajasthan	89333	119667	*	*	38600	45600	*	IBHS	*
61	Biligundulu	Cauvery	Tamil Nadu	14919	9220	5933	7940	11933	12070	IBHS	D	D
62	Birdghat	Rapti	Uttar Pradesh	*	*	*	4850	26500	*	*	*	*
63	Bithoor	Ganga	Uttar Pradesh	*	*	*	4700	7700	5800	*	*	*
64	Buxar	Ganga	Bihar	*	*	*	507	2756	2450	*	*	*
65	Byladahalli	Haridra	Karnataka	*	277625	21750	*	505000	148333	*	D	D
66	Chaklagaon	Manas	Assam	*	886	1267	3400	493	97	*	NoHS	NoHS
67	Chandrika Devi	Gomti	Uttar Pradesh	*	*	*	4900	3650	4700	*	*	*
68	Changsari	Kurijali	Assam	*	1050	1167	340	1097	1822	*	D	D
69	Chengalpet	Palar	Tamil Nadu	1190	5563	3000	2033	3625	1683	D	IBHS	IBHS
70	Chennur	Pennar	Andhra Pradesh	617	967	243	*	2075	2067	*	D	NHS
71	Chindnar	Indravathi	Chhattisgarh	1836	3173	2928	2136	4127	7933	D	D	D
72	Chitrasani	Balaram	Gujarat	*	22000	17000	*	7750	*	*	IBHS	*
73	Chittorgarh	Gambhiri	Rajasthan	*	*	*	*	170000	*	*	*	*

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
74	Cholachagudda	Malaprabha	Karnataka	59314	496556	*	*	11580000	1446667	*	D	*
75	Chopan	Sone	Uttar Pradesh	4753	4693	3600	2375	1249	1280	IBHS	IBHS	IBHS
76	Chunchunkatte	Cauvery	Karnataka	160000	411900	*	920000	309333	232000	D	IBHS	*
77	D/S (Ashti)	Wainganga	Maharashtra	*	7913	11467	5407	2801	4278	*	IBHS	IBHS
78	Dabri	Ramganga	Uttar Pradesh	*	*	*	*	22000	20000	*	*	*
79	Dadri	Sahibi	Haryana	*	*	*	*	107250	*	*	*	*
80	Dameracherla	Musi	Telangana	2253	2372	2700	1400	7550	13733	IBHS	D	D
81	Daund	Bhima	Maharashtra	*	60500	*	*	76357	*	*	D	*
82	Delhi Railway Bridge	Yamuna	Delhi	74533333	22333333	10500000	15492857	6066667	5666667	IBHS	IBHS	IBHS
83	Deongaon Bridge	Bhima	Karnataka	*	4733	*	*	6338	12600	*	D	*
84	Deosugar	Krishna	Karnataka	3253	2207	2100	1667	4407	10517	IBHS	D	D
85	Derol Bridge	Sabarmati	Gujarat	8460	34364	20167	10050	7411	8400	D	IBHS	D
86	Dhalegaon	Godavari	Maharashtra	*	1960	1717	1550	5785	9700	*	D	D
87	Dhaneta	Baigul/Kicha	Uttar Pradesh	*	*	*	*	20000	21000	*	*	*
88	Dhansa	Sahibi	Delhi	*	611667	*	*	464167	*	*	IBHS	*
89	Dhareri	Chambal	Madhya Pradesh	*	762000	*	*	1200000	*	*	D	*
90	Dholpur	Chambal	Rajasthan	16033	14618	8260	10108	3978	5233	IBHS	IBHS	IBHS
91	Dobhi	Phalgu	Bihar	*	*	*	*	2850	4800	*	*	*
92	Duddhi	Kanhar	Uttar Pradesh	4673	3333	3233	2149	1467	1837	IBHS	IBHS	IBHS
93	Dudhnoi	Dhudnoi	Assam	*	459	933	300	1188	760	*	D	IBHS
94	Elgin bridge	Ghaghra	Uttar Pradesh	*	*	*	1520	2250	*	*	*	*
95	Elunuthi Mangalam	Noyyal	Tamil Nadu	20320	16240	29000	13985	34693	23467	IBHS	D	IBHS
96	Erinjipuzha	Payaswini	Kerala	*	*	*	*	827	1095	*	*	*
97	Etawah	Yamuna	Uttar Pradesh	715467	206267	980000	666167	142889	445000	IBHS	D	IBHS
98	Faizabad U/S	Ghaghra	Uttar Pradesh	*	*	*	*	2700	*	*	*	*

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										Pre-M	M	Post- M
99	Fatehgarh	Ganga	Uttar Pradesh	*	*	*	2250	3850	*	*	*	*
100	Gaisabad	Bearma	Madhya Pradesh	3050	2957	3167	*	6600	3967	*	D	D
101	Galeta	Hindon	Uttar Pradesh	50960000	7173333	14800000	13842857	1526667	5450000	IBHS	IBHS	IBHS
102	Gandhavayal	Gandhayar	Tamil Nadu	49658	15667	4867	11463	18993	20333	IBHS	D	D
103	Gandhighat	Ganga	Bihar	*	*	*	1110	3447	2767	*	*	*
104	Gandlapet	Peddavagu	Telangana	3335	1810	2433	1666	6310	10700	IBHS	D	D
105	Ganguwala	Yamuna	Himachal Pradesh	16653	35400	24500	28857	35200	29833	D	IBHS	D
106	Ganod	Bhadar	Gujarat	*	27190	*	*	10830	4983	*	IBHS	*
107	Garhakota	Sonar	Madhya Pradesh	*	6150	*	*	17000	*	*	D	*
108	Garhmukteshwar	Ganga	Uttar Pradesh	*	*	*	1150	1467	1300	*	*	*
109	Garhwa	North Koel	Jharkhand	*	*	*	*	2283	1900	*	*	*
110	Garrauli	Dhasan	Madhya Pradesh	1651	11267	5016	5271	4560	2530	D	IBHS	IBHS
111	Gaya	Phalgu	Bihar	*	*	*	*	2667	1900	*	*	*
112	Ghat	Sarju	Uttarakhand	*	*	*	700	785	920	*	*	*
113	Ghazipur	Ganga	Uttar Pradesh	6733	7393	5833	7253	4660	6033	D	IBHS	D
114	Goalpara	Brahmaputra	Assam	*	1100	*	*	*	*	*	*	*
115	Gokak	Ghataprabha	Karnataka	*	447300	17000	280000	4733333	542333	*	D	D
116	Gokul Barrage II Mathura D/S	Yamuna	Uttar Pradesh	5004667	9133333	9700000	7764286	5400000	1850000	D	IBHS	D
117	Gomti Nagar	Gomti	Uttar Pradesh	*	*	*	170000	125000	140000	*	*	*
118	Gopurajapuram	Puravidlyanar	Tamil Nadu	*	5400	-	607	302	-	*	NoHS	*
119	Gorakhpur D/S	Rapti	Uttar Pradesh	*	*	*	*	36000	*	*	*	*
120	Gorakhpur U/S	Rapti	Uttar Pradesh	*	*	*	*	26500	*	*	*	*
121	GR Bridge	Godavari	Maharashtra	2353	2440	2450	1258	5808	7900	IBHS	D	D
122	Gudam Bridge	Pranhita	Maharashtra	739	1342	285	307	1354	2400	NoHS	D	D
123	Gummanur	Ponnaiyar	Tamil Nadu	79533	26947	17133	14613	43286	5400	IBHS	D	IBHS

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										Pre-M	M	Post- M
124	Guwahati D.C.Court	Brahmaputra	Assam	-	562	3103	-	1908	572	NoHS	D	IBHS
125	Halady	Halady	Karnataka	*	*	*	*	1333	1950	*	*	*
126	Halia	Halia	Telangana	1992	3425	*	*	10913	9700	*	D	*
127	Hamirpur	Yamuna	Uttar Pradesh	38887	17203	9020	68345	35200	7867	D	D	IBHS
128	Hanging Bridge	Chambal/Parwati	Rajasthan	*	20250	*	*	75333	*	*	D	*
129	Haralahalli	Tungabhadra	Karnataka	40086	295727	24250	580000	364667	159667	D	D	D
130	Hariharapura	Tunga	Karnataka	101800	181667	90800	314533	594667	390667	D	D	D
131	Haripur	Tons	Uttarakhand	14927	40200	25167	19929	28667	15667	D	IBHS	IBHS
132	Hathidah	Ganga	Bihar	*	*	*	895	3299	3617	*	*	*
133	Hathikhana	Ganga	Uttar Pradesh	*	*	*	*	5833	6300	*	*	*
134	Hivra	Wardha	Maharashtra	1571	2634	933	1861	5500	4885	D	D	D
135	Hogenakkal	Chinnar	Tamil Nadu	28000	*	54000	*	19500	14000	*	*	IBHS
136	Holehonnur	Bhadra	Karnataka	112400	411533	56560	310000	522667	159667	D	D	D
137	Honnali	Tungabhadra	Karnataka	190427	565400	20240	235800	329333	402000	D	IBHS	D
138	Hoovinahole	Swarnamukhi	Karnataka	30800	*	*	*	*	*	*	*	*
139	Huvinhedgi	Krishna	Karnataka	2293	2383	3033	2025	5850	10333	IBHS	D	D
140	Irrukkankudi	Vaippar	Tamil Nadu	*	56667	23200	26271	*	8950	*	*	D
141	Jagdalpur	Indravathi	Chhattisgarh	1973	2940	1440	1871	4660	10200	IBHS	D	D
142	Jajmau	Ganga	Uttar Pradesh	*	*	*	13000	15000	12000	*	*	*
143	Japla	Sone	Jharkhand	*	*	*	*	2333	1240	*	*	*
144	Jaunpur	Gomti	Uttar Pradesh	6927	6813	6617	5833	4587	4433	IBHS	IBHS	IBHS
145	Jawahar Bridge, Agra	Yamuna	Uttar Pradesh	414000	147867	338000	293333	327500	333333	IBHS	D	IBHS
146	Jhalawad	Kalisindh	Rajasthan	*	60700	*	*	36100	*	*	IBHS	*
147	Jhansi Mirjapur Highway Road Bridge	Betwa	Uttar Pradesh	4493	6213	3780	4264	4000	2800	IBHS	IBHS	IBHS
148	K M Vadi	Cauvery/ Lakshmanthirth	Karnataka	84667	319000	169750	704000	7669333	1196667	D	D	D

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149	K.T.(Satrapur)	Kanhan	Maharashtra	*	13917	16000	16000	13338	13917	*	IBHS	IBHS
150	Kabirganj	Sharda	Uttar Pradesh	*	*	*	*	1350	*	*	*	*
151	Kachlabridge	Ganga	Uttar Pradesh	*	*	*	1250	1550	1700	*	*	*
152	Kailash Mandir, Near Benpur Village	Yamuna	Uttar Pradesh	606000	196733	310000	338333	246667	408333	IBHS	D	D
153	Kalampur	Kaliyar	Kerala	*	*	*	*	960	1550	*	*	*
154	Kalanaur	Yamuna	Uttar Pradesh	63653	90933	36667	47786	29067	32167	IBHS	IBHS	IBHS
155	Kallooppara	Manimala	Kerala	*	*	*	*	635	1020	*	*	*
156	Kalpi	Yamuna	Uttar Pradesh	40427	15800	23800	73800	63300	6600	D	D	IBHS
157	Kamalapuram	Papagani	Andhra Pradesh	*	3150	*	*	330	*	*	NoHS	*
158	Kamalpur	Banas	Gujarat	*	18767	*	*	6475	*	*	IBHS	*
159	Kannauj	Kali	Uttar Pradesh	*	*	*	*	11000	9300	*	*	*
160	Kanpur	Ganga	Uttar Pradesh	*	*	*	9400	9400	9300	*	*	*
161	Karad	Krishna	Maharashtra	*	31750	*	*	44800	9000	*	D	*
162	Karathode	Kadalundi	Kerala	*	*	*	*	820	1450	*	*	*
163	Karnal	Yamuna	Haryana	114933	32867	135000	158857	26600	28167	D	IBHS	IBHS
164	Kasganj	Kali	Uttar Pradesh	*	*	*	*	17000	14000	*	*	*
165	Katri Umrauli	Ganga	Uttar Pradesh	*	*	*	*	9300	6800	*	*	*
166	Kazipura	Ramganga	Uttar Pradesh	*	*	*	*	20000	*	*	*	*
167	Keesara	Munneru	Andhra Pradesh	2000	2015	4025	*	8580	5400	*	D	D
168	Kellodu	VEDAVATHI	Karnataka	*	*	*	1600000	708778	623333	*	*	*
169	Keolari	Wainganga	Madhya Pradesh	1035	3483	1972	1219	5366	6767	D	D	D
170	Khanpur	Mahi	Gujarat	7077	25753	13767	8713	8560	7867	D	D	IBHS
171	Khatoli	Parwati	Rajasthan	77000	101545	73500	44909	67091	65500	IBHS	D	IBHS
172	Khudrakhowa	Manas NH Xing	Assam	*	149	420	16000	560	47	*	NHS	NoHS
173	Kidangoor	Meenachil	Kerala	*	*	*	*	1733	1500	*	*	*

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174	Kodumudi	Cauvery	Tamil Nadu	7121	14893	6067	10107	14373	7917	D	IBHS	D
175	Koelwar	Sone	Bihar	*	*	*	*	3100	2300	*	*	*
176	Koggedoddi	Arkavathy	Karnataka	202480	440067	32160	1411933	6294667	177333	D	D	D
177	Kokiwada	Pench	Madhya Pradesh	3424	5222	6417	2854	3800	908	IBHS	IBHS	IBHS
178	Kollegal	Cauvery	Karnataka	225071	322533	14500	220375	448500	252000	IBHS	D	D
179	Konta	Sabari	Chhattisgarh	2167	2526	1427	1853	5514	8060	IBHS	D	D
180	Kopergaon	Godavari	Maharashtra	*	2750	*	*	8822	*	*	D	*
181	Kora	Rind	Uttar Pradesh	3332	3159	2500	4432	4057	3500	D	D	D
182	Kota-By Pass Hanging Road Bridge U/S of Kota City	Chambal	Rajasthan	*	20250	*	*	75333	*	*	D	*
183	Kudalaiyathur	Vellar	Tamil Nadu	1950	*	-	*	*	-	*	*	NoHS
184	Kudige	Cauvery	Karnataka	75640	254667	62200	451333	4720000	1070000	D	D	D
185	Kudlur	Palar	Tamil Nadu	*	*	*	*	16500	2700	*	*	*
186	Kuldahbridge	Sone	Madhya Pradesh	5660	6053	3750	3440	1893	2133	IBHS	IBHS	IBHS
187	Kulsi	Kulsi	Assam	42	681	1077	1300	1798	120	NHS	D	NoHS
188	Kumarapalayam	Varahanadhi	Puducherry	*	*	805	785	*	890	*	*	D
189	Kumbidi	Bharatapuzha	Kerala	*	*	*	*	620	1020	*	*	*
190	Kumhari	Wainganga	Madhya Pradesh	-	3041	538	-	3938	3137	NoHS	D	D
191	Kuniyil	Chaliyar	Kerala	*	*	*	*	810	1550	*	*	*
192	Kuppelur	Kumudavathi	Karnataka	*	249000	*	*	409000	465333	*	D	*
193	Kurundwad	Krishna	Maharashtra	*	15417	*	*	21143	17000	*	D	*
194	Kuttiyadi	Kuttiyadi	Kerala	*	*	*	*	1500	1950	*	*	*
195	Kuzhithurai	Thamarabarani	Tamil Nadu	*	*	*	*	2000	2450	*	*	*
196	Lakhisarai	Kiul	Bihar	*	*	*	*	3933	450	*	*	*
197	Lakkavalli	Bhadra	Karnataka	95680	218667	20440	182867	272667	555333	D	D	D
198	Lakshmanapatti	Kodaganar	Tamil Nadu	26583	24433	18733	8950	22225	8783	IBHS	IBHS	IBHS

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
199	Lalganj	Gandak	Bihar	*	*	*	*	2900	1700	*	*	*
200	Lalpur	Sengar	Uttar Pradesh	4689	13720	3035	7082	12680	3717	D	IBHS	D
201	Lodhikheda	Jam	Madhya Pradesh	8564	3335	11967	7013	5946	5988	IBHS	D	IBHS
202	Lucknow	Gomti	Uttar Pradesh	*	*	*	77667	55500	70000	*	*	*
203	Luwara	Shetrunji	Gujarat	22377	23133	16400	11811	7064	6550	IBHS	IBHS	IBHS
204	M H Halli	Hemavati	Karnataka	103667	170500	45160	236286	430333	114667	D	D	D
205	Madamon	Pampa	Kerala	*	*	*	*	1280	1550	*	*	*
206	Madhira	Wyra	Telangana	2152	1792	1820	2200	7660	11467	D	D	D
207	Madla	Ken	Madhya Pradesh	*	2362	2850	*	3680	4300	*	D	D
208	Magaral	Cheyyar	Tamil Nadu	2800	-	1298	1550	-	1400	IBHS	NoHS	D
209	Magardhara	Wainganga	Madhya Pradesh	2135	4647	477	446	3614	4100	NoHS	IBHS	NHS
210	Mahalgaon	Wainganga	Maharashtra	2619	2343	2818	1980	3281	1165	IBHS	D	IBHS
211	Mahidpur	Shipra	Madhya Pradesh	*	168250	*	*	164500	*	*	IBHS	*
212	Maighat	Gomti	Uttar Pradesh	6047	7173	5417	4713	4093	4767	IBHS	IBHS	IBHS
213	Malakkara	Pampa	Kerala	*	*	*	*	993	1450	*	*	*
214	Malkhed	Kangna	Karnataka	3055	2193	1427	1857	6392	10517	IBHS	D	D
215	Manakkad	Thodupuzha	Kerala	*	*	*	*	787	1300	*	*	*
216	Manas NH Xing	Manas NH Xing	Assam	*	223	203	9000	1740	883	*	NHS	NHS
217	Mancherial	Godavari	Telangana	2006	1961	2910	1834	5536	9200	IBHS	D	D
218	Mandawara	Chambal	Rajasthan	118467	85800	100333	63071	50400	80333	IBHS	IBHS	IBHS
219	Manderial	Chambal	Rajasthan	56067	87267	70833	55929	49400	60500	IBHS	IBHS	IBHS
220	Mangaon	Kal	Maharashtra	*	20417	*	*	21646	8000	*	D	*
221	Manjhi	Ghaghra	Bihar	*	*	*	*	4750	1700	*	*	*
222	Mankara	Bharatapuzha	Kerala	*	*	*	*	1900	2300	*	*	*
223	Mantralayam	Tungabhadra	Andhra Pradesh	1791	1820	1058	*	7492	8117	*	D	D

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
224	Marella	Gundlakamma	Andhra Pradesh	1958	2800	1320	*	9500	5400	*	D	D
225	Marol	Varada	Karnataka	*	172200	*	*	1108333	793333	*	D	*
226	Mataji	Mahi	Madhya Pradesh	27636	20567	18500	7950	8033	6350	IBHS	IBHS	IBHS
227	Mawi	Yamuna	Uttar Pradesh	907267	784667	775000	910000	231200	35000	D	IBHS	IBHS
228	Mehandipur	Ganga	Uttar Pradesh	*	*	*	*	10150	*	*	*	*
229	Mejaroad	Tons	Uttar Pradesh	4107	4107	3800	2700	2340	2317	IBHS	IBHS	IBHS
230	Menangudi	Noolar	Tamil Nadu	*	2083	502	940	287	318	*	NoHS	NoHS
231	Mirzapur	Ganga	Uttar Pradesh	7093	8013	7067	5067	4140	3967	IBHS	IBHS	IBHS
232	Mohana	Betwa	Uttar Pradesh	15596	16407	7440	4173	4378	33567	IBHS	IBHS	D
233	Mohna	Yamuna	Haryana	5313333	2258667	10550000	16942143	4098667	1733333	D	D	IBHS
234	Moradabad	Ramganga	Uttar Pradesh	*	*	*	*	17000	14000	*	*	*
235	Mungoli	Penganga	Maharashtra	2115	965	1633	2283	3196	7362	D	D	D
236	Munugodu	Edduvagu	Andhra Pradesh	1906	1821	2250	1320	5744	6983	IBHS	D	D
237	Muradpur	Vashishti	Maharashtra	*	46182	*	*	78462	*	*	D	*
238	Murappanadu	Tambraparani	Tamil Nadu	8486	7050	6483	6853	7600	6467	IBHS	D	IBHS
239	Musiri	Cauvery	Tamil Nadu	10269	16440	7167	7873	6080	9517	IBHS	IBHS	D
240	Muthankera	Kabini	Kerala	99953	528733	55400	477800	6033333	159667	D	D	D
241	Nagothane	Amba	Maharashtra	*	19383	*	*	39877	*	*	D	*
242	Naidupet	Swarnamukhi	Andhra Pradesh	10900	5324	383	1400	365	860	IBHS	NoHS	D
243	Nallamaranpatty	Amaravathi	Tamil Nadu	7933	4850	4900	8433	11125	9533	D	D	D
244	Nallathur	Nandalar	Puducherry	*	*	1140	1010	330	770	*	*	IBHS
245	Nanded	Godavari	Maharashtra	2100	4213	1407	1771	4540	14233	IBHS	D	D
246	Nandgaon	Wunna	Maharashtra	5257	3950	7183	5067	6795	4283	IBHS	D	IBHS
247	Nandipalli	Sagileru	Andhra Pradesh	222	1766	1765	1180	1400	1500	NHS	IBHS	IBHS
248	Nasik	Godavari	Maharashtra	2800	1967	3517	2613	6400	14867	IBHS	D	D

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
249	Naugaon	Yamuna	Uttarakhand	11213	61733	21833	23571	28533	22500	D	IBHS	D
250	Neeleswaram	Periyar	Kerala	*	*	*	*	1147	1300	*	*	*
251	Neemsar	Gomti	Uttar Pradesh	*	*	*	2400	2133	*	*	*	*
252	Nellipally	Kallada	Kerala	*	*	*	*	860	1300	*	*	*
253	Nellithurai	Bhavani	Tamil Nadu	3800	*	*	*	*	*	*	*	*
254	Nellore	Pennar	Andhra Pradesh	700	1947	5650	*	865	1723	*	IBHS	IBHS
255	Noida	Yamuna	Uttar Pradesh	60533333	15466667	10366667	26000000	4620000	3166667	D	IBHS	IBHS
256	Nona	Nona	Assam	*	1286	1810	800	360	1592	*	NoHS	IBHS
257	Nowrangpur	Indravathi	Odisha	2322	2060	1960	2343	4380	8750	D	D	D
258	Odenthurai	Kallar	Tamil Nadu	53073	16164	15733	17063	16573	12150	IBHS	D	IBHS
259	Orai Rath marg Road Bridge, Chikasi	Betwa	Uttar Pradesh	15207	14627	7760	5473	4044	10683	IBHS	IBHS	D
260	P.G.Bridge	Penganga	Maharashtra	996	2970	1072	968	5323	8182	IBHS	D	D
261	Pachawali	Sindh	Madhya Pradesh	*	3214	*	*	3280	*	*	D	*
262	Pachegaon	Pravara	Maharashtra	2433	1963	2567	*	5750	*	*	IBHS	*
263	Padardibadi	Mahi	Rajasthan	33038	13400	24833	11493	8800	6300	IBHS	IBHS	IBHS
264	Pagladiya	Pagladiya	Assam	*	220	1870	*	3070	43	*	NHS	NoHS
265	Palakkadavu	Karuvannur	Kerala	*	*	*	*	1230	1070	*	*	*
266	Paleru Bridge	Paleru	Andhra Pradesh	1764	2245	1176	*	8570	13733	*	D	D
267	Pali	Chambal	Rajasthan	82600	62533	57667	48143	41867	40833	IBHS	IBHS	IBHS
268	Paliakalan	Sharda	Uttar Pradesh	*	*	*	*	2250	*	*	*	*
269	Palla	Yamuna	Delhi	1813333	672000	2068000	885000	924000	523333	IBHS	D	IBHS
270	Pancharatna	Brahmaputra	Assam	*	279	600	2400	517	27	*	NHS	NoHS
271	Paramkudi	Vaigai	Tamil Nadu	12971	*	41333	2800	4900	9383	IBHS	*	IBHS
272	Pargaon	Bhima	Maharashtra	*	46083	*	*	26286	*	*	D	*
273	Parmat ghat	Ganga	Uttar Pradesh	*	*	*	7000	8150	7800	*	*	*

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
274	Parsohan ghat	Burhi Rapti	Uttar Pradesh	*	*	*	2200	2600	2600	*	*	*
275	Patala	Wardha	Maharashtra	2375	4221	5877	5658	6950	3438	D	D	IBHS
276	Patansaongi	Chandrabhaga	Maharashtra	6908	5169	1967	3540	6442	5520	IBHS	D	D
277	Pathagudem	Indravathi	Chhattisgarh	2321	2469	2960	1460	4773	7617	IBHS	D	D
278	Pattazhy	Kallada	Kerala	*	*	*	*	947	1170	*	*	*
279	Pauni	Wainganga	Maharashtra	5107	3887	2700	2887	7238	8388	IBHS	D	D
280	Peralam	Vanjiyar	Tamil Nadu	*	11445	3580	315	254	760	*	NoHS	IBHS
281	Perumannu	Valapatnam	Kerala	*	*	*	*	943	1020	*	*	*
282	Perur	Godavari	Telangana	2193	2140	3117	1708	3759	8117	IBHS	D	D
283	Phulgaon	Bhima	Maharashtra	*	55333	*	*	12167	*	*	IBHS	*
284	Poanta	Yamuna	Himachal Pradesh	209720	139933	24667	27357	40267	46667	IBHS	IBHS	D
285	Poiyaghat, Agra	Yamuna	Uttar Pradesh	555333	173067	262000	330833	353333	445000	IBHS	D	D
286	Polavaram	Godavari	Andhra Pradesh	2145	3300	2257	1733	5264	5283	IBHS	D	D
287	Porakudi	Arasalar	Tamil Nadu	*	2526	-	350	213	-	*	NoHS	NoHS
288	Pratap pur	Yamuna	Uttar Pradesh	6446	5773	3572	7733	7233	6567	D	D	D
289	Pratapgarh	Sai	Uttar Pradesh	7267	6347	3683	4047	3100	3367	IBHS	IBHS	IBHS
290	Pratappur	Pravara	Maharashtra	2250	3891	1400	2800	7067	9200	D	D	D
291	Pudur	Kannadipuzha	Kerala	*	*	*	*	1233	1450	*	*	*
292	Pulamanthole	Pulanthodu	Kerala	*	*	*	*	865	1550	*	*	*
293	Pulikukku	Kumaradhara	Karnataka	*	*	*	*	1280	1800	*	*	*
294	Purna	Purna	Maharashtra	*	2264	1833	3500	5908	11467	*	D	D
295	Puthimari	Puthimari	Assam	*	345	3507	330	2557	113	*	NHS	NoHS
296	Rahu (Mirawadi)	Mula-Mutha	Maharashtra	*	75250	*	*	26429	*	*	IBHS	*
297	Rai Bareli	Sai	Uttar Pradesh	*	*	*	2100	3350	3400	*	*	*
298	Rajahmundry	Godavari	Andhra Pradesh	*	*	*	1533	5850	9200	*	*	*

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										Pre-M	M	Post- M
299	Rajapur	Yamuna	Uttar Pradesh	9973	8333	7080	8583	10856	7667	IBHS	D	D
300	Rajegaon	Pranhita	Madhya Pradesh	945	3092	672	1246	6000	2070	IBHS	D	D
301	Rajghat (Agra)	Betwa	Uttar Pradesh	2683	2123	2560	4545	4660	3133	D	D	D
302	Ramakona	Kanhan	Madhya Pradesh	5391	7927	5700	637	7258	3383	IBHS	IBHS	IBHS
303	Ramamangalam	Muvattupuzha	Kerala	*	*	*	*	740	1150	*	*	*
304	Rangeli	Som	Rajasthan	15992	26393	16267	9613	7500	6800	IBHS	IBHS	IBHS
305	Regauli	Rapti	Uttar Pradesh	*	*	*	5400	4850	4600	*	*	*
306	Renukaji	Giri	Himachal Pradesh	9680	31000	16167	18500	27867	25667	D	IBHS	D
307	Sahijana	Betwa	Uttar Pradesh	4747	3703	3020	4564	3389	8233	IBHS	IBHS	D
308	Saidpur	Ganga	Uttar Pradesh	6913	7353	4583	6193	4507	4500	IBHS	IBHS	IBHS
309	Saigaon	Manjira	Karnataka	*	2625	*	*	7409	9200	*	D	*
310	Sakhara	Wainganga	Maharashtra	3661	3772	2567	5597	5833	4850	D	D	D
311	Sakleshpura	Hemavati	Karnataka	51127	362800	362600	300909	401333	623333	D	D	D
312	Sakmur	Wardha	Maharashtra	2519	4388	2222	517	4098	1768	IBHS	IBHS	IBHS
313	Salebardi	Wainganga	Maharashtra	*	4302	668	4088	3280	2848	*	IBHS	D
314	Saloora	Manjira	Telangana	2053	2113	1900	1450	6500	7933	IBHS	D	D
315	Samdoli	Warna	Maharashtra	*	32143	*	*	14500	14500	*	IBHS	*
316	Sangam(LGD)	Kinnerasani	Telangana	1893	1727	2167	1853	4247	7520	IBHS	D	D
317	Sangod	Parwan	Rajasthan	*	76500	*	*	36889	*	*	IBHS	*
318	Santhegulli	Aghnanashni	Karnataka	*	*	*	*	907	1700	*	*	*
319	Saradaput	Sabari	Odisha	1985	1926	1780	1627	5680	5283	IBHS	D	D
320	Sarangpur	Kalisindh	Madhya Pradesh	*	103800	*	*	122000	*	*	D	*
321	Sarati	Nira	Maharashtra	*	*	*	*	7122	*	*	*	*
322	Satna	Tons	Madhya Pradesh	6213	4627	5050	3400	1901	1817	IBHS	IBHS	IBHS
323	Satrapur	Kanhan	Maharashtra	7480	5353	2433	3920	10985	9100	IBHS	D	D

S. No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
324	Savandapur	Bhavani	Tamil Nadu	17893	14260	4283	5407	9547	9633	IBHS	IBHS	D
325	Seohara	Ramganga	Uttar Pradesh	*	*	*	*	21500	17000	*	*	*
326	Seondha	Sindh	Madhya Pradesh	2032	2693	3060	4149	4080	3067	D	D	D
327	Sevanur	Chittar	Tamil Nadu	31467	*	7900	*	12980	23000	*	*	D
328	Shahjahanpur	Khannaut	Uttar Pradesh	*	*	*	*	24000	21000	*	*	*
329	Shahzadpur	Ganga	Uttar Pradesh	7027	8280	5950	4100	3660	3267	IBHS	IBHS	IBHS
330	Shastri Bridge	Ganga	Uttar Pradesh	7567	7933	6033	4800	3980	3750	IBHS	IBHS	IBHS
331	Shimoga	Tunga	Karnataka	68667	535909	780000	706667	918462	232000	D	D	IBHS
332	Singasadanapalli	Ponnaiyar	Tamil Nadu	1959867	2038667	4583333	5600000	8666667	2383333	D	IBHS	IBHS
333	Singavaram	Chitravathi	Andhra Pradesh	*	2567	-	*	1400	*	*	IBHS	*
334	Sitapur	sarayan	Uttar Pradesh	*	*	*	1700	1300	*	*	*	*
335	Sonapur	Digaru	Assam	-	970	2713	*	2607	113	*	D	NoHS
336	Sripalpur	Punpun	Bihar	*	*	*	*	3300	1850	*	*	*
337	Suddakallu	Dindi	Telangana	1759	2820	1567	1319	11271	8750	IBHS	D	D
338	Sultanpur	Gomti	Uttar Pradesh	6607	6227	7300	6567	4840	4333	IBHS	IBHS	IBHS
339	Sulurpet	Kalingi	Andhra Pradesh	8563	*	420	390	1015	1860	NoHS	*	NHS
340	T Bekuppe	Arkavathy	Karnataka	489667	661200	358000	1310000	3578000	793333	D	D	D
341	T K Halli	Shimsha	Karnataka	329700	584091	132500	*	933333	623333	*	D	D
342	T Narsipura	Kabini	Karnataka	64827	374400	74200	273733	495333	188667	D	D	D
343	T.Ramapuram	Hagari	Karnataka	2485	3625	1657	1700	5173	7183	IBHS	D	D
344	Tadipatri	Pennar	Andhra Pradesh	7880	6220	*	*	3400	*	*	IBHS	*
345	Takali	Bhima	Maharashtra	*	*	*	*	10000	*	*	*	*
346	Tal	Chambal	Madhya Pradesh	*	113333	*	*	97250	*	*	IBHS	*
347	Tandalaiputhur	Ayyar	Tamil Nadu	63667	*	*	*	*	9933	*	*	*
348	Terwad	Panchganga	Maharashtra	*	18525	*	*	34643	17500	*	D	*

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										Pre-M	M	Post- M
349	Thandalaiputhur	Ayyar	Tamil Nadu	*	*	*	*	*	9933	*	*	*
350	Thengudi	Thirumalairajanar	Tamil Nadu	5647	2768	2998	560	1433	1573	IBHS	IBHS	IBHS
351	Thengumarahada	Bhavani / Moyar	Tamil Nadu	16813	6012	3233	5280	18853	6333	IBHS	D	D
352	Theni	Vagai/Suruliar	Tamil Nadu	20747	14173	8683	7800	6260	10667	IBHS	IBHS	D
353	Thevur	Sarabenga	Tamil Nadu	10843	6400	39333	24500	31571	23750	D	D	IBHS
354	Thimmanahalli	Yagachi	Karnataka	140000	414000	237400	555444	588000	200000	D	D	IBHS
355	Thoppur	Thoppaiyar	Tamil Nadu	31000	*	*	*	*	21967	*	*	*
356	Thottathinkadavu	Iruvazhinjipuzha	Kerala	*	*	*	*	1147	1450	*	*	*
357	Thumpamon	Achankovil	Kerala	*	*	*	*	960	1020	*	*	*
358	Tiharkhera	Ramganga	Uttar Pradesh	*	*	*	*	23000	24000	*	*	*
359	Tondarpur	Sukheta	Uttar Pradesh	*	*	*	*	17000	14000	*	*	*
360	Tonk	Banas	Rajasthan	*	154000	*	*	102818	*	*	IBHS	*
361	Tuini	Tons	Uttarakhand	32420	27733	13617	23429	27733	23000	IBHS	D	D
362	Turtipar	Ghaghra	Uttar Pradesh	*	*	*	16500	11000	13000	*	*	*
363	U/S (Bamni)	Wardha	Maharashtra	*	9852	4183	7287	9931	7328	*	D	D
364	U/S (Satrapur)	Kanhan	Maharashtra	*	10833	8683	12420	9846	13667	*	IBHS	D
365	Udi	Chambal	Uttar Pradesh	7100	8300	9180	13917	4667	5750	D	IBHS	IBHS
366	Ujjain	Shipra	Madhya Pradesh	*	931083	1700000	*	376083	490000	*	IBHS	IBHS
367	Urachikottai	Cauvery	Tamil Nadu	4025	9592	*	7450	6064	6417	D	IBHS	*
368	V S Bridge	Ganga	Uttar Pradesh	7320	7860	5533	5473	4567	3817	IBHS	IBHS	IBHS
369	Vandiperiyar	Periyar	Kerala	*	*	*	*	913	1070	*	*	*
370	Varanasi	Ganga	Uttar Pradesh	7427	8067	6267	5660	4840	4850	IBHS	IBHS	IBHS
371	Varanavasi	Maruthaiyar	Tamil Nadu	7950	4700	7900	4900	*	11075	IBHS	*	D
372	Vautha	Sabarmati	Gujarat	995385	852000	280000	286000	192667	215000	IBHS	IBHS	IBHS
373	Vazhavachanur	Ponnaiyar	Tamil Nadu	-	1213	257	-	203	2380	NoHS	NoHS	NHS

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										Pre-M	M	Post- M
374	Veligonda	Musi	Telangana	5815	4023	2875	2200	6954	16000	IBHS	D	D
375	Vijayawada	Krishna	Andhra Pradesh	2096	1801	1833	1956	6121	6983	IBHS	D	D
376	Villupuram	Ponnaiyar	Tamil Nadu	*	6315	2175	1700	*	1733	*	*	IBHS
377	Vrindawan Bridge (Mathura U/S)	Yamuna	Uttar Pradesh	2402857	1143333	1058333	1593571	698000	273333	IBHS	IBHS	IBHS
378	Wadakbal	Sina	Maharashtra	*	125000	*	*	93909	50000	*	IBHS	*
379	Wadenapally	Krishna	Telangana	1866	2433	1640	1411	4850	13733	IBHS	D	D
380	Wairagarh	Khobragadi	Maharashtra	800	5650	957	300	2827	4672	NoHS	IBHS	D
381	Warunji	Koyna	Maharashtra	*	50000	*	*	17444	5000	*	IBHS	*
382	Watrak Nr Vautha	Watrak	Gujarat	140000	27750	17667	*	7625	*	*	IBHS	*
383	Yadgir	Bhima	Karnataka	*	1950	1400	*	5869	9200	*	D	D
384	Yamuna Expessway Road Bridge, Etamadpur	Yamuna	Uttar Pradesh	652667	225533	364000	330000	941111	200833	IBHS	D	IBHS
385	Yashwant Nagar	Giri	Himachal Pradesh	12967	54786	19500	38143	37000	34000	D	IBHS	D
386	Yelli	Godavari	Maharashtra	2421	3380	2400	2207	5107	9200	IBHS	D	D
387	Yennehole	Swarna	Karnataka	*	*	*	*	740	1250	*	*	*

(-) means No Hotspot

(*) means Data not available/ river dry.

No Hot Spot (NoHS)

Deteriorate (D)

New Hotspot (NHS)

Improved but Hotspot (IBHS)

8.11 Faecal Coliform (FC):

During pre-monsoon season, 201 water quality monitoring stations across 18 states- Maharashtra, Assam, Uttar Pradesh, Karnataka, Tamil Nadu, Rajasthan, Madhya Pradesh, Andhra Pradesh, Telangana, Chhattisgarh, Delhi, Gujarat, Bihar, Himachal Pradesh, Uttarakhand, Haryana, Kerala and Odisha reported average FC values exceeding 500 MPN/100 ml during 2024 as compared to 2023 where 184 water quality monitoring staions on 90 Rivers across the 16 staes in India- Uttar Pradesh, Karnataka, Rajasthan, Tamil Nadu, "Maharashtra, Madhya Pradesh, Andhra Pradesh, Telangana, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Uttarakhand, Haryana, Kerala and Odisha exceeding 500 MPN/100 ml FC.

In the monsoon season, 310 water quality monitoring stations across 19 states- Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Karnataka, Tamil Nadu, Bihar, Andhra Pradesh, Telangana, Assam, Chhattisgarh, Gujarat, Haryana, Delhi, Himachal Pradesh, Jharkhand, Uttarakhand, Kerala and Odisha displayed similar findings during 2024 as compared to 2023 where 238 water quality monitoring staions on 111 Rivers across the 17 staes in India- Madhya Pradesh, Maharashtra,Rajasthan, Assam, Uttar Pradesh, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Chhattisgarh, Gujarat, Delhi, Himachal Pradesh, Uttarakhand, Haryana, Kerala and Odisha exceeding 500 MPN/100 ml FC.

Finally, in the post-monsoon season, 261 water quality monitoring stations in 19 states- Maharashtra, Rajasthan, Uttar Pradesh, Karnataka, Tamil Nadu, Bihar, Madhya Pradesh, Uttarakhand, Andhra Pradesh, Telangana, Assam, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Jharkhand, Haryana, Kerala and Odisha recorded average FC values exceeding 500 MPN/100 ml during 2024 as compared to 2023 where 181 water quality monitoring staions on 91 Rivers across the 17 staes in India- Tamil Nadu, Maharashtra, Rajasthan, Assam, Uttar Pradesh, Karnataka, Andhra Pradesh, Telangana, Madhya Pradesh, Chhattisgarh, Gujarat, Delhi, Himachal Pradesh, Uttarakhand, Haryana, Kerala and Odisha exceeding 500 MPN/100 ml FC.

Several monitoring stations showed improvement while other demostrated detoriation in water quality from 2023 to 2024. 5 monitoring stations on 5 rivers experienced tremendous improvement to No-Hotspots in 2024 as compared to 2023 such as Biligundulu (Cauvery River) during all seasons. 39 monitoring stations on 18 rivers like Baghpat (Yamuna River) demonstrated improvement but Hotspot throughout all seasons. Conversely, 13 monitoring stations on 12 rivers like Mohna (Yamuna River) experienced deterioration in water quality in all seasons. No monitoring stations emerged as New Hotspots in all seasons.

During pre-monsoon season, 20 monitoring stations on 16 rivers like Nellore (Pennar River) demonstrated No-Hotspots in 2024 as compared to 2023. 96 monitoring stations on 53 rivers like Baghpat (Yamuna River) showed signs of improvement but still Hotspot. 56 monitoring stations on 33 rivers like

Asthi (Wainganga River) deteriorated in water quality indicating persistent environmental challenges and potential anthropogenic influences exacerbating water pollution while 5 monitoring stations on 5 rivers like Rajegaon (Pranhita River) emerged as New Hotspots.

During monsoon season, 11 monitoring stations on 11 rivers like Biligundulu (Cauvery River) showed No-Hotspots in 2024 as compared to 2023. 109 monitoring stations on 60 rivers like Ujjain (Shipra River) showed signs of improvement but still Hotspot. 123 monitoring stations on 66 rivers like Ganguwala (Yamuna River) deteriorated in water quality while 8 monitoring stations on 6 rivers like Mahalgaon (Wainganga River) emerged as New Hotspots.

During post-monsoon season, 20 monitoring stations on 17 rivers like Patala (Wardha River) showed No-Hotspots in 2024 as compared to 2023. 99 monitoring stations on 51 rivers like Allahabad (Ganga River) showed signs of improvement but still Hotspot. 71 monitoring stations on 45 rivers like Perur (Godavari River) deteriorated in water quality while 20 monitoring stations on 16 rivers like Rajegaon (Pranhita River) emerged as New Hotspots.

Table 29: Comparison of Hot Spots Faecal Coliform (FC) during year 2023 with 2024

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
1	A.B.Road Crossing	Parwati	Madhya Pradesh	*	18000	*	*	35900	*	*	D	*
2	A.P. Puram	Chittar	Tamil Nadu	*	*	1100	615	*	680	*	*	IBHS
3	A.P.M.(Ashti)	Wainganga	Maharashtra	*	5056	3583	3832	1869	1937	*	IBHS	IBHS
4	Abu Road	Banas	Rajasthan	*	6262	5300	*	3363	3950	*	IBHS	IBHS
5	Aie NH Xing	Aie	Assam	*	732	700	3000	268	210	*	NoHS	NoHS
6	Akbarpur	Chhoti sarju	Uttar Pradesh	4060	4100	2633	2672	1713	2067	IBHS	IBHS	IBHS
7	Akkihebbal	Hemavati	Karnataka	24560	39953	11760	15093	13953	3450	IBHS	IBHS	IBHS
8	Aklera	Parwan	Rajasthan	9300	17789	*	*	7120	*	*	IBHS	*
9	Alanthurai	Noyyal	Tamil Nadu	1100	2500	*	*	946	*	*	IBHS	*
10	Allahabad	Ganga	Uttar Pradesh	3987	4220	3400	2833	2187	2317	IBHS	IBHS	IBHS
11	Ambarampalayam	Bharathapuzha	Tamil Nadu	827	853	932	2839	1111	1463	D	D	D
12	Ambasamudram	Vaigai	Tamil Nadu	1693	*	518	877	1900	728	D	*	D
12	Ankinghat	Ganga	Uttar Pradesh	*	*	*	1700	1700	1300	*	*	*
13	Arjunwad	Krishna	Maharashtra	*	7414	*	*	7857	6050	*	D	*
15	Arnota	Uttangan	Uttar Pradesh	*	*	*	*	3400	*	*	*	*
14	Asthi	Wainganga	Maharashtra	989	1682	843	1158	1156	1237	D	IBHS	D
15	Auraiya	Yamuna	Uttar Pradesh	61193	39953	39420	91809	108778	6235	D	D	IBHS
16	Avarankuppam	Palar	Tamil Nadu	1300	780	*	*	940	3050	*	D	*
19	Ayodhya	Ghaghra	Uttar Pradesh	*	*	*	1300	1400	*	*	*	*
20	Azamabad	Ganga	Bihar	*	*	*	373	1718	1500	*	*	*
17	B.P.M. (Bamni)	Wardha	Maharashtra	*	4231	6517	8000	6343	3428	*	D	IBHS
18	Badlapur	Ulhas	Maharashtra	14707	33133	5283	20467	30533	16500	D	IBHS	D
19	Baghpat	Yamuna	Uttar Pradesh	81320	22373	23833	29286	20667	8567	IBHS	IBHS	IBHS
20	Bakhari	Wainganga	Madhya Pradesh	1840	783	487	185	1184	1072	NoHS	D	D
21	Baleni	Yamuna	Uttar Pradesh	216000	165733	193333	364286	78267	489667	D	IBHS	D
26	Balrampur	Rapti	Uttar Pradesh	*	*	*	940	1250	1400	*	*	*
22	Baluaghat	Ganga	Uttar Pradesh	3840	3973	3333	3400	2787	2833	IBHS	IBHS	IBHS
23	Bamni(Nagpur)	Wardha	Maharashtra	1797	1448	912	675	2136	3277	IBHS	D	D
24	Banda	Ken	Uttar Pradesh	994	4157	1222	3208	2600	1870	D	IBHS	D
30	Bangapani	Gauri Ganga	Uttarakhand	*	*	*	220	355	680	*	*	*
31	Banjari	Sone	Bihar	*	*	*	*	3500	2200	*	*	*
32	Banka	Chandan	Bihar	*	*	*	*	1083	775	*	*	*
33	Bansi	Rapti	Uttar Pradesh	*	*	*	700	940	920	*	*	*
25	Baranwada	Banas	Rajasthan	*	13733	*	*	16482	11100	*	D	*

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
35	Bareilly	Ramganga	Uttar Pradesh	*	*	*	*	13000	14000	*	*	*
26	Barod	Kalisindh	Rajasthan	38242	8255	22383	10255	14260	16000	IBHS	D	IBHS
37	Basantpur (Ganga)	Ganga	Uttar Pradesh	*	*	*	*	1900	2700	*	*	*
27	Basoda	Betwa	Madhya Pradesh	2373	2435	*	3093	2233	1783	D	IBHS	*
39	Basti	Kwano	Uttar Pradesh	*	*	*	*	1100	*	*	*	*
40	Basti D/S	Kwano	Uttar Pradesh	*	*	*	*	4500	*	*	*	*
41	Basti U/S	Kwano	Uttar Pradesh	*	*	*	*	1100	*	*	*	*
28	Bawapuram	Tungabhadra	Andhra Pradesh	1651	985	570	1100	3471	6450	IBHS	D	D
43	Beki Road Bridge	Beki	Assam	*	92	153	3500	440	80	*	NoHS	NoHS
29	Belne Bridge	Gad	Maharashtra	4392	65800	6120	9690	12650	4350	D	IBHS	IBHS
30	Bendrahalli	Suvarnavathi	Karnataka	75860	100453	50200	206667	21780	13780	D	IBHS	IBHS
31	Bhadana Village D/s of Kota City	Chambal/Parwati	Rajasthan	*	15950	*	*	14429	*	*	IBHS	*
32	Bhadrachelam	Godavari	Telangana	1213	915	762	1127	3179	4500	IBHS	D	D
33	Bhatpalli	Peddavagu	Telangana	1053	1275	1090	571	1857	1650	IBHS	D	D
34	Bhind	Kunwari	Madhya Pradesh	9144	16417	2700	3133	2943	3200	IBHS	IBHS	D
50	Bhitaura	Ganga	Uttar Pradesh	*	*	*	4600	*	4500	*	*	*
35	Bigod	Banas	Rajasthan	8467	35067	*	*	8880	10060	*	IBHS	*
36	Biligundulu	Cauvery	Tamil Nadu	-	707	668	-	200	480	NoHS	NoHS	NoHS
52	Birdghat	Rapti	Uttar Pradesh	*	*	*	2600	8000	*	*	*	*
53	Bithoor	Ganga	Uttar Pradesh	*	*	*	2200	3600	3100	*	*	*
54	Buxar	Ganga	Bihar	*	*	*	300	1515	1717	*	*	*
37	Byladahalli	Haridra	Karnataka	*	43288	5525	*	31040	4130	*	IBHS	IBHS
38	Chaklagaon	Manas	Assam	*	-	613	3400	-	97	*	NoHS	NoHS
57	Chandrika Devi	Gomti	Uttar Pradesh	*	*	*	2300	1700	3400	*	*	*
39	Changsari	Kurijali	Assam	*	543	647	340	1097	1822	*	D	D
40	Chengalpet	Palar	Tamil Nadu	-	808	-	-	282	-	NoHS	NoHS	NoHS
41	Chindnar	Indravathi	Chhattisgarh	1176	1360	548	1314	2839	3367	D	D	D
42	Chitrasani	Balaram	Gujarat	*	7015	2700	*	3233	*	*	IBHS	*
61	Chittorgarh	Gambhiri	Rajasthan	*	*	*	*	26000	*	*	*	*
43	Cholachagudda	Malaprabha	Karnataka	6686	35556	*	*	641143	34000	*	D	*
44	Chopan	Sone	Uttar Pradesh	2653	2287	1700	1202	561	643	IBHS	IBHS	IBHS
45	Chunchunkatte	Cauvery	Karnataka	2600	49330	*	39650	10980	3350	D	IBHS	*
46	D/S (Ashti)	Wainganga	Maharashtra	*	2894	2350	2300	1622	1180	*	IBHS	IBHS
66	Dabri	Ramganga	Uttar Pradesh	*	*	*	*	7800	14000	*	*	*
67	Dadri	Sahibi	Haryana	*	*	*	*	17500	*	*	*	*

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
47	Dameracherla	Musi	Telangana	1317	1378	705	790	4833	9067	IBHS	D	D
48	Daund	Bhima	Maharashtra	*	15333	*	*	21143	*	*	D	*
49	Delhi Railway Bridge	Yamuna	Delhi	21038000	11869333	4100000	5557143	1494000	1346667	IBHS	IBHS	IBHS
50	Deongaon Bridge	Bhima	Karnataka	*	1733	*	*	3388	9750	*	D	*
51	Deosugar	Krishna	Karnataka	2001	1199	580	1100	2993	5800	IBHS	D	D
52	Derol Bridge	Sabarmati	Gujarat	5100	3718	4900	3390	3278	3033	IBHS	IBHS	IBHS
53	Dhalegaon	Godavari	Maharashtra	*	997	652	368	3603	5083	*	D	D
75	Dhaneta	Baigul/Kicha	Uttar Pradesh	*	*	*	*	7800	11000	*	*	*
54	Dhansa	Sahibi	Delhi	*	123000	*	*	120167	*	*	IBHS	*
55	Dhareri	Chambal	Madhya Pradesh	*	292000	*	*	230000	*	*	IBHS	*
56	Dholpur	Chambal	Rajasthan	8746	9955	5860	6517	1964	2800	IBHS	IBHS	IBHS
79	Dobhi	Phalgu	Bihar	*	*	*	*	1990	2350	*	*	*
57	Duddhi	Kanhar	Uttar Pradesh	2873	1480	1400	963	695	867	IBHS	IBHS	IBHS
81	Dudhnoi	Dudhnai	Assam	*	362	270	300	1147	760	*	D	NHS
82	Elgin bridge	Ghaghra	Uttar Pradesh	*	*	*	630	940	*	*	*	*
58	Elunuthi Mangalam	Noyyal	Tamil Nadu	2091	733	1433	1451	2092	1700	IBHS	D	D
59	Etawah	Yamuna	Uttar Pradesh	426667	137267	556000	437500	88889	111500	D	IBHS	IBHS
85	Faizabad U/S	Ghaghra	Uttar Pradesh	*	*	*	*	1100	*	*	*	*
86	Fatehgarh	Ganga	Uttar Pradesh	*	*	*	1200	2150	*	*	*	*
60	Gaisabad	Bearma	Madhya Pradesh	2000	1859	1960	*	1900	1733	*	D	IBHS
61	Galeta	Hindon	Uttar Pradesh	6992667	1274667	9900000	4114286	420800	1130000	IBHS	IBHS	IBHS
62	Gandhavayal	Gandhayar	Tamil Nadu	2579	1402	572	770	1074	1400	IBHS	IBHS	D
91	Gandhighat	Ganga	Bihar	*	*	*	698	1779	1692	*	*	*
63	Gandlapet	Peddavagu	Telangana	1804	1009	607	652	4020	3150	IBHS	D	D
64	Ganguwala	Yamuna	Himachal Pradesh	6560	5907	9017	9779	9440	6983	D	D	IBHS
65	Ganod	Bhadar	Gujarat	*	5880	*	*	3500	2783	*	IBHS	*
66	Garhakota	Sonar	Madhya Pradesh	*	3685	*	*	9300	*	*	D	*
96	Garhmukteshwar	Ganga	Uttar Pradesh	*	*	*	530	670	680	*	*	*
97	Garhwa	North Koel	Jharkhand	*	*	*	*	1633	1500	*	*	*
67	Garrauli	Dhasan	Madhya Pradesh	1008	6944	3212	3275	1880	1487	D	IBHS	IBHS
99	Gaya	Phalgu	Bihar	*	*	*	*	1700	1250	*	*	*
68	Ghazipur	Ganga	Uttar Pradesh	3887	3973	2967	3367	2167	2767	IBHS	IBHS	IBHS
69	Gokak	Ghataprabha	Karnataka	*	41900	6800	36000	437507	8880	*	D	D
70	Gokul Barrage II Mathura D/S	Yamuna	Uttar Pradesh	874667	2006667	2730000	1964286	1306000	325000	D	IBHS	D
103	Gomti Nagar	Gomti	Uttar Pradesh	*	*	*	94000	59500	79000	*	*	*

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
104	Gorakhpur D/S	Rapti	Uttar Pradesh	*	*	*	*	13500	*	*	*	*
105	Gorakhpur U/S	Rapti	Uttar Pradesh	*	*	*	*	10150	*	*	*	*
71	GR Bridge	Godavari	Maharashtra	1583	1403	700	415	3369	3860	NoHS	D	D
72	Gudam Bridge	Pranhita	Maharashtra	-	575	120	-	629	1533	NoHS	D	NHS
73	Gummanur	Ponnaiyar	Tamil Nadu	1713	1339	1780	1448	2770	1102	IBHS	D	IBHS
74	Guwahati D.C.Court	Brahmaputra	Assam	-	289	1037	-	1854	572	NoHS	NHS	IBHS
75	Halia	Halia	Telangana	1289	1385	*	*	5725	6317	*	D	*
76	Hamirpur	Yamuna	Uttar Pradesh	23513	10520	6740	41200	15222	3067	D	D	IBHS
77	Hanging Bridge	Chambal/Parwati	Rajasthan	*	9325	*	*	15517	*	*	D	*
78	Haralahalli	Tungabhadra	Karnataka	11971	41218	21950	23000	36540	3470	D	IBHS	IBHS
79	Hariharapura	Tunga	Karnataka	42740	33880	33460	40467	35180	3500	IBHS	D	IBHS
80	Haripur	Tons	Uttarakhand	6773	9193	13967	7500	8187	5567	D	IBHS	IBHS
114	Hathidah	Ganga	Bihar	*	*	*	480	1884	1930	*	*	*
115	Hathikhana	Ganga	Uttar Pradesh	*	*	*	*	3700	3300	*	*	*
81	Hivra	Wardha	Maharashtra	700	1487	422	296	2148	600	NoHS	D	NHS
82	Hogenakkal	Chinnar	Tamil Nadu	4900	*	3300	*	1400	1700	*	*	IBHS
83	Holehonnur	Bhadra	Karnataka	29967	37653	12760	13707	23460	4970	IBHS	IBHS	IBHS
84	Honnali	Tungabhadra	Karnataka	46484	107587	6220	14213	25287	6633	IBHS	IBHS	D
85	Hoovinahole	Swarnamukhi	Karnataka	5140	*	*	*	*	*	*	*	*
86	Huvinhedgi	Krishna	Karnataka	1399	1318	647	935	3857	6033	IBHS	D	D
87	Irrukkankudi	Vaippar	Tamil Nadu	*	4900	1280	1276	*	775	*	*	IBHS
88	Jagdalpur	Indravathi	Chhattisgarh	1358	1218	238	1093	2979	4433	IBHS	D	NHS
123	Jajmau	Ganga	Uttar Pradesh	*	*	*	4700	7000	9200	*	*	*
124	Japla	Sone	Jharkhand	*	*	*	*	1593	875	*	*	*
89	Jaunpur	Gomti	Uttar Pradesh	3887	3440	3167	2693	1993	2200	IBHS	IBHS	IBHS
90	Jawahar Bridge, Agra	Yamuna	Uttar Pradesh	258667	97933	224000	198333	175000	63500	IBHS	D	IBHS
91	Jhalawad	Kalisindh	Rajasthan	*	14510	*	*	9280	*	*	IBHS	*
92	Jhansi Mirjapur Highway Road Bridge	Betwa	Uttar Pradesh	2953	3826	2640	2909	1989	1650	IBHS	IBHS	IBHS
93	K M Vadi	Cauvery/ Lakshmanthirth	Karnataka	7693	50375	19200	85400	388800	12700	D	D	IBHS
94	K.T.(Satrapur)	Kanhan	Maharashtra	*	7817	6500	8633	5657	2750	*	D	IBHS
131	Kachlabridge	Ganga	Uttar Pradesh	*	*	*	615	730	1200	*	*	*
95	Kailash Mandir, Near Benpur Village	Yamuna	Uttar Pradesh	377267	126213	208000	227500	154444	97500	IBHS	D	IBHS
96	Kalanaur	Yamuna	Uttar Pradesh	10687	11320	8233	12586	10567	7683	D	IBHS	IBHS
97	Kalpi	Yamuna	Uttar Pradesh	22880	9779	15640	50218	39413	2383	D	D	IBHS

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
98	Kamalpur	Banas	Gujarat	*	7050	*	*	3775	*	*	IBHS	*
136	Kannauj	Kali	Uttar Pradesh	*	*	*	*	9200	4500	*	*	*
137	Kanpur	Ganga	Uttar Pradesh	*	*	*	4400	3100	4500	*	*	*
99	Karad	Krishna	Maharashtra	*	11250	*	*	17000	4000	*	D	*
100	Karnal	Yamuna	Haryana	15107	9600	14133	21429	11347	6500	D	D	IBHS
140	Kasganj	Kali	Uttar Pradesh	*	*	*	*	12000	9200	*	*	*
141	Katri Umrauli	Ganga	Uttar Pradesh	*	*	*	*	4500	4000	*	*	*
142	Kazipura	Ramganga	Uttar Pradesh	*	*	*	*	11000	*	*	*	*
101	Keesara	Munneru	Andhra Pradesh	1224	1021	535	*	4490	3150	*	D	D
144	Kellodu	VEDAVATHI	Karnataka	*	*	*	350000	44867	10000	*	*	*
102	Keolari	Wainganga	Madhya Pradesh	528	1677	682	433	2117	1658	NoHS	D	D
103	Khanpur	Mahi	Gujarat	3200	5347	3300	3340	3620	3650	D	IBHS	D
104	Khatoli	Parwati	Rajasthan	21800	16000	10600	11391	12145	12800	IBHS	IBHS	D
148	Khudrakhowa	Manas NH Xing	Assam	*	123	133	16000	560	47	*	NHS	NoHS
105	Kodumudi	Cauvery	Tamil Nadu	889	1161	933	1048	1035	832	D	IBHS	IBHS
150	Koelwar	Sone	Bihar	*	*	*	*	2183	1075	*	*	*
106	Koggedoddi	Arkavathy	Karnataka	37217	42613	7380	177733	277453	4900	D	D	IBHS
107	Kokiwada	Pench	Madhya Pradesh	1813	1833	2548	996	1050	143	IBHS	IBHS	NoHS
108	Kollegal	Cauvery	Karnataka	47700	76920	3920	18438	13836	7280	IBHS	IBHS	D
109	Konta	Sabari	Chhattisgarh	1304	1255	655	1006	3121	4120	IBHS	D	D
110	Kopergaon	Godavari	Maharashtra	*	1387	*	*	6444	*	*	D	*
111	Kora	Rind	Uttar Pradesh	2131	1885	1720	2804	2486	1633	D	D	IBHS
112	Kudalaiyathur	Vellar	Tamil Nadu	945	*	-	*	174	*	*	*	*
113	Kudige	Cauvery	Karnataka	17467	57840	10060	53333	379693	11833	D	D	D
159	Kudlur	Palar	Tamil Nadu	*	*	*	*	1400	680	*	*	*
114	Kuldahbridge	Sone	Madhya Pradesh	3060	3080	1650	1635	879	1100	IBHS	IBHS	IBHS
115	Kulsi	Kulsi	Assam	18	498	550	1300	1638	120	NHS	D	NoHS
116	Kumhari	Wainganga	Madhya Pradesh	-	1134	338	-	1760	790	NoHS	D	NHS
117	Kuppelur	Kumudavathi	Karnataka	*	42256	*	*	32280	4850	*	IBHS	*
118	Kurundwad	Krishna	Maharashtra	*	5967	*	*	5886	7000	*	IBHS	*
165	Lakhisarai	Kiul	Bihar	*	*	*	*	2800	200	*	*	*
119	Lakkavalli	Bhadra	Karnataka	39320	70993	6820	10267	20947	6780	IBHS	IBHS	IBHS
120	Lakshmanapatti	Kodaganar	Tamil Nadu	640	2250	1533	832	1265	745	D	IBHS	IBHS
168	Lalganj	Gandak	Bihar	*	*	*	*	2340	1100	*	*	*
121	Lalpur	Sengar	Uttar Pradesh	2539	8540	2073	3982	7300	1867	D	IBHS	IBHS

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
122	Lodhikheda	Jam	Madhya Pradesh	3006	1547	5783	2487	2101	2030	IBHS	D	IBHS
171	Lucknow	Gomti	Uttar Pradesh	*	*	*	45333	28500	47000	*	*	*
123	Luwara	Shetrunji	Gujarat	10092	5713	5517	3556	3114	2750	IBHS	IBHS	IBHS
124	M H Halli	Hemavati	Karnataka	39544	23800	7440	18114	9433	1660	IBHS	IBHS	IBHS
125	Madhira	Wyra	Telangana	1143	962	422	790	5830	5283	IBHS	D	NHS
126	Madla	Ken	Madhya Pradesh	*	1418	1900	*	1460	2000	*	D	D
127	Magardhara	Wainganga	Madhya Pradesh	1357	1873	178	170	1100	987	NoHS	IBHS	NHS
128	Mahalgaon	Wainganga	Maharashtra	871	421	650	533	1009	425	IBHS	NHS	NoHS
129	Mahidpur	Shipra	Madhya Pradesh	*	40350	*	*	31480	*	*	IBHS	*
130	Maighat	Gomti	Uttar Pradesh	3173	3513	2600	2260	1680	2317	IBHS	IBHS	IBHS
131	Malkhed	Kangna	Karnataka	1931	1258	528	684	3792	4850	IBHS	D	D
181	Manas NH Xing	Manas NH Xing	Assam	*	185	143	9000	1740	883	*	NHS	NHS
132	Mancherial	Godavari	Telangana	1497	1236	547	1045	3364	3900	IBHS	D	D
133	Mandawara	Chambal	Rajasthan	11580	13027	10500	13600	13707	16667	D	D	D
134	Manderial	Chambal	Rajasthan	6953	12840	17000	17743	12460	10567	D	IBHS	IBHS
135	Mangaon	Kal	Maharashtra	*	6592	*	*	5015	3000	*	IBHS	*
186	Manjhi	Ghaghra	Bihar	*	*	*	*	3300	940	*	*	*
136	Mantralayam	Tungabhadra	Andhra Pradesh	1146	874	435	*	3948	4750	*	D	NHS
137	Marella	Gundlakamma	Andhra Pradesh	1071	460	395	*	5929	2833	*	NHS	NHS
138	Marol	Varada	Karnataka	*	58200	*	*	48900	14400	*	IBHS	*
139	Mataji	Mahi	Madhya Pradesh	9455	6600	8525	2550	3083	3000	IBHS	IBHS	IBHS
140	Mawi	Yamuna	Uttar Pradesh	143267	137067	156667	194857	57800	5483	D	IBHS	IBHS
192	Mehandipur	Ganga	Uttar Pradesh	*	*	*	*	8000	*	*	*	*
141	Mejaroad	Tons	Uttar Pradesh	2100	1987	1767	1257	1066	1072	IBHS	IBHS	IBHS
142	Mirzapur	Ganga	Uttar Pradesh	3607	4220	3550	2500	2000	1883	IBHS	IBHS	IBHS
143	Mohana	Betwa	Uttar Pradesh	9735	10879	4480	2785	2478	11183	IBHS	IBHS	D
144	Mohna	Yamuna	Haryana	718000	960667	2433333	3049286	1181333	458333	D	D	D
197	Moradabad	Ramganga	Uttar Pradesh	*	*	*	*	13000	11000	*	*	*
145	Mungoli	Penganga	Maharashtra	294	564	762	757	1137	1990	NHS	D	D
146	Munugodu	Edduvagu	Andhra Pradesh	1378	969	345	395	4067	3900	NoHS	D	NHS
147	Muradpur	Vashishti	Maharashtra	*	8336	*	*	25462	*	*	D	*
148	Murappanadu	Tambraparani	Tamil Nadu	308	717	903	812	845	723	NHS	D	IBHS
149	Musiri	Cauvery	Tamil Nadu	877	2723	1097	1185	668	1185	D	IBHS	D
150	Muthankera	Kabini	Kerala	26750	57733	25000	72267	391153	5800	D	D	IBHS
151	Nagothane	Amba	Maharashtra	*	4900	*	*	9508	*	*	D	*

S.No.	Water Quality Monitoring Station	River	State	Pre-M (2023)	M (2023)	Post- M (2023)	Pre-M (2024)	M (2024)	Post- M (2024)	Comparision of Hotspots during year 2023 with 2024		
										Pre-M	M	Post- M
152	Naidupet	Swarnamukhi	Andhra Pradesh	523	817	-	170	193	-	NoHS	NoHS	NoHS
153	Nallamaranpatty	Amaravathi	Tamil Nadu	283	865	615	883	795	653	NHS	IBHS	D
154	Nanded	Godavari	Maharashtra	1118	1543	412	1183	3093	8267	D	D	NHS
155	Nandgaon	Wunna	Maharashtra	2421	1192	1700	1341	2375	1053	IBHS	D	IBHS
156	Nandipalli	Sagileru	Andhra Pradesh	-	-	1077	-	-	218	NoHS	NoHS	NoHS
157	Nasik	Godavari	Maharashtra	1495	1218	630	1279	3933	8567	IBHS	D	D
158	Naugaon	Yamuna	Uttarakhand	4693	6040	7067	7657	8027	6217	D	D	IBHS
210	Neemsar	Gomti	Uttar Pradesh	*	*	*	930	1040	*	*	*	*
159	Nellore	Pennar	Andhra Pradesh	-	-	1695	-	-	*	NoHS	NoHS	*
160	Noida	Yamuna	Uttar Pradesh	10793333	2833333	3683333	6607143	1146667	668333	IBHS	IBHS	IBHS
161	Nona	Nona	Assam	*	636	1410	800	357	1592	*	NoHS	D
162	Nowrangpur	Indravathi	Odisha	1411	1070	692	1304	2839	4000	IBHS	D	D
163	Odenthurai	Kallar	Tamil Nadu	2691	993	1063	765	1011	1010	IBHS	D	IBHS
164	Orai Rath marg Road Bridge, Chikasi	Betwa	Uttar Pradesh	10113	9865	5340	3764	2033	4583	IBHS	IBHS	IBHS
165	P.G.Bridge	Penganga	Maharashtra	617	1263	333	268	1793	2693	NoHS	D	NHS
166	Pachawali	Sindh	Madhya Pradesh	*	2096	*	*	1216	*	*	IBHS	*
167	Pachegaon	Pravara	Maharashtra	1357	1160	-	*	3800	*	*	D	*
168	Padardibadi	Mahi	Rajasthan	14894	5540	7283	3580	3020	3750	IBHS	IBHS	IBHS
220	Pagladiya	Pagladiya	Assam	*	92	307	*	2860	43	*	NHS	NoHS
169	Paleru Bridge	Paleru	Andhra Pradesh	1216	920	528	*	5420	7617	*	D	D
170	Pali	Chambal	Rajasthan	10573	11427	10633	15093	11527	10467	D	D	IBHS
223	Paliakalan	Sharda	Uttar Pradesh	*	*	*	*	1240	*	*	*	*
171	Palla	Yamuna	Delhi	199333	146800	155833	324143	236000	109333	D	D	IBHS
225	Pancharatna	Brahmaputra	Assam	*	162	500	2400	497	27	*	NoHS	NoHS
172	Paramkudi	Vaigai	Tamil Nadu	1080	*	3350	633	1100	868	IBHS	*	IBHS
173	Pargaon	Bhima	Maharashtra	*	12233	*	*	6721	*	*	IBHS	*
228	Parmat ghat	Ganga	Uttar Pradesh	*	*	*	3400	3950	4500	*	*	*
229	Parsohan ghat	Burhi Rapti	Uttar Pradesh	*	*	*	1100	1200	1400	*	*	*
174	Patala	Wardha	Maharashtra	681	3035	1872	1671	1706	497	D	IBHS	NoHS
175	Patansaongi	Chandrabhaga	Maharashtra	1909	1281	768	1744	2391	1407	IBHS	D	D
176	Pathagudem	Indravathi	Chhattisgarh	1527	1010	812	1000	3195	3683	IBHS	D	D
177	Pauni	Wainganga	Maharashtra	1825	1485	1445	916	1755	1312	IBHS	D	IBHS
178	Perur	Godavari	Telangana	1517	994	617	969	2879	3800	IBHS	D	D
179	Phulgaon	Bhima	Maharashtra	*	20333	*	*	2817	*	*	IBHS	*
180	Poanta	Yamuna	Himachal Pradesh	27800	9860	6433	6700	9920	11267	IBHS	D	D

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										Pre-M	M	Post- M
181	Poiyaghat, Agra	Yamuna	Uttar Pradesh	337267	112533	171800	206667	194444	109167	IBHS	D	IBHS
182	Polavaram	Godavari	Andhra Pradesh	1516	1549	452	880	3186	2933	IBHS	D	NHS
183	Pratap pur	Yamuna	Uttar Pradesh	4016	3511	2143	4975	3989	2500	D	D	D
184	Pratapgarh	Sai	Uttar Pradesh	4240	3260	1650	2067	1332	1685	IBHS	IBHS	D
185	Pratappur	Pravara	Maharashtra	1320	1846	2143	1400	4367	5400	D	D	D
186	Purna	Purna	Maharashtra	*	1249	550	1700	3731	6667	*	D	IBHS
187	Puthimari	Puthimari	Assam	*	169	1340	330	2194	113	*	NHS	NoHS
188	Rahu (Mirawadi)	Mula-Mutha	Maharashtra	*	13083	*	*	7000	*	*	IBHS	*
245	Rai Bareli	Sai	Uttar Pradesh	*	*	*	1000	1440	1700	*	*	*
246	Rajahmundry	Godavari	Andhra Pradesh	*	*	*	891	3714	4767	*	*	*
189	Rajapur	Yamuna	Uttar Pradesh	6060	5533	4720	5558	4467	3233	IBHS	IBHS	IBHS
190	Rajegaon	Pranhita	Madhya Pradesh	406	1555	235	600	2200	623	NHS	D	NHS
191	Rajghat (Agra)	Betwa	Uttar Pradesh	1613	1323	1716	2784	1668	1783	D	D	D
192	Ramakona	Kanhan	Madhya Pradesh	2307	3313	2053	177	2066	720	NoHS	IBHS	IBHS
193	Rangeli	Som	Rajasthan	5277	8027	3833	3473	3160	3133	IBHS	IBHS	IBHS
252	Regauli	Rapti	Uttar Pradesh	*	*	*	2100	2200	3300	*	*	*
194	Renukaji	Giri	Himachal Pradesh	4527	6620	5900	6964	8153	9400	D	D	D
195	Sahijana	Betwa	Uttar Pradesh	2767	2379	1996	2990	1622	2858	D	IBHS	D
196	Saidpur	Ganga	Uttar Pradesh	3353	3620	2100	2707	1953	2083	IBHS	IBHS	IBHS
197	Saigaon	Manjira	Karnataka	*	1335	*	*	4418	2800	*	D	*
198	Sakhara	Wainganga	Maharashtra	1161	1573	823	2077	2025	1505	D	D	D
199	Sakleshpura	Hemavati	Karnataka	28183	105587	16080	19364	40380	10900	IBHS	IBHS	IBHS
200	Sakmur	Wardha	Maharashtra	1267	1040	1142	204	1118	300	NoHS	D	NoHS
201	Salebardi	Wainganga	Maharashtra	*	1575	-	648	956	-	*	IBHS	NoHS
202	Saloora	Manjira	Telangana	1297	1491	455	590	2185	3267	IBHS	D	D
203	Samdoli	Warna	Maharashtra	*	9079	*	*	4514	3917	*	IBHS	*
204	Sangam(LGD)	Kinnerasani	Telangana	1181	1019	447	1021	2959	4220	IBHS	D	NHS
205	Sangod	Parwan	Rajasthan	*	10320	*	*	9911	*	*	IBHS	*
206	Saradaput	Sabari	Odisha	1292	957	838	934	3116	3133	IBHS	D	D
207	Sarangpur	Kalisindh	Madhya Pradesh	*	20280	*	*	25143	*	*	D	*
267	Sarati	Nira	Maharashtra	*	*	*	*	2144	*	*	*	*
208	Satna	Tons	Madhya Pradesh	3513	2327	2400	1478	854	915	IBHS	IBHS	IBHS
209	Satpokhali	Koa	Assam	*	705	*	*	*	*	*	*	*
210	Satrapur	Kanhan	Maharashtra	2607	2079	1150	1119	4457	1427	IBHS	D	D
211	Savandapur	Bhavani	Tamil Nadu	681	881	755	759	1051	985	D	D	D

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										Pre-M	M	Post- M
271	Seohara	Ramganga	Uttar Pradesh	*	*	*	*	12500	11000	*	*	*
212	Seondha	Sindh	Madhya Pradesh	1233	1681	2088	2538	1620	1867	D	IBHS	IBHS
213	Sevanur	Chittar	Tamil Nadu	3513	*	1100	*	1370	1517	*	*	D
274	Shahjahanpur	Khannaut	Uttar Pradesh	*	*	*	*	17000	13000	*	*	*
214	Shahzadpur	Ganga	Uttar Pradesh	3447	3980	3000	1900	1525	1655	IBHS	IBHS	IBHS
215	Shastri Bridge	Ganga	Uttar Pradesh	3900	3953	2867	2327	1847	1800	IBHS	IBHS	IBHS
216	Shimoga	Tunga	Karnataka	18967	39800	30600	50333	56938	3750	D	D	IBHS
217	Singasadanapalli	Ponnaiyar	Tamil Nadu	631000	430000	433333	892000	1845333	578333	D	D	D
279	Sitapur	sarayan	Uttar Pradesh	*	*	*	680	903	*	*	*	*
218	Sonapur	Digaru	Assam	-	581	1570	*	1573	113	*	D	NoHS
281	Sripalpur	Punpun	Bihar	*	*	*	*	2200	1040	*	*	*
219	Suddakallu	Dindi	Telangana	1192	1252	400	631	8986	4433	IBHS	D	NHS
220	Sultanpur	Gomti	Uttar Pradesh	3400	3227	3900	3053	2113	2000	IBHS	IBHS	IBHS
221	Sulurpet	Kalingi	Andhra Pradesh	3623	*	-	220	262	-	NoHS	*	NoHS
222	T Bekuppe	Arkavathy	Karnataka	209691	156067	77600	144333	304547	19867	IBHS	D	IBHS
223	T K Halli	Shimsha	Karnataka	94696	78345	22750	*	14600	16667	*	IBHS	IBHS
224	T Narsipura	Kabini	Karnataka	16263	56200	14960	14920	12213	6660	IBHS	IBHS	IBHS
225	T. Ramapuram	Hagari	Karnataka	1415	713	342	790	3600	4117	IBHS	D	NHS
226	Tadipatri	Pennar	Andhra Pradesh	1993	132	*	*	2967	*	*	NHS	*
227	Tal	Chambal	Madhya Pradesh	*	11433	*	*	15625	*	*	D	*
228	Terwad	Panchganga	Maharashtra	*	6358	*	*	11879	5500	*	D	*
291	Thandalaiputhur	Ayyar	Tamil Nadu	*	*	*	*	*	877	*	*	*
229	Thengudi	Thirumalairajanar	Tamil Nadu	633	-	-	136	-	-	NoHS	NoHS	NoHS
230	Thengumarahada	Bhavani / Moyar	Tamil Nadu	2301	531	505	522	1144	637	IBHS	D	D
231	Theni	Vagai/Suruliar	Tamil Nadu	1181	1130	877	972	608	1167	IBHS	IBHS	D
232	Thevur	Sarabenga	Tamil Nadu	2621	775	1467	615	1869	1157	IBHS	D	IBHS
233	Thimmanahalli	Yagachi	Karnataka	29489	56207	10160	27333	24427	5167	IBHS	IBHS	IBHS
234	Thoppur	Thoppaiyar	Tamil Nadu	3026	*	*	*	*	1593	*	*	*
297	Tiharkhera	Ramganga	Uttar Pradesh	*	*	*	*	4500	12000	*	*	*
298	Tondarpur	Sukheta	Uttar Pradesh	*	*	*	*	11000	9300	*	*	*
235	Tonk	Banas	Rajasthan	*	12600	*	*	18818	*	*	D	*
236	Tuini	Tons	Uttarakhand	5147	4747	5567	8914	7867	6600	D	D	D
301	Turtipar	Ghaghra	Uttar Pradesh	*	*	*	8100	4600	9400	*	*	*
237	U/S (Bamni)	Wardha	Maharashtra	*	4770	1480	2409	3240	1473	*	IBHS	IBHS
238	U/S (Satrapur)	Kanhan	Maharashtra	*	2628	3178	3567	3293	2433	*	D	IBHS

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										Pre-M	M	Post- M
239	Udi	Chambal	Uttar Pradesh	4159	5511	5920	7900	2411	2567	D	IBHS	IBHS
240	Ujjain	Shipra	Madhya Pradesh	*	186917	330000	*	91833	78000	*	IBHS	IBHS
241	Urachikottai	Cauvery	Tamil Nadu	1090	555	*	775	777	848	IBHS	D	*
242	V S Bridge	Ganga	Uttar Pradesh	3700	4207	2650	2720	2013	1817	IBHS	IBHS	IBHS
243	Varanasi	Ganga	Uttar Pradesh	4173	3920	2817	2787	2260	2300	IBHS	IBHS	IBHS
244	Varanavasi	Maruthaiyar	Tamil Nadu	1090	883	780	1100	*	1058	D	*	D
245	Vautha	Sabarmati	Gujarat	418615	85933	65833	54733	51533	51500	D	IBHS	IBHS
246	Veligonda	Musi	Telangana	3438	1342	755	1620	5554	13280	IBHS	D	D
247	Vijayawada	Krishna	Andhra Pradesh	1383	1022	457	1091	4471	3800	IBHS	D	NHS
248	Vrindawan Bridge (Mathura U/S)	Yamuna	Uttar Pradesh	432857	208667	333333	383000	151933	75667	IBHS	IBHS	IBHS
249	Wadakbal	Sina	Maharashtra	*	60000	*	*	29636	22000	*	IBHS	*
250	Wadenapally	Krishna	Telangana	1246	1109	573	893	3321	6667	IBHS	D	D
251	Wairagarh	Khobragadi	Maharashtra	-	1267	490	-	1477	1217	NoHS	D	NHS
252	Warunji	Koyna	Maharashtra	*	15325	*	*	3300	2300	*	D	*
253	Watrak Nr Vautha	Watrak	Gujarat	33000	11225	5000	*	3300	*	*	IBHS	*
254	Yadgir	Bhima	Karnataka	*	1086	700	*	4077	5400	*	D	D
255	Yamuna Expessway Road Bridge, Etamadpur	Yamuna	Uttar Pradesh	412000	149333	252000	234167	244222	48833	IBHS	D	IBHS
256	Yashwant Nagar	Giri	Himachal Pradesh	5607	11879	8200	9850	9880	9100	D	IBHS	D
257	Yelli	Godavari	Maharashtra	1341	1244	502	1241	2973	4333	IBHS	D	D

(-) means No Hotspot

(*) means Data not available/ river dry.

No Hot Spot (NoHS)

Deteriorate (D)

New Hotspot (NHS)

Improved but Hotspot (IBHS)

CHAPTER – 9

Conclusion

The study conducted covered a total of 768 water quality monitoring stations situated in important rivers across the country to identify water quality hotspots. The study report is based on the average values recorded during pre-monsoon, monsoon and post-monsoon seasons at these monitoring stations for 2024. The report provides a detailed analysis of 13 water quality parameters, highlighting the water quality status at various locations in India. The report also sheds light on the variations observed in the parameters essential for both the Central Pollution Control Board (CPCB) and Bureau of Indian Standards (BIS) classifications, along with parameters specific to the primary water quality criteria for bathing water as per the Ministry of Environment, Forest and Climate Change (MoEFCC). Based on the water quality data analysis, the following observations have been found:

pH

The pH levels of water across various rivers in India exhibit significant variability, influenced by seasonal factors and human activities. The analysis spanning pre-monsoon, monsoon, and post-monsoon seasons reveals widespread deviations from the recommended pH range of 6.5 to 8.5, with numerous monitoring stations exceeding these limits. In 2024, the minimum pH value observed was 4.57 at Kharkhana, Myntdu River, Meghalaya and the maximum pH value was 8.89 at Barod, Kalisindh River, Rajasthan. Throughout the study period, 30 water quality stations at 21 rivers recorded pH levels that exceeded the acceptable limit. During each season, pH levels fluctuated widely, with notable exceedances persisting, especially during the pre-monsoon period due to reduced dispersal of pollutants and increased human activities like industrial discharge and agriculture runoff.

Comparisons between 2023 and 2024 highlighted consistent patterns, with the pre-monsoon season consistently showing the highest number of exceedances. In contrast, the monsoon season shows a mitigating effect, suggesting natural dispersal processes help restore pH balance in river ecosystems.

Electrical Conductivity (EC)

The analysis of electrical conductivity (EC) across various water quality monitoring stations reveals significant fluctuations influenced by seasonal variations and human activities. The comparison of hotspots at various monitoring stations along rivers during the years 2023 and 2024 reveals significant changes in river water quality. Specifically, the comparison of

water quality hotspots at monitoring stations along the Wardha River in Maharashtra, the Noyyal River in Tamil Nadu and the Shetrunji River in Gujarat during the years 2023 and 2024 shows significant variations in electrical conductivity. The Central Pollution Control Board (CPCB) has set the limit for class-E irrigation, industrial cooling, and controlled waste disposal at less than 2250 µS/cm at 25°C.

The comparison of electrical conductivity hot spots between 2023 and 2024 reveals significant trends across the different seasons: Pre-Monsoon, Monsoon, and Post-Monsoon.The fluctuating EC levels observed across seasons highlight the dynamic nature of pollutant inputs and dispersal effects, particularly evident during the monsoon period when increased runoff can either exacerbate or mitigate EC levels depending on local conditions.

Ammonia as N (NH_3-N)

In both 2023 and 2024, concerning water quality, alarming trends of ammonia were observed across various rivers. In 2023, 42 water quality monitoring stations along 20 rivers, such as Agra Canal, Arpa, Bearma, Bhima, Brahmani, Dhadhar, Hindon, Hindon Cut, Kanhan, Kharkai, Kodaganar, Koel, Mula-Mutha, Ponnaiyar, Sabarmati, Sahibi, Sina, Wardha, Watrak and Yamuna, exceed the established threshold for Ammonia concentration at 1.2 mg/L.The following year, in 2024, the issue persisted and intensified, with 47 water quality monitoring stations along the 22 rivers (Agra Canal, Arkavathy, Betwa, Bhima, Brahamani, Damodar, Dhadhar, Dudhnai, Ganga, Gumti, Hindon, Hindon Cut, Kali, Kaliyar, Kanhan, Kim, Ponnaiyar, Sabarmati, Shipra, Sina, Wardha and Yamuna, exceeding the established threshold for Ammonia concentration at 1.2 mg/L.

22 water quality monitoring stations on 11 rivers, namely Ponnaiyar, Kanhan, Bhima, Brahamani, Dhadhar, Hindon, Hindon Cut, Sina, Sabarmati, Wardha and Yamuna consistently showed elevated ammonia as consistent hotspots. The primary contributors to this issue were identified as industrial discharges, agricultural runoff, and urban wastewater. Untreated or inadequately treated effluents released from industrial activities, along with urban areas contributing to increased ammonia levels, were found to be significant factors impacting the water quality of these rivers.

Fluoride (F^-)

The BIS recommends an upper desirable limit of 1.0 mg/l of fluoride in drinking water, which can be extended to 1.5 mg/l if no alternative source is available. During 2023, six (06) monitoring stations namely Kamalapuram (Papagani), Lakshmanapatti (Kodaganar), Lingdem (HS) (Talangchu), R.S.P

(Brahmani), R.S.P-1 (Brahmani) and Tadipatri (Pennar) surpassed the acceptable limits for fluoride concentrations. But, in 2024, only one (01) water quality monitoring at Lingdem Hot Spring (Talang Chu River) station recorded fluoride levels above the permissible thresholds.

In both 2023 and 2024, one water quality monitoring station was consistently identified: at Lingdem Hot Spring (Talang Chu River). The presence of fluoride in this location, Talang chu (hot spring), is likely due to the leaching of fluoride-bearing minerals from rocks.

Total Hardness (TH))

The assessment of total hardness levels at water quality monitoring stations reveals consistent exceedances of permissible limits set by IS 10500:2012, which specifies 200 mg/L as acceptable and extends to 600 mg/L in the absence of alternative water sources. The presence of minerals like calcium and magnesium contributes to elevated hardness levels, impacting industrial processes, agricultural practices, and domestic water use. In 2023, three (03) water quality monitoring stations, namely B.P.M. (Bamni) on the Wardha river Maharasthra, Lakshmanapatti on the Kodaganar River Tamil nadu, and Luwara on the Shetrunji river Gujrat, showed total hardness values above the permissible limit of BIS 10500:2012 for the pre-monsoon, monsoon and post-monsoon seasons. Similarly, in 2024, four (04) stations, specifically B.P.M. (Bamni) on the Wardha river, Dhansa on Sahibi River, Lakshmanapatti on the Kodaganar River and Luwara on the Shetrunji River, recorded total hardness levels above the permissible thresholds.

Three water quality monitoring stations were commonly identified Hot Spot in both 2023 and 2024: B.P.M. (Bamni) (Wardha River) in Maharashtra, Lakshmanapatti on the Kodaganar River Tamil nadu and Luwara (Shetrunji River) in Gujarat underscores the variability and intensity of hardness levels in these regions.

Chloride (Cl^-)

The evaluation of chloride concentrations at water quality monitoring stations reveals concerning exceedances of permissible limits defined by IS 10500:2012. The acceptable limit for chloride in drinking water is set at 250 mg/L, with a permissible limit extending to 1000 mg/L in the absence of alternative water sources. During 2023, three (03) water quality stations - Durvesh (Vaitarna river), Lakshmanapatti (Kodaganar river), and Luwara (Shetrunji river) - exceeded the permissible limit of 1000 mg/L for chloride. Luwara (Shetrunji river) in Gujarat was the only station identified as a hotspot in both 2023 and 2024, underscoring ongoing challenges in

managing chloride contamination, likely stemming from industrial effluents, agricultural runoff, and urban waste inputs. High chloride levels often indicate the presence of industrial effluents, agricultural runoff, or urban waste, which pose risks to aquatic ecosystems and public health.

The water quality with respect to chloride in 2024 increased in study area as compared to 2023.

Boron (B)

Boron, a vital element present in the earth's crust, plays significant roles in natural and industrial processes. The Central Pollution Control Board (CPCB) regulates boron levels, setting a stringent limit of 2 mg/l for specific classes such as irrigation, industrial cooling, and controlled waste disposals. Monitoring conducted across seasons—pre-monsoon, monsoon, and post-monsoon—consistently indicates that average boron concentrations at various stations remain within the permissible limit prescribed by CPCB.

Nitrate as N (NO_3^--N)

In 2023, the lowest nitrate concentration (among hotspots values) of 10.30 mg/L was observed at the Jamtara WQ station on River Ajoy, while the highest concentration of 23.04 mg/L was recorded at the Hanskhali WQ station on River Churni/Bhagirathi. A total of 42 water quality stations at 27 rivers exceeded the nitrate concentration in 2023.
In 2024, 22 water quality stations at 21 rivers exceeded the nitrate concentration. The comparison of nitrate-nitrogen (N) hot-spots between 2023 and 2024 highlights significant trends across different seasons.

The comparison of the number of hotspots in all seasons between 2023 and 2024 indicates an improving trend in water quality.

Six (06) water quality stations, namely Gummanur, Koggedoddi, Madhira, Munugodu, Purna and T Bekuppe are located along six (06) rivers (Ponnaiyar, Arkavathi, Wyra, Edduvagu, Purna and Arkavathy) and were identified as common hotspot stations between 2023 and 2024 showed seasonal variations in nitrate concentrations, underscoring localized impacts and the need for targeted management strategies.

Dissolved Oxygen (DO)

The assessment of dissolved oxygen (DO) levels across numerous water quality monitoring stations during 2024 reveals a concerning trend, indicating potential risks to outdoor bathing in rivers. The Central Pollution Control Board (CPCB) recommends a minimum concentration of 5.0 mg/l of DO for safe outdoor bathing in Class B waters. However, data from one hundred fifty-six (156) at eight six (86) rivers found below 5 mg/L. In 2023,

the pre-monsoon, monsoon, and post-monsoon seasons collectively saw 86, 99, and 62 stations reporting DO values below 5.0 mg/l, respectively. Transitioning to 2024, the pre-monsoon season began with 98 stations below the threshold, marking a slight increase from the previous year. The monsoon season of 2024 recorded an alarming rise, with 102 stations reporting inadequate DO levels, reflecting a worsening situation compared to 2023. The trend slightly improved into the post-monsoon season of 2024, with 57 stations underscoring ongoing challenges in maintaining DO concentrations suitable for outdoor activities.

Biochemical Oxygen Demand (BOD)

The Biochemical Oxygen Demand (BOD) serves as a critical indicator of river water quality, reflecting the impact of human activities on aquatic ecosystems and guiding pollution control efforts. Throughout 2024, alarming trends in BOD levels were observed across India's river systems. During 2024 Biochemical oxygen demand at 146 water quality stations on 70 rivers across 15 states found above 3 mg/L.

During the pre-monsoon season of 2024, the pre-monsoon season witnessed 107 water quality monitoring stations on 48 rivers across 14 states reported BOD values exceeding 3.0 mg/l, with extremes ranging from a Minimum BOD value 3.01 mg/L was recorded at Elunuthimangalam on River Noyyal in Tamil Nadu and maximum BOD value 70.09 mg/L was recorded at Satrapur station on the Kanhan River in Maharashtra. These findings highlight varying degrees of organic pollution, with lower BOD values indicating relatively cleaner water. In the monsoon season, 103 water quality monitoring stations on 48 rivers in 13 states of India exceed the BOD limit 3.0mg/l. During monsoon, Minimum BOD Value 3.01 mg/L recorded at Cholachagudda on River Malaprabha Karnatka and Varanasi on River Ganga Uttar Pradesh and maximum BOD Value was recorded 70.96 mg/L at Singasadanapalli station on the Ponnaiyar River in Tamil Nadu. Stations with low BOD values, such as Baluaghat, Cholachagudda, Dhengbridge, Keolari, Naidupet, Sultanpur and Varanasi, indicate lower levels of organic pollution even during the monsoon season. Conversely, stations with high BOD values, like Singasadanapalli, Kalindi Kunj, Noida and Satrapur, signify severe organic contamination, likely due to untreated sewage and agricultural runoff. in the post-monsoon season, 87 water quality monitoring stations on 36 rivers in 13 states of India exceed the BOD limit 3.0mg/l. In post monsoon, Minimum BOD Value 3.03 mg/L was recorded at Jajmau station on Ganga River in Uttar Pradesh and maximum BOD Value was recorded 66.43 mg/L at Singasadanapalli station on the Ponnaiyar River in Tamil Nadu.

In 2024, the number of water quality monitoring stations decreased for all seasons compared to 2023, indicating improvement in the water quality of the rivers. During the pre-monsoon, monsoon, and post-monsoon seasons in 2023 and 2024, 81 water quality stations across 41 rivers were identified as common hotspot stations. Comparing the seasonal trends, it's evident that the pre-monsoon season generally witnesses higher BOD levels compared to the monsoon and post-monsoon seasons. This is attributed to dillution of pollutants out from urban and agricultural areas during heavy rainfall.

Total Coliform (TC)

In the pre-monsoon season, 227 water quality monitoring stations on 101 rivers across 16 states of India reported average TC values exceeding 500 MPN/100 ml during 2024 as compared to 2023 where 199 water quality monitoring stations on 97 rivers across 16 states of India exceeding 500 MPN/100 ml TC.

In the monsoon season, 359 water quality monitoring stations on 174 rivers in 19 states of India during 2024 as compared to 2023 where 258 water quality monitoring stations on 124 rivers across 17 states of India exceeding 500 MPN/100 ml TC.

Finally, in the post-monsoon season, 317 water quality monitoring stations on 163 rivers in 20 states of India recorded average TC values exceeding 500 MPN/100 ml during 2024 as compared to 2023 where 215 water quality monitoring stations on 111 rivers across 17 states of India exceeding 500 MPN/100 ml TC.

The widespread occurrence of elevated TC levels throughout all seasons in 2023 highlights the urgent need for comprehensive strategies aimed at improving sanitation infrastructure, controlling non-point source pollution, and promoting sustainable practices to safeguard the quality of India's rivers.

Faecal coliform (FC)

Faecal coliforms (FC) serve as crucial indicators of faecal contamination in river water, reflecting potential risks associated with microbial pathogens originating from human and animal waste. The prevalence of elevated FC levels in India's river systems during all season of 2024 underscores significant challenges in maintaining water quality and safeguarding public health.

During pre-monsoon season, 201 water quality monitoring stations on 89 rivers across 18 states reported average FC values exceeding 500 MPN/100

ml during 2024 as compared to 2023 where 184 water quality monitoring staions on 90 Rivers across the 16 states in India exceeding 500 MPN/100 ml FC.

In the monsoon season, 310 water quality monitoring stations on 137 rivers across 19 states displayed similar findings during 2024 as compared to 2023 where 238 water quality monitoring stations on 111 Rivers across the 17 states in India exceeding 500 MPN/100 ml FC.

Finally, in the post-monsoon season, 261 water quality monitoring stations on 121 rivers in 19 states recorded average FC values exceeding 500 MPN/100 ml during 2024 as compared to 2023 where 181 water quality monitoring stations on 91 Rivers across the 17 states in India exceeding 500 MPN/100 ml FC.

The consistent detection of elevated FC levels across all seasons in 2023 underscores the critical importance of implementing robust monitoring protocols, enhancing wastewater treatment infrastructure, promoting responsible agricultural practices, and fostering public awareness to protect and preserve India's river ecosystems.

Sodium Adsorption Ratio (SAR)

All the samples have been found within the acceptable limit of the SAR.

ABBREVIATION

Ammonia	**NH_3**
Andhra Pradesh	**AP**
Alpha Benzenehexachloride	**BHC**
Biochemical Oxygen Demand	**BOD**
Bureau of Indian Standards	**BIS**
Boron	**B**
Calcium	**Ca^{+2}**
Cauvery Division	**CD**
Central Pollution Control Board	**CPCB**
Central Water Commission	**CWC**
Chambal Division	**CD**
Chenab Division	**CD**
Chloride	**Cl^{-}**
Dissolved Oxygen	**DO**
Dichlorodiphenyltrichloroethane	**DDT**
Eastern River Division	**ERD**
Electrical Conductance	**EC**
Godavari Division	**GD**
Himachal Pradesh	**HP**
Himalayan Ganga Division	**HGD**
Hydrology Division	**HD**
Hot Spring	**HS**
Iron	**Fe**
Lower Krishna Division	**LKD**
Lower Yamuna Division	**LYD**
Madhya Pradesh	**MP**
Magnesium	**Mg^{+2}**
Mahanadi Division	**MD**
Mahi Division	**MD**
Middle Brahmaputra Division	**MBD**
Middle Ganga Division	**MGD**
Monsoon Season	**M**
Narmada Division	**ND**
Nitrate	**NO_3^{-1}**
Pre-Monsoon Season	**Pre-M**
Post-Monsoon Season	**Post-M**
Sodium Absorption Ratio	**SAR**
South Western Rivers Division	**SWR**
Southern Rivers Division	**SRD**
Sulphate	**SO_4^{-2}**
Tapi Division	**TD**
Total Dissolved Solids	**TDS**
Total Coliforms	**TC**
Total Hardness	**TH**
Upper Yamuna Division	**UYD**
Uttar Pradesh	**UP**
Wainganga Division	**WGD**
Rourkela Steel Plant	**RSP**
Madhya Bharat Paper Ltd	**MBPL**

Annexure-I

Water Quality Laboratories of CWC& NABL accreditation Status

Out of 24 Water Quality Laboratories in CWC, 22 laboratories got accredited by NABL as on May, 2025.

List of Water Quality Labs in CWC			
S.No.	**Location of laboratory**	**Level of Laboratory**	**Organisation**
1	National River Water Quality Laboratory, New Delhi	III	YBO, New Delhi
2	Lower Cauvery Water Quality Laboratory, Coimbatore	III	C&SRO, Coimbatore
3	Upper and Middle Ganga Water Quality Laboratory, Varanasi	III	LGBO, Patna
4	Krishna and Godavari River Water Quality Laboratory, Hyderabad	III	K&GBO, Hyderabad
5	Upper Cauvery Water Quality Laboratory, Bangalore	II	MSO, Bangalore
6	South Western Flowing Rivers Water Quality Laboratory, Kochi	II	C&SRO, Coimbatore
7	Upper Krishna Division Water Quality Laboratory, Pune	II	K&GBO, Hyderabad
8	Mahi Division Water Quality Laboratory, Gandhinagar	II	MTBO, Gandhinagar
9	Lower Yamuna Water Quality Laboratory, Agra	II	YBO, New Delhi
10	Eastern Rivers Water Quality Laboratory, Bhubaneswar	II	M&ERO, Bhubaneswar
11	Hydrology Division, Chennai	II	C&SRO, Coimbatore
12	Wainganga Division, Nagpur	II	MCO, Nagpur
13	Chenab Division, Jammu	II	IBO, Chandigarh
14	Middle Ganga Division -I, Lucknow	II	UGBO, Lucknow
15	Mahanadi Division, Raipur	II	M&ERO, Bhubaneswar
16	Middle Brahmaputra Division, Guwahati	III	BBO, Guwahati
17	Lower Brahmaputra Division, Jalpaiguri	II	T&BDBO, Kolkata
18	U.B. Division, Dibrugarh	II	BBO, Guwahati
19	Lower Ganga Division-3, Berhampore	II	T&BDBO, Kolkata
20	Middle Ganga Division-5, Patna	II	LGBO, Patna
21	Narmada Division, Bhopal	II	NBO, Bhopal
22	Tapi Division, Surat	II	MTBO, Gangdinagar
23	Himalayan Ganga Division, Haridwar	II	UGBO, Lucknow
24	Meghna Division, Silchar	II	BOBO, Shillong

Annexure-II

List of Parameters analyzed in different levels of Water Quality Labs of CWC

Sl.No.	Level-I (465 Labs)	Level-II (19 Labs)	Level-III (05 Labs)
1	Temperature	Temperature	Temperature
2	Colour and Intensity	pH	pH
3	Odour	Electrical Conductivity	Electrical Conductivity
4	pH	Dissolved Oxygen (DO)	Dissolved Oxygen (DO)
5	Electrical Conductivity	Turbidity	Turbidity
6	Dissolved Oxygen	Biochemical Oxygen Demand (BOD)	Biochemical Oxygen Demand (BOD)
7	Weather	Chemical Oxygen Demand (COD)	Chemical Oxygen Demand (COD)
8	Depth of main stream/depth of water table	Total Dissolved Solids (TDS)	Total Dissolved Solids (TDS)
9	Visible effluent discharge	Sodium	Sodium
10	Human activities Around station	Calcium	Calcium
11	Station details	Magnesium	Magnesium
12	Velocity	Potassium	Potassium
13	Discharge	Phenolphthalein Alkalinity (Carbonate)	Phenolphthalein Alkalinity (Carbonate)
14	Water Level	Total Alkalinity	Total Alkalinity
15		Chloride	Chloride
16		Sulphate	Sulphate
17		Fluoride	Fluoride
18		Boron	Boron
19		Ammoniacal Nitrogen	Ammoniacal Nitrogen
20		Nitrate	Nitrate
21		Nitrite	Nitrite
22		Phosphate	Phosphate
23		Silicate	Silicate
24		Total Coliform MPN/100 ml	Total Coliform MPN/100 ml
25		Fecal Coliform MPN/100 ml	Fecal Coliform MPN/100 ml
26		E. Coli	E. Coli
27		Faecal Streptococci	Faecal Streptococci
28		Hardness	Hardness
29		NO2+NO3	NO2+NO3
30		Sodium Adsorption Ratio	Sodium Adsorption Ratio
31		% Sodium	% Sodium
32		Residual Sodium Carbonate	Residual Sodium Carbonate
33			Arsenic
34			Cadmium
35			Chromium
36			Copper
37			Iron
38			Lead
39			Nickel
40			Mercury
41			Zinc
42			Alpha BHC
43			Beta BHC
44			Gama BHC (Lindane)
45			OP DDT
46			PP-DDT
47			Alpha Endosulphan
48			Beta Endosulphan
49			Aldrin
50			Dieldrin
51			Carbaryl (Carbamate)
52			Malathion
53			Methyl Parathion
54			Anilophos
55			Chloropyriphos
56			2-4 D

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