

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI**

O.A.NO.694/2023

**SUOMOTO CASE TITLED "UN PREDICTS GROUNDWATER LEVEL
IN INDIA WILL REDUCE TO LOW BY 2025**

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FILED BY:-

Through



DELHI

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(For Central Ground Water Authority)

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
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**ADDITIONAL REPLY ON BEHALF OF CENTRAL GROUND WATER
AUTHORITY (R-1) AND MINISTRY OF JAL SHAKTI (R-2)**

MOST RESPECTFULLY SHOWTH:-

1. That the Hon'ble Tribunal registered OA No. 694/2023 on the basis of the news item published in Hindustan Times dated 26.10.2023 titled **"UN predicts Groundwater level in India will reduce to low by 2025"**. The Central Ground Water Authority hereinafter referred as to CGWA filed report on dated 22.11.2023. Further matter was listed on 24.11.2023 wherein Hon'ble Tribunal impleaded CGWA (R-1) and Ministry of Jal Shakti (R-2), MoEFCC (R-3) and 22 States/UTs as respondents.
2. That in compliance to the directions of the Hon'ble Tribunal issued vide order dated 24.11.2023, CGWA filed fresh report on 06.02.2024 containing following points:
 - A) State/UT wise availability of the groundwater resources, stage of extraction and distribution of OCS assessment units in 26 States/UT as per GWRA 2023.
 - B) Artificial Recharge and Water Conservation Projects constructed for the purpose of sustainable groundwater management
 - C) National Aquifer Mapping and Management Programme (NAQUIM) for sustainability of aquifers.
3. Further matter was listed on 09.02.2024 wherein Hon'ble Tribunal directed CGWA to file supplementary report to bring the guidelines to regulate issue of permission/NOC for extraction of ground water in stressed area on record. In pursuance to the direction of Hon'ble Tribunal, CGWA filed supplementary report on 21.03.2024.



4. In pursuance to the directions issued by the Hon'ble Tribunal vide order dated 26.07.2024, effective steps taken, being taken or proposed to be taken for management and regulation of ground water across the country are enumerated below.

(A) Ground Water Level Monitoring:

Central Ground Water Board (CGWB) monitors ground water levels on a regional scale through a network of nearly 27,000 monitoring wells (as on 31st March, 2024) spread over the entire country. Ground water levels are monitored four times a year during the months of January, April/ May, August and November. State wise details of water level monitoring stations is annexed herein as **Annexure-I**.

Data of ground water levels are shared through India WRIS portal. After each monitoring exercise, ground water bulletins are issued at State and National Level. Consolidated reports of ground water level monitoring are issued in the form of ground water yearbooks for the States as well as for the entire country. Ground Water Bulletins and Yearbooks are shared with State Governments and other stakeholders. Copy of groundwater Year book 2022-23 is annexed herein as **Annexure-II**.

Proposed Action to be taken in Future:

CGWB has now initiated strengthening of groundwater monitoring network and automation of ground water level monitoring by equipping these monitoring stations with Digital Water Level Recorders (DWLR) with telemetry systems.

- i. Under National Hydrology Project (NHP), CGWB has installed nearly 5000 DWLRs with telemetry system.
- ii. Under the ongoing Public Investment Board (PIB) approved NAQUIM project, CGWB has a target of construction of 7000 piezometers (ground water level monitoring wells) for strengthening of ground water monitoring. It is also targeted to install DWLRs in all these 7000



piezometers. These digital water level recorders will be fitted with telemetry systems for direct transfer of water level data from the field to a central server.

(B) Assessment of Ground Water Resources:

Sustainable development of ground water resources requires precise quantitative assessment based on valid scientific principles. The Dynamic Ground Water Resources of India is periodically assessed by Central Ground Water Board (CGWB) jointly with the State / UT level agencies. This exercise comprises assessment of Annual Ground Water Recharge, Extractable Ground Water Resource, Ground Water Extraction, Stage of ground water extraction (the ratio of annual ground water extraction to annual extractable resource) in an assessment unit.

Starting from the year 2022, CGWB has transitioned the groundwater assessment process to an **annual basis**, aiming to improve monitoring and expedite response efforts.

A **Software**, INDIA-Groundwater Resource Estimation System (**IN-GRES**) has been developed for a faster and automated assessment process. This has reduced the time required for assessment drastically and the assessment reports are published on a yearly basis.

The Report on "**National Compilation of Dynamic Ground Water Resources, 2023**" has been issued and is available on CGWB website (<https://cgwb.gov.in/cgwbpm/publication-detail/1141>). Assessment for the year 2024 has already been initiated.

(C) Ground Water Quality Monitoring:

Central Ground Water Board (CGWB) carries out ground water quality monitoring on a regional scale. Sampling for ground water quality monitoring is done through a network of nearly 19,000 wells (**Annexure-III**). CGWB has 16 well-equipped chemical laboratories, 12 of which are NABL accredited. CGWB has recently introduced SoP for Ground Water Quality Monitoring



with varying sampling frequency including higher frequency and higher density in hotspot/vulnerable areas. This new SoP is being implemented from 2023.

Based on results of analysis, fortnightly ground water quality alerts are issued at State and National Levels. These alerts are shared with ground water/drinking water/ PHED departments of the concerned states and district administrations. Findings are also shared through ground water quality bulletins. Annual report on ground water quality is released as ground water quality year book every year. Ground Water Quality alert sample and Ground Water Quality Year Book-2022-23 are annexed herein as **Annexure-IV** & **Annexure-V** respectively.

For monitoring of saline water ingress in coastal areas, 60 piezometers with automatic probes for high frequency measurement of groundwater salinity (EC) have been installed in the coastal areas of Tamil Nadu and Puducherry.

Proposed Action to be taken in Future:

84 piezometers with water quality probe are being installed in the coastal areas of Andhra Pradesh (22), Gujarat (12), Odisha (5), Tamil Nadu (30) and West Bengal (15).

(D) Construction of Arsenic-safe and Fluoride-free wells:

(E) Aquifer Mapping:

National Aquifer Mapping and Management (NAQUIM 1.0) Programme was initiated in 2012 as a part of the ground water management and regulation scheme with the objectives to delineate and characterize the aquifers and develop plans for ground water management. Aquifer maps have been prepared and management plans have been developed for the entire mappable area of about 25 lakh km². These management plans include demand-side management and supply-side management.

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A multi-tiered approach is adopted for sharing of outputs of NAQUIM studies. The findings are shared with the state government through State Ground Water Coordination Committees (SGWCC). Reports have also been shared with the District Authorities (DM/DC). Further, Public Interaction Programs (PIP) are being organized at grassroots level for disseminating the outputs of NAQUIM Studies. The outputs are also shared through websites and regional workshops.

The finding and recommendations of NAQUIM studies are being used by various agencies for planning interventions for artificial recharge, regulation of ground water extraction, construction of contaminant free wells, construction of irrigation wells in feasible areas etc.

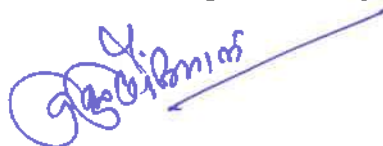
Proposed Action to be taken in Future:

Taking the programme forward, CGWB has initiated **NAQUIM 2.0** studies from **2023** onwards for detailed mapping in identified priority areas like water-stressed areas, areas affected with ground water contamination, coastal areas, urban agglomerates, spring-sheds, industrial clusters etc. **NAQUIM 2.0** studies are proposed as **issue-specific** and will be undertaken in **prioritized focus areas identified in consultation with State Government agencies**. The **Tool Kit** consisting of set of operational guidelines for the officers involved in planning and execution of NAQUIM 2.0 studies is attached as **Annexure-VI**.

Reports of NAQUIM 2.0 studies shall be shared with States/UTs, as well as District Authorities. Copy of the reports shall also be forwarded by **Central Ground Water Authority** to the concerned State/ UT and DM/ DC to **implement measures** recommended in the report to address the specific groundwater issues in their respective areas.

(F) High Resolution Aquifer Mapping:

Heli-borne geophysical surveys adopting Transient Electromagnetic Methods have been carried out by CGWB in collaboration with CSIR-NGRI for high resolution mapping of aquifers in the arid areas in parts of Rajasthan, Gujarat



and Haryana. So far detailed information in respect of nearly 1 lakh sq km has already been generated.

Proposed Action to be taken in Future:

It is proposed to cover nearly 3 lakh sq km additional area in the near future. This information will help in developing more effective groundwater management plans, particularly identification of potential recharge zones on village level.

(G) Preparation of Master Plan for artificial Recharge to Groundwater:

CGWB jointly with the respective State counterparts has prepared a Master Plan for Artificial Recharge in the country. The master plan is a macro plan, formulated to work out the feasibility of various structures for the different terrain conditions of the country covering both rural as well as urban areas. Under this Master plan an area of 11.23 lakh sq. km has been identified and a total of 1,41,75,144 number of different structures have been envisaged for rainwater harvesting and artificial recharge which are expected to harvest/recharge 573.35 BCM of water.

(H) Artificial Recharge Interventions:

CGWB implements artificial recharge interventions to demonstrate their feasibility and effectiveness. So far 4485 structures have been constructed. List is enclosed as **Annexure-VII**.

Recently, innovative recharge structures on cluster-based approach based on findings of Aquifer Mapping studies are being implemented. These Projects are being implemented in coordination with State Government/ Institutions/ identified PSUs. Such projects have already been implemented in three

Signature of

aspirational districts, one each in the states of Maharashtra, Andhra Pradesh and Telangana.

CGWB has also implemented project for construction of **Bridge-cum-Bandhara (BCB)** in parts of Maharashtra. Bridge-cum Bandhara (BCB) is a water conservation structure that serves the dual purpose of transportation and artificial recharge through storage of water in the upstream side of an existing bridge. Five BCB projects were implemented under tripartite agreement between CGWB, WAPCOS and the Government of Maharashtra.

CGWB is providing technical guidance in selection of sites, design of artificial recharge structures and capacity building of MGNREGS officials in select 09 Blocks of 08 States of Andhra Pradesh, Telangana, Karnataka, Tamil Nadu, Rajasthan (2 blocks), Haryana, Madhya Pradesh and Maharashtra.

Recently, CGWB has taken up artificial recharge for water conservation and groundwater augmentation in water-stressed areas of Jaisalmer, Jodhpur, Barmer, Alwar, Jhunjhunu and Sikar districts of **Rajasthan**. Innovative recharge structures like combination of check dams, anicuts and ponds with recharge shafts are being constructed and the project is under implementation.

These projects will also serve as sites for field research and training on efficacy of different types of artificial recharge structures in different geological terrains.

Proposed Action to be taken in Future:

Findings of high-resolution mapping by heli-borne surveys are being used for identification of areas for planning and implementation of large-scale Artificial Recharge projects.

(I) Atal Bhujal Yojana:

Atal Bhujal Yojana (Atal Jal) is a scheme being implemented by Ministry of Jal Shakti with the objective to improve ground water management through participatory approach with a **focus on demand management** and behavioral



changes. The Scheme focuses on **community participation** by strengthening institutional mechanism **and demand side interventions** for sustainable ground water management in identified water stressed areas and expected to contribute significantly towards the water and food security of the participating States.

The Scheme has been taken up for implementation in 8203 water stressed Gram Panchayats of the country, spread over 229 administrative blocks/ Talukas in 80 districts of seven states, viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

Proposed Action to be taken in Future:

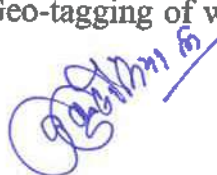
Government is examining the scope for **further expansion of the scheme in other States.**

(J) National Interdepartmental Steering Committee (NISC):

Ministry of Jal Shakti has reconstituted the National Interdepartmental Steering Committee (NISC) in 2024, headed by Secretary (WR, RD & GR). ToR of the Committee includes Management of overall water resources including groundwater. The **Committee has members from allied Central Ministries like Agriculture and Farmers' Welfare, Housing and Urban Affairs etc.** It also has representatives from State Governments.

(K) Jal Shakti Abhiyan:

Jal Shakti Abhiyan is being implemented by Ministry of Jal Shakti for expediting groundwater conservation interventions. As part of Jal Shakti Abhiyan the States are being pursued to adopt and expedite Rainwater Harvesting and other interventions. The Jal Shakti Abhiyan – Catch the Rain (JSA-CTR) campaign, 2024 will focus on following interventions/ activities: (i) de-silting and cleaning of water bodies; (ii) revitalizing abandoned/ defunct borewells for groundwater recharge; (iii) Geo-tagging of water bodies coupled



with meticulous mapping and regular updates in the states revenue records; (iv) Intensified afforestation efforts in the catchment areas of water bodies; (v) Snow harvesting in hilly areas like stupas in Ladakh for conserving water; (vi) rejuvenation of small rivers; (vii) Spring shed development; (viii) protection of water catchment areas; (ix) removal of encroachment in water bodies and their renovation; (x) source protection works and; (xi) rejuvenation of small rivers and rivulets.

For effective implementation of Abhiyan, **technical guidance and support** are provided by **CGWB** and its Officers.

(L) Capacity Building, Outreach and Awards:

For training and capacity building, an institute Rajiv Gandhi National Ground Water Training and Research Institute (RGNGWTRI) dedicated to groundwater has been established in Raipur, Chhattisgarh. The institute has all the modern facilities for training and research. Since 2012, RGNGWTRI has been implementing a three-tiered (Tier I- National Level, Tier II- State/District Tier -III: Block Level) training programme. The institute conducts nearly 120 training programmes a year.

Public Interaction Programs (PIPs) were initiated in the year 2018 as a medium to disseminate findings of NAQUIM and other studies at grassroots level. So far, a total of 1429 such programmes have been conducted in which nearly 1.26 lakh people have participated. State wise summary of Public Interaction Programmes (PIP) organized and number of participants during 2018 to 31st March 2024 is annexed herein as **Annexure-VIII**. The participants were sensitized on various aspects of water conservation, ground water management and findings of the NAQUIM and other studies.

In order to incentivize initiatives for water conservation including ground water conservation Ministry of Jal Shakti introduced National Water Awards in 2019. The Awards are given at all levels to incentivize the efforts. The categories for award include 'Best State', 'Best District', 'Best Village Panchayat', 'Best



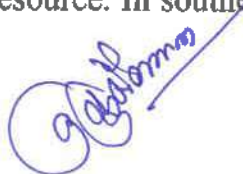
Urban Local Body', 'Best School/College', 'Best Institution (other than school/college)', 'Best Industry', 'Best Civil Society', 'Best Water User Association', 'Best Industry', and 'Best Individual for excellence'. So far, awards have been given to **278 individuals/ organisations/ administrative units** in four editions of NWA. List of awardees is enclosed as **Annexure-IX**. Currently, fifth edition of the National Water Awards is under process.

(M) Directions to States by Central Ground Water Authority (CGWA):

Ministry of Jal Shakti and Central Ground Water Authority have earlier written DOs to the States/ UTs, urging them to adopt MoJS guidelines. These letters are enclosed as **Annexure-X**. Further, the Chairman, CGWA took meeting of SGWAs/ Departments in January, 2022 and June, 2022, wherein States/ UTs were advised to adopt MoJS guidelines. The Secretary, DoWR, MoJS took meeting of all States on 05.04.2023, advising them to adopt MoJS guidelines. In June, 2024 and August, 2024, the Chairman took meeting of all State Ground Water Authorities, wherein the State Authorities were urged to expedite adoption of MoJS guidelines.

The Chairman, CGWA, exercising the power vested under Section 5 of EPA, 1986, has issued directions vide letter dated 09.09.2024 to the Authorities/ Department(s) regulating groundwater management and development in the State/ UT to incorporate suitable additions/ modifications in the respective Provincial Act/ Rules in line with CGWA guidelines dated 24.09.2020 and subsequent amendment dated 29.03.2023 thereto. Further, States/UTs have also been directed to submit compliance report within three months. Copy of letters are enclosed as **Annexure-XI**.

5. The rate of extraction is higher than safe norms in some of the states, such as northwestern, western and southern parts of the country. In western parts (particularly Rajasthan and Gujarat), the arid climate limits groundwater recharge, leading to stress on the resource. In southern parts, the ground water

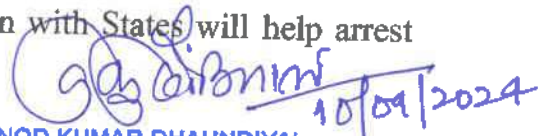


availability is low due to inherent characteristics of crystalline aquifers. At the same time, in some of the areas, good continuous rainfall and management practices like ground water augmentation and conservation measures through government and private initiatives have resulted in improvement in ground water situation.

6. Although it is admitted that the rate of extraction is higher than safe norms in some of the states, it is sincerely hoped that the steps taken by CGWA, as well as the actions proposed for future in coordination with States will help arrest the decline further and restore the situation.

FILED BY:-

Through


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DATED 10.09.2024


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Annexure I

State-wise status of groundwater level monitoring Stations as on March 2024

S. N.	State/UT	Groundwater Level Monitoring Stations (numbers)				
		Dug Well	Piezometer	Hand Pump	Spring	Total
1	Andhra Pradesh	676	797			1473
2	Arunachal Pradesh	26	6			32
3	Assam	355	80	8		443
4	Bihar	796	120			916
5	Chhattisgarh	1044	269	5		1318
6	Goa	83	52			135
7	Gujarat	789	504			1293
8	Haryana	478	819			1297
9	Himachal Pradesh	138	55		24	217
10	Jharkhand	460	122			582
11	Karnataka	1360	931			2291
12	Kerala	1330	296		24	1650
13	Madhya Pradesh	1386	485			1871
14	Maharashtra	1779	296			2075
15	Manipur	4			2	6
16	Meghalaya	67	13		19	99
17	Mizoram	3				3
18	Nagaland	99	1		28	128
19	Odisha	1507	277			1784
20	Punjab	175	995			1170
21	Rajasthan	642	660			1302
22	Sikkim	0	4			4
23	Tamil Nadu	743	694			1437
24	Telangana	273	1008			1281
25	Tripura	97	18			115
26	Uttar Pradesh	978	486			1464
27	Uttarakhand	39	12	149	79	279
28	West Bengal	695	286	751		1732
	UTs					
1	Andaman & Nicobar	111	2			113
2	Chandigarh	1	22			23
3	Daman & Diu and Dadra & Nagar Haveli	38	5			43
4	Delhi	22	113			135
5	Jammu and Kashmir	313	106		6	425
6	Ladakh					
7	Puducherry	9	18			27
	Total	16516	9552	913	182	27163



Ground Water Year Book - India 2022-2023

Central Ground Water Board
Ministry of Jal Shakti
Department of Water Resources,
River Development and Ganga Rejuvenation
Government of India

Ground Water Year Book – India 2022-2023

Central Ground Water Board

Ministry of Jal Shakti

Department of Water Resources, River
Development and Ganga Rejuvenation
Government of India

देवश्री मुखर्जी
Debashree Mukherjee
सचिव
SECRETARY



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION



MESSAGE

Groundwater serves as the backbone of India's economy by providing a significant portion of water for agricultural and industrial activities. However, global warming and climate change have disrupted rainfall patterns, leading to instances of water scarcity worldwide and placing greater stress on groundwater resources, particularly in countries like India.

The uncontrolled extraction of groundwater has resulted in a widespread decline in water levels across many states over the past few decades. Consequently, the focus of groundwater stakeholders and policymakers has shifted from mere development to comprehensive management strategies.

The groundwater level serves as a vital indicator of the balance between recharge and extraction within the groundwater system. Any fluctuations in this balance are swiftly reflected in the rise or fall of water levels. Thus, effective groundwater management necessitates the establishment of a robust database for groundwater level data. Systematic and periodic monitoring of water levels constitutes the fundamental step in addressing issues related to groundwater scarcity.

Numerous central and state agencies have been engaged in monitoring groundwater levels throughout the country for many years. The Central Ground Water Board (CGWB), the apex central government department in the groundwater sector, has been monitoring water levels nationwide since the 1970s. Currently, the CGWB operates a network comprising approximately 25,000 groundwater level monitoring stations, where water levels are monitored four times a year. The data generated through such monitoring schemes is invaluable for academicians, groundwater planners, and other stakeholders, facilitating research, scientific studies, resource estimation, groundwater modeling, and the formulation of management and regulatory plans, including artificial recharge initiatives.

I commend the CGWB for its commendable efforts in publishing the "Groundwater Year Book-India 2022-2023," an annual compilation providing insights into water levels and their dynamics across different aquifers nationwide, along with state-wise scenarios of groundwater regimes. I am confident that this report will prove immensely beneficial to all stakeholders involved in the management and conservation of groundwater resources.

(Debashree Mukherjee)

डॉ. सुनील कुमार अम्बष्ट
अध्यक्ष
Dr. Sunil Kumar Ambast
Chairman



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भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन,
नदी विकास और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल बोर्ड
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Board

FOREWORD

The hydrologic cycle involves the continuous circulation of water in the Earth-Atmosphere system. As part of hydrologic cycle, water infiltrate into soil and percolates to become a part of groundwater system. This groundwater is a critical natural resource, invisible but indispensable for life on our planet. Groundwater is extremely important to meet the rapidly expanding drinking, agricultural and industrial water requirement of the country. Groundwater is central to food and water security, fight against poverty, socio-economic development, and to the resilience of societies and economies to climate change. Reliance on groundwater will only increase mainly due to growing water demand by all sectors combined with increasing variation in rainfall patterns.

The changes in water levels are result of the rainfall, development pattern of the groundwater resources for irrigation and drinking water needs. Analyses of groundwater level fluctuations are aimed at observing seasonal, annual and decadal variations in groundwater levels. Therefore, the periodic and accurate monitoring of the groundwater levels both in time and space are the main pre-requisites for assessment, scientific development and planning of this vital resource. To keep track of the changes in groundwater regime, Central Ground Water Board monitors groundwater levels four times in a year i.e., January, March/April/May, August and November through a network of groundwater monitoring wells scattered throughout the length and breadth of the country.

I hope Ground Water Year Book will be of immense help to various user agencies as well as stakeholders for planning and management of groundwater resources. These data will also be helpful to the planners, technocrats, researchers, academic institutes, etc. for the formulation of various groundwater-based schemes in the country. Last but not the least, I appreciate the work done by Shri. D. N, Mandal, Dr. Gajanan Ramteke, Shri. Rajesh Kumar, Shri Ajit Singh and Mrs. Poonam Panchal in the compilation of data and preparation of this report.

(Dr. Sunil Kumar Ambast)
Chairman

Faridabad

सुबोध यादव
संयुक्त सचिव
Subodh Yadav
Joint Secretary



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

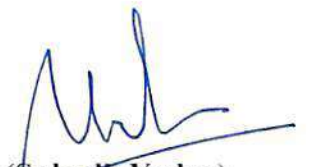
MESSAGE

Groundwater is a vital source for the agricultural, industrial, social development of the country, and playing a significant role in the financial growth of the nation. Approximately 65% of irrigation and 85% of the drinking water supply in the country depend on groundwater resources. However, the issue of excessive groundwater withdrawal compared to annual replenishment and as a result, decline in water level has become a growing concern in many areas. Managing this precious resource for the development of the country and future generations is one of the prime objectives of the Government.

Groundwater level is the cardinal response of the aquifer. In India, the groundwater level is monitored by the Central Ground Water Board through fixed monitoring stations at regular time intervals. These monitoring stations are strategically distributed spatially and in-depth to capture a snapshot of aquifer's behaviours. The water level data thus generated is utilized for estimating groundwater resources, assessing short and long-term changes in hydro geological systems, aquifer desaturation studies, numerical modelling, predicting future scenarios, and prioritizing areas for effective groundwater management and regulatory measures.

The report "Groundwater Year Book-India 2022-2023" includes the analysis and interpretation of water level data from about 25,000 monitoring stations across the country, which are monitored four times a year by CGWB. This report shows that the nearly 87% of the groundwater monitoring stations have water level less than 10 meters in post monsoon of year 2022 and 60% wells show rise in water compared to their decadal mean.

The report includes depth-to-water levels in various seasons, along with seasonal and decadal fluctuations and the State/District-wise rise and fall of the monitoring stations will provide stakeholders, policymakers, regulators, and researchers with insights into the groundwater situation in the desired area. I would like to congratulate the efforts made by CGWB in publishing such a report. I hope this report will be instrumental in the management of the groundwater resources of the country.


(Subodh Yadav)



अनुराग खन्ना
सदस्य
Anurag Khanna
Member



1583



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन,
नदी विकास और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल बोर्ड
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Board

PREFACE

The National Ground Water Regime Monitoring Programme has become one of the most important and frontal activities of the Central Ground Water Board. The monitoring programme was initiated in a small way in 1969 by establishing one station per Degree Sheet and has been continuously strengthened ever since, with a view to create a high-density regional network so as to obtain the comprehensive scenario of groundwater regime. Presently, Central Ground Water Board has about 25000 monitoring stations throughout the country. High priority is accorded for accomplishing the measurements within the stipulated time during each monitoring schedule.

Central Ground Water Board monitors groundwater levels four times in a year i.e., during January, March/April/May, August and November through a network of National Hydrographic Network Stations (NHNS) for effective planning and management of the water resource. The data collected from monitoring wells for each monitoring schedule is compiled, processed and the salient features are brought out as a "Ground Water Year Book" issued once in a groundwater year depicting temporal as well as spatial changes in groundwater regime during the preceding year.

This report pertains to the groundwater regime scenario in the country for the year 2022-2023. It gives an overview of the status of groundwater levels monitored, seasonal and annual water level fluctuations, long term changes in groundwater levels.

The sincere efforts made by Shri. D. N. Mandal, Dr. Gajanan Ramteke, Shri. Rajesh Kumar, Shri Ajit Singh and Mrs. Poonam Panchal in the compilation of data and preparation of this report in the present form are highly appreciable.

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GROUNDWATER YEAR BOOK INDIA 2022-2023

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1. HYDROGEOLOGICAL SETUP OF THE COUNTRY

1.1 GROUNDWATER OCCURRENCE

The groundwater behavior in the Indian sub-continent is highly complicated due to the occurrence of diversified geological formations with considerable lithological and chronological variations, complex tectonic framework, climatological dissimilarities and various hydrochemical conditions. Studies carried out over the years have revealed that aquifer groups in alluvial / soft rocks even transcend the surface basin boundaries. Broadly two groups of rock formations have been identified depending on characteristically different hydraulics of groundwater, Viz. Porous Formations and Fissured Formations.

1.1.1 POROUS FORMATION

Porous formations have been further subdivided into Unconsolidated and Semi-consolidated formations.

UNCONSOLIDATED FORMATIONS

The areas covered by alluvial sediments of river basins, coastal and deltaic tracts constitute the unconsolidated formations. These are by far the most significant groundwater reservoirs for large scale and extensive development. The hydrogeological environment and groundwater regime in the Indo-Ganga-Brahmaputra basin indicate the existence of potential aquifers having enormous fresh groundwater reserve. Bestowed with high incidence of rainfall and covered by a thick pile of porous sediments, these groundwater reservoirs get replenished every year and are being used heavily. In these areas, in addition to the Annual Replenishable Groundwater Resources available in the zone of water level fluctuation (Dynamic Groundwater Resource), there exists a huge groundwater reserve in the deeper passive recharge zone below the zone of fluctuation as well as in the deeper confined aquifers which remains largely unexplored as yet. Although the mode of development of groundwater is primarily through dug wells, dug cum bore well and cavity wells, thousands of tube wells have been constructed during last few decades.

SEMI-CONSOLIDATED FORMATIONS

The semi-consolidated formations normally occur in narrow valleys or structurally faulted basins. The Gondwanas, Lathis, Tipams, Cuddalore sandstones and their equivalents are the most extensive productive aquifers in this category. Under favorable situations, these formations give rise to free-flowing wells. In selected tracts of northeastern India, these

water-bearing formations are quite productive. The Upper Gondwanas, which are generally arenaceous, in general, constitute prolific aquifers.

1.1.2 FISSURED FORMATIONS (CONSOLIDATED FORMATIONS)

The consolidated formations occupy almost two-thirds of the country. These formations, except vesicular volcanic rocks have negligible primary porosity. From the hydrogeological point of view, fissured rocks are broadly classified into four types viz. Igneous and metamorphic rocks (excluding volcanic and carbonate rocks), volcanic rocks, consolidated sedimentary rocks and Carbonate rocks.

IGNEOUS AND METAMORPHIC ROCKS EXCLUDING VOLCANIC AND CARBONATE ROCKS

The most common rock types under this category are granites, gneisses, charnockites, khondalites, quartzites, schists and associated phyllites, slates, etc. These rocks possess negligible primary porosity but attain porosity and permeability due to fracturing and weathering. Groundwater yield also depends on the rock type and grade of metamorphism. Generally, the granites, Khondalites and biotite gneisses have better yield potential as compared to charnockites.

VOLCANIC ROCKS

The predominant types of volcanic rocks are the basaltic lava flows of Deccan Plateau. The highly variable water bearing properties of different flow units control groundwater occurrence in Deccan Traps. The Deccan Traps have usually poor to moderate permeability depending on the presence of primary and secondary fractures.

CONSOLIDATED SEDIMENTARY ROCKS EXCLUDING CARBONATE ROCKS

Consolidated sedimentary rocks occur in Cuddapahs, Vindhyan and their equivalents. The formations consist of conglomerates, sandstones, shales. The presence of bedding planes, joints, contact zones and fractures controls the groundwater occurrence, movement and yield potential.

CARBONATE ROCKS

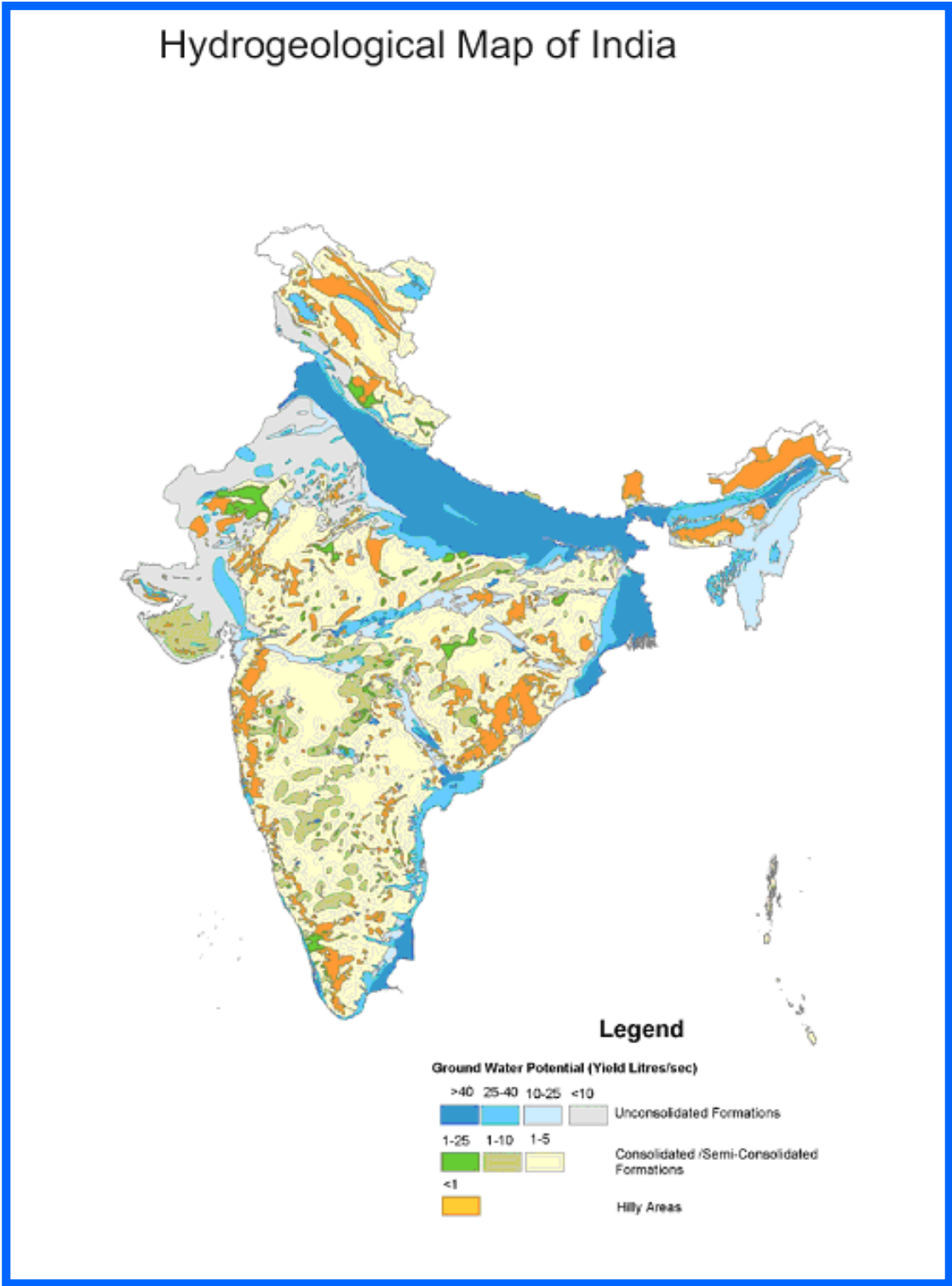
Limestones in the Cuddapah, Vindhyan and Bijawar group of rocks dominates the carbonate rocks other than marbles and dolomites. In carbonate rocks, the circulation of water creates solution cavities thereby increasing the permeability of the aquifers. The solution activity leads to widely contrasting permeabilities within short distances.

1.2 HYDROGEOLOGICAL UNITS AND THEIR GROUNDWATER POTENTIAL

Hydrogeological map of India is depicted in **Plate-I** and the geographical distribution of hydrogeological units along with their Groundwater potential is given in **Table- 1**.

TABLE-1: AQUIFER SYSTEM IN THE COUNTRY

System	Coverage	Groundwater potential
Unconsolidated formations - alluvial	Indo-Gangetic, Brahmaputra plains	Enormous reserves down to 600 m depth. High rain fall and hence recharge is ensured. Can support large-scale development through deep tube wells
	Coastal Areas	Reasonably extensive aquifers but risk of saline water intrusion
	Part of Desert area – Rajasthan and Gujarat	Scanty rainfall. Negligible recharge. Salinity hazards. Groundwater Availability at great depths.
Consolidated/semi-consolidated formations - sedimentaries, basalts and crystalline rocks	Peninsular Areas	Availability depends on secondary porosity developed due to weathering, fracturing etc. Scope for GW availability at shallow depths (20-40 m) in some areas and deeper depths (100-200 m) in other areas. Varying yields.
Hilly	Hilly states	Low storage capacity due to quick runoff



2. RAINFALL VARIATIONS

Variability in the onset, withdrawal and quantum of rainfall during the monsoon season has profound impacts on water resources, power generation, agriculture, economics and ecosystems in the country. The variation in climate is perhaps greater than any other area of similar size in the world. There is a large variation in the amounts of rainfall received at different locations. The average annual rainfall is about 122 cm, but it has great spatial variations. The areas on the Western Ghats and the Sub-Himalayan areas in North East and Meghalaya Hills receive heavy rainfall of over 250 cm annually, whereas the Areas of Northern parts of Kashmir and Western Rajasthan receive rainfall less than 40 cm. The rainfall pattern roughly reflects the different climate regimes of the country, which vary from humid in the northeast (about 180 days rainfall in a year), to arid in Rajasthan (20 days rainfall in a year). Due to climatic changes, in recent times, the occurrence of high intensity rainfall event has increased and the number of rainy days has decreased. In some years, it has been observed that, the southwest monsoon has extended beyond its normal withdrawal date.

Normal Annual Rainfall

The rainfall over India has large spatial as well as temporal variability. Annual rainfall is more than 200 cm over these regions. For the country as whole, mean monthly rainfall during July (301 mm) is highest and contributes about 24.6% of annual rainfall (1219.77 mm). The mean rainfall during August is slightly lower and contributes about 21.9% of annual rainfall. June and September rainfall are almost similar and contribute 13.8% and 14.5% of annual rainfall, respectively. The mean southwest monsoon (June, July, August & September) rainfall (914 mm) contributes 75.5% of annual rainfall (1219.77 mm). Contribution of pre-monsoon (March, April & May) rainfall and post-monsoon (October, November & December) rainfall in annual rainfall is mostly the same (11%). Coefficient of variation is higher during the months of November, December, January and February. The Thematic map of distribution of annual normal rainfall is given in **Plate-II**. The map shows that, one state i.e., Rajasthan receives annual rainfall between 250 – 500 mm, 9 states and UTs between 500 mm – 1000 mm, 15 states between 1000 – 2000 mm, 4 states between 2000-3000 mm and 5 states more than 3000 mm in a year.

Normal Monsoon Rainfall

The SW monsoon is the most significant feature of the Indian climate. The season is spread over four months, but the actual period at a particular place depends on onset and withdrawal

dates. It varies from less than 75 days over West Rajasthan, to more than 120 days over the south-western regions of the country contributing to about 75% of the annual rainfall. The onset of the SW monsoon normally starts over the Kerala coast, the southern tip of the country by 1 June, advances along the Konkan coast in early June and covers the whole country by middle of July. However, onset occurs 42 about a week earlier over islands in the Bay of Bengal. The monsoon is influenced by global and local phenomenon like El Nino, northern hemispheric temperatures, sea surface temperatures, snow cover etc. Normal monsoon rainfall more than 1500 mm is being observed over most parts of northeast India, Konkan & Goa. It ranges from 317 mm in Tamil Nadu state to 6218 mm in Meghalaya state with an average of 914.46 mm.

Normal Post-monsoon rainfall

North-East (NE) monsoon or post-monsoon season is transition season associated with the establishment of the north-easterly wind regime over the Indian subcontinent. Meteorological subdivisions namely Coastal Andhra Pradesh Rayalaseema, Tamil Nadu, Kerala and South Interior Karnataka receive good amount of rainfall accounting for about 35% of their annual total in these months. Many parts of Tamil Nadu and some parts of Andhra Pradesh and Karnataka receive rainfall during this season due to the storms forming in the Bay of Bengal. It ranges from 18 mm in Rajasthan state to 910 mm in Puducherry UT with an average of 200 mm. In the north eastern states, it ranges from it ranges from 169 mm to 315 mm with an average of 239 mm.

Rainfall Variation in 2022

The distribution of annual rainfall in 2022 is given as thematic map in **Plate III**. The map shows that Ladakh received annual rainfall less than 500 mm, 7 states between 500 mm – 1000 mm, 19 states between 1000 – 2000 mm, 4 states between 2000-3000 mm and 4 states more than 3000 mm. State-wise seasonal and annual observed rainfall, and its percentage departure from normal rainfall is given in **Table 2**. This data is based on India-WRIS, IMD Gridded Data. It may be observed that during 2022, highest rainfall of 5176 mm was received at Meghalaya state and the lowest rainfall of 366.85 mm was received at Ladakh state. However, on comparing with normal rainfall, it may be seen that, Daman & Diu has the highest positive departure of 301% from its normal whereas Meghalaya is with highest negative departure of 35.32% from its normal rainfall. Negative departure from normal

annual rainfall is observed in 15 states. The national average rainfall is 1243.84 mm with a positive departure of 1.97% from normal.

TABLE 2: STATE-WISE SEASONAL AND ANNUAL RAINFALL DISTRIBUTION (Source: IMD Gridded Data, IndiaWRIS)

STATE	Non-Monsoon Period				Monsoon Period				Cumulative (Annual)		
	Actual (mm)	Normal (mm)	Deviation (mm)	Percentage of Non-Monsoon Rainfall from Annual	Actual (mm)	Normal (mm)	Deviation (mm)	Percentage of Monsoon Rainfall from Annual	Actual (mm)	Normal (mm)	Deviation (mm)
Andaman & Nicobar	--	1461.72	--	--	--	1447.72	--	--	--	2909.44	--
Andhra Pradesh	487.17	377.42	29.08	45.91	573.98	492.12	16.63	54.09	1061.15	869.54	22.04
Arunachal Pradesh	1457.9	1066.08	36.75	50.83	1410.48	1935.05	-27.11	49.17	2868.38	3001.13	-4.42
Assam	999.39	830.39	20.35	42.60	1346.74	1442.1	-6.61	57.40	2346.13	2272.49	3.24
Bihar	239.48	187.98	27.40	24.60	734.12	1034.27	-29.02	75.40	973.6	1222.25	-20.34
Chandigarh	317.1	231.1	37.21	26.21	892.7	846.6	5.45	73.79	1209.8	1077.7	12.26
Chhattisgarh	163.0	160	1.88	11.91	1205.65	1140.08	5.75	88.09	1368.65	1300.08	5.27
Dadra And Nagar Hav	129.57	--	--	3.73	3344.38	--	--	96.27	3473.95	--	--
Daman & Diu	47.05	50.8	-7.38	1.88	2459.46	574.2	328.33	98.12	2506.51	625	301.04
Delhi	243.35	126.9	91.77	36.40	425.23	667.1	-36.26	63.60	668.58	794	-15.80
Goa	350.58	271.3	29.22	10.01	3152.78	2773.9	13.66	89.99	3503.36	3045.2	15.05
Gujarat	23.2	38.21	-39.28	2.54	890.01	672.68	32.31	97.46	913.21	710.89	28.46
Haryana	177.5	97.92	81.27	26.15	501.16	460.09	8.93	73.85	678.66	558.01	21.62
Himachal Pradesh	370.5	550.45	-32.69	33.25	743.9	772.36	-3.68	66.75	1114.4	1322.81	-15.76
Jammu & Kashmir	507.91	648.47	-21.68	44.96	621.75	552.99	12.43	55.04	1129.66	1201.46	-5.98
Jharkhand	247.27	230.5	7.28	24.02	782.01	1095.08	-28.59	75.98	1029.28	1325.58	-22.35
Karnataka	485.37	319.73	51.81	33.36	969.45	896.12	8.18	66.64	1454.82	1215.85	19.65
Kerala	1060.37	956.38	10.87	38.71	1678.94	2140.62	-21.57	61.29	2739.31	3097	-11.55
Ladakh	170.85	--	--	46.57	196	--	--	53.43	366.85	--	--
Madhya Pradesh	139.64	105.23	32.70	10.74	1160.56	996.91	16.42	89.26	1300.2	1102.14	17.97
Maharashtra	159.84	141.56	12.91	11.78	1196.67	1001.6	19.48	88.22	1356.51	1143.16	18.66
Manipur	659.73	527.35	25.10	45.50	790.36	841.25	-6.05	54.50	1450.09	1368.6	5.95
Meghalaya	2257.63	1786.3	26.39	43.61	2919.36	6218.27	-53.05	56.39	5176.99	8004.57	-35.32
Mizoram	653.27	833.1	-21.59	33.12	1319.13	1345.1	-1.93	66.88	1972.4	2178.2	-9.45
Nagaland	606.42	559.82	8.32	37.80	997.77	1341.8	-25.64	62.20	1604.19	1901.62	-15.64
Odisha	291.03	310.48	-6.26	20.68	1116.44	1159.49	-3.71	79.32	1407.47	1469.97	-4.25

Pondicherry	897.92	1036.5	-13.37	70.29	379.46	326.7	16.15	29.71	1277.38	1363.2	-6.30
Punjab	190.93	145.71	31.03	27.63	500.07	500.42	-0.07	72.37	691	646.13	6.94
Rajasthan	68.56	43.35	58.15	10.80	566.09	418.13	35.39	89.20	634.65	461.48	37.52
Sikkim	1344.21	1066.6	26.03	37.35	2254.76	2023.9	11.41	62.65	3598.97	3090.5	16.45
Tamil Nadu	675.15	605.59	11.49	60.11	447.95	316.35	41.60	39.89	1123.1	921.94	21.82
Telangana	207.63	175.51	18.30	15.72	1113.11	766.95	45.13	84.28	1320.74	942.46	40.14
Tripura	818.74	882.88	-7.26	41.32	1162.74	1478.47	-21.36	58.68	1981.48	2361.35	-16.09
Uttar Pradesh	245.49	124.02	97.94	29.45	587.96	856.79	-31.38	70.55	833.45	980.81	-15.02
Uttarakhand	396.61	357.19	11.04	24.97	1191.58	1212.52	-1.73	75.03	1588.19	1569.71	1.18
West Bengal	447.83	397.04	12.79	29.13	1089.36	1342.21	-18.84	70.87	1537.19	1739.25	-11.62
INDIA	343.84	305.32	12.62	27.64	900	914.46	-1.58	72.36	1243.84	1219.78	1.97

It may be observed from the data that the variation of southwest monsoon rainfall is very high and it ranges from 196 mm in Ladakh to 3344.38 mm in Dadra and Nagar Haveli. The states of Andhra Pradesh, Daman & Diu, Goa, Gujarat, Jammu & Kashmir, Madhya Pradesh, Maharashtra, Pondicherry, Rajasthan, Sikkim, Tamil Nadu and Telangana has received more than normal (positive departure of more than 10%) rainfall in the monsoon season. The states of Arunachal Pradesh, Bihar, Delhi, Jharkhand, Kerala, Meghalaya, Nagaland, Tripura, Uttar Pradesh and West Bengal have received rainfall with negative departure (more than 10%) from normal. The national average monsoon rainfall is 900 mm with a negative departure of 1.58% from normal.

PLATE – II

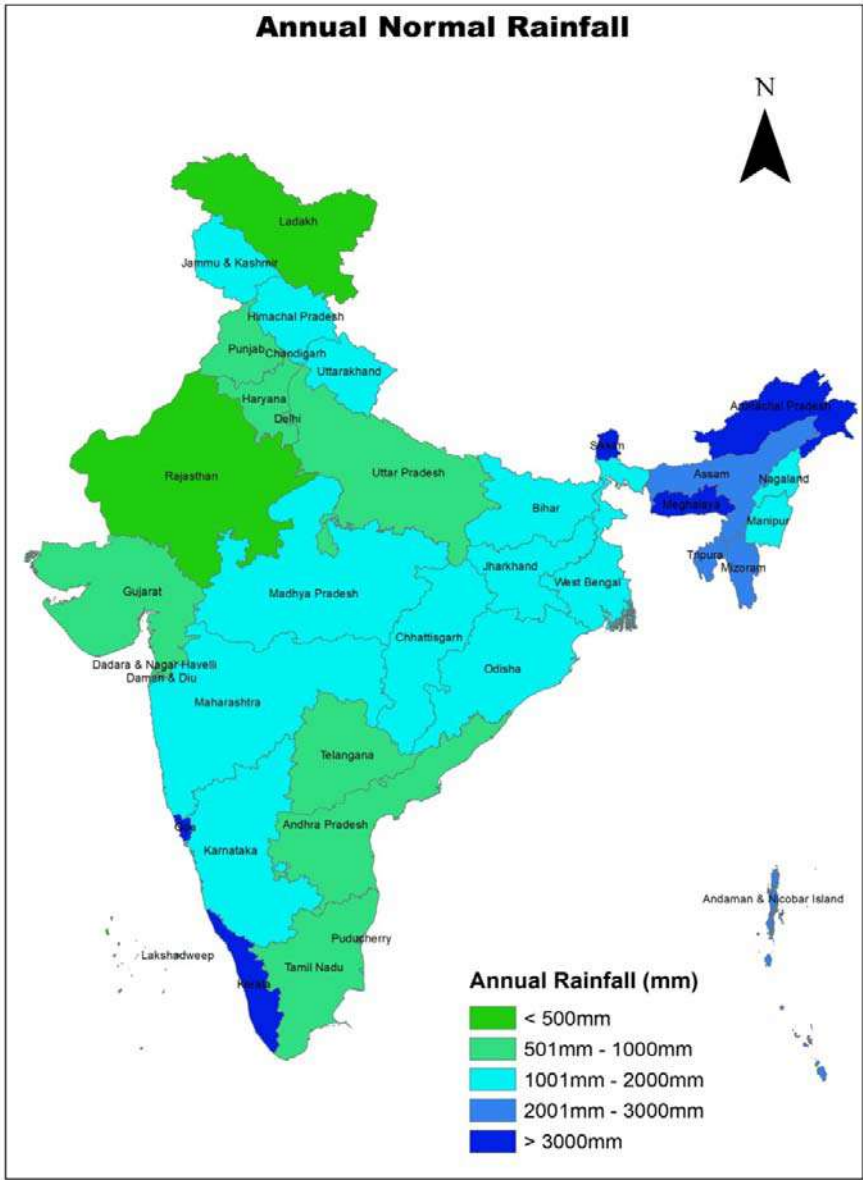
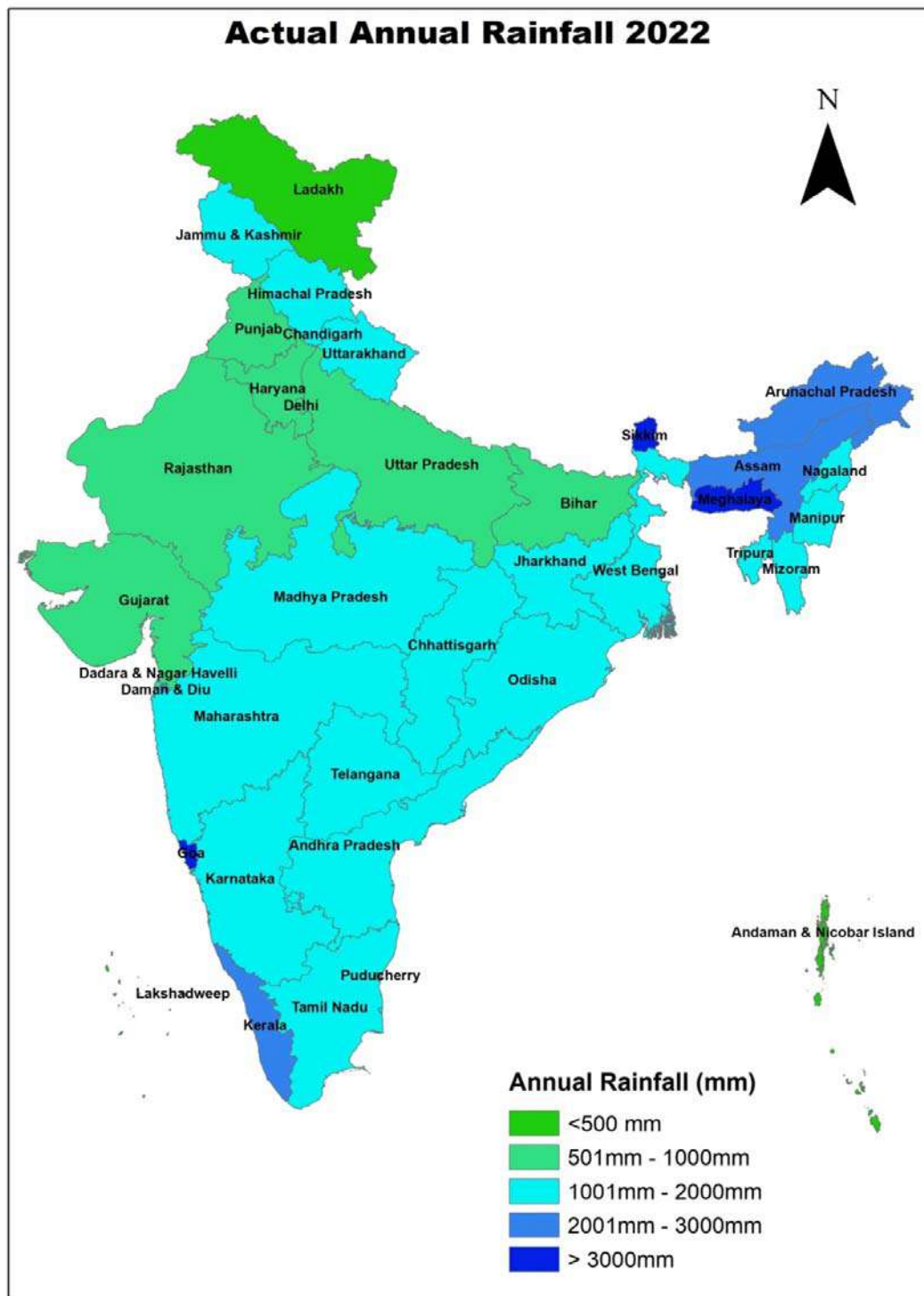


PLATE – III



3.0 GROUNDWATER LEVEL SCENARIO

3.1 INTRODUCTION

Ground Water Year Book is prepared annually by CGWB depicting changes in groundwater regime of the country through different seasons. It is an effort to obtain information on groundwater levels through representative monitoring wells. The important attributes of groundwater regime monitoring are groundwater level.

The natural conditions affecting the groundwater regime involve climatic parameters like rainfall, evapotranspiration etc., whereas anthropogenic influences include pumpage from the aquifer, recharge due to irrigation systems and other practices like waste disposal etc.

Groundwater levels are being measured by Central Ground Water Board four times a year during January, March/April/ May, August and November. The regime monitoring started in the year 1969 by Central Groundwater Board. A network of 25437 observation wells, as on 30.04.2023, located all over the country is being monitored. Groundwater samples are collected from these observation wells once a year during the month of March/April/May to obtain background information of groundwater quality changes on regional scale. The database thus generated forms the basis for planning the groundwater development and management programmes. The groundwater level and quality monitoring are of particular importance in coastal as well inland saline environment to assess the changes in salt water/fresh water interface as also the gradual quality changes in the fresh groundwater regime. This data is used for assessment of groundwater resources and changes in the regime consequent to various development and management activities.

The premonsoon water level data is collected from all the monitoring stations during the months of March/ April/ May, depending on the climatological conditions of the region. For North eastern states premonsoon data is collected during March, since the onset of monsoon is normally observed in April. Similarly for Orissa, West Bengal and Kerala where monsoon appears early in May the monitoring is carried out during the month of April. For remaining states pre-monsoon monitoring month is May. Water levels during August are monitored to access the impact of monsoon on the groundwater resources. Post monsoon data collected during November reflects the cumulative effect of groundwater recharge and withdrawal of groundwater for various purposes. January water level data indicates the effect of withdrawal for rabi crops.

The data is analyzed to know about the frequency distribution of water levels during different periods and seasonal, annual and decadal fluctuations in water levels. The water level and

water level fluctuation maps are prepared for each monitoring period to study the spatial and temporal changes in groundwater regime.

The State/UT-wise distribution of the groundwater observation wells is given in **Table 3** and depicted in **Plate-IV**.

PLATE - IV

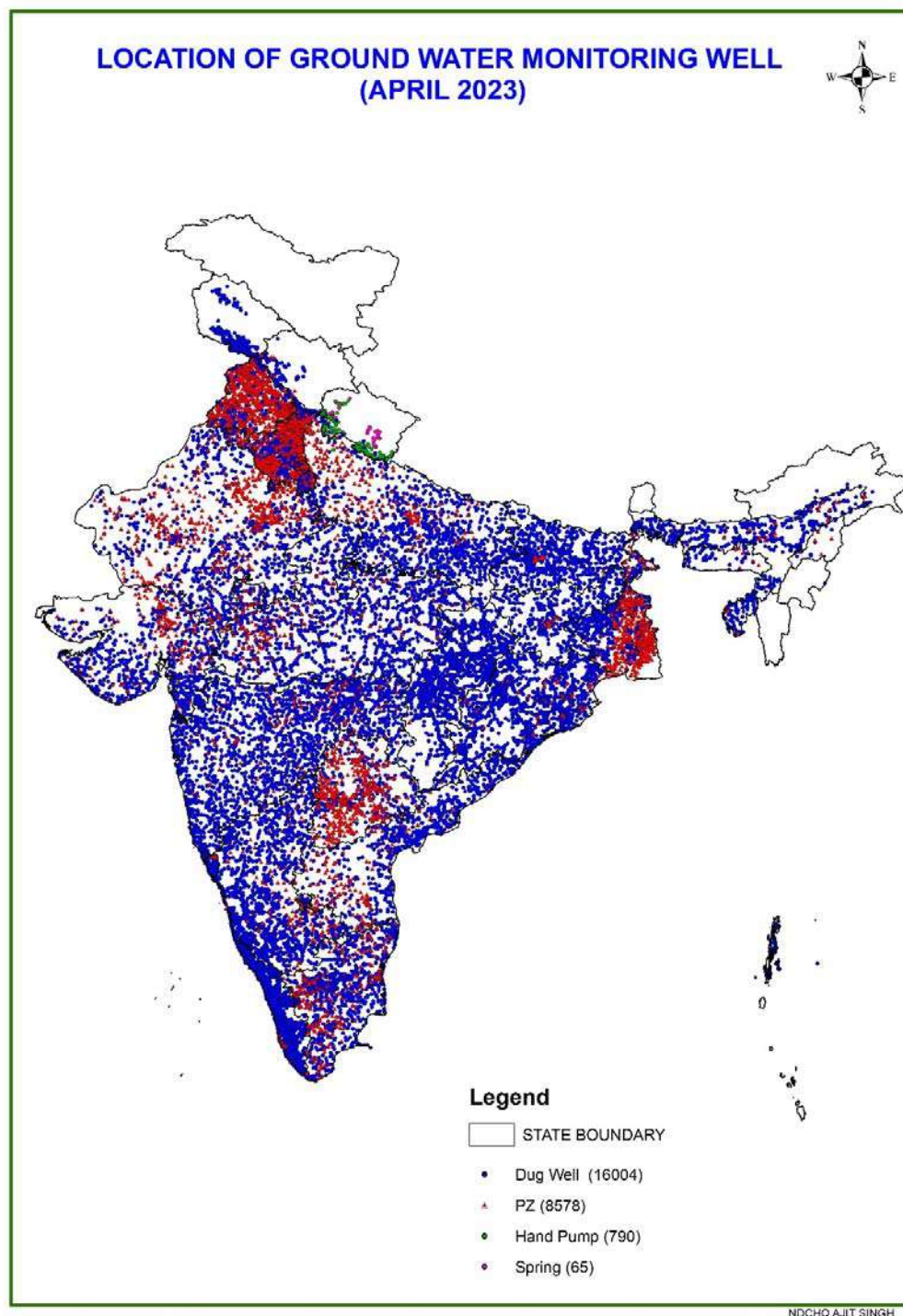


TABLE3: STATE/UT -WISE STATUS OF GROUNDWATER MONITORING WELLS

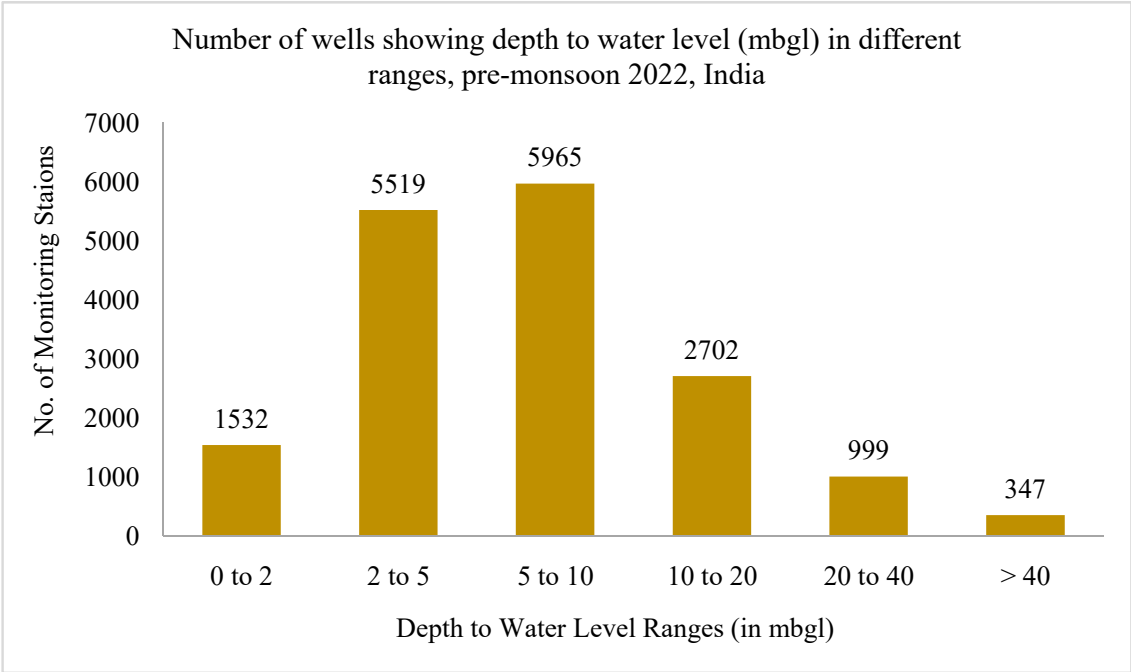
Sl No	Name of the State/UT	Number of GW Monitoring Stations (April 2023)				
		Dug Well	Piezometer	Handpump	Spring	Total
1	Andhra Pradesh	633	701	0	0	1334
2	Arunachal Pradesh	26	5	0	0	31
3	Assam	355	80	0	0	435
4	Bihar	800	90	0	0	890
5	Chhattisgarh	1041	246	0	0	1287
6	Delhi	22	107	0	0	129
7	Goa	83	45	0	0	128
8	Gujarat	836	434	0	0	1270
9	Haryana	488	809	0	0	1297
10	Himachal Pradesh	138	32	0	24	194
11	Jammu & Kashmir	287	92	0	0	379
12	Jharkhand	419	96	0	0	515
13	Karnataka	1366	780	0	0	2146
14	Kerala	1351	259	0	0	1610
15	Madhya Pradesh	1178	434	0	0	1612
16	Maharashtra	1658	273	0	0	1931
17	Manipur	2	0	0	0	2
18	Meghalaya	60	14	0	0	74
19	Mizoram	3				3
20	Nagaland	12	1	0	0	13
21	Odisha	1483	235	0	0	1718
22	Punjab	180	990	0	0	1170
23	Rajasthan	642	709	0	0	1351
24	Sikkim	0	4	0	0	4
25	Tamil Nadu	794	587	0	0	1381
26	Telangana	257	950	0	0	1207
27	Tripura	100	18	0	0	118
28	Uttar Pradesh	838	356	0	0	1194
29	Uttarakhand	40	12	132	41	225
30	West Bengal	754	185	658	0	1597
	UTs					
1	Andaman & Nicobar	110	2	0	0	112
2	Chandigarh	1	22	0	0	23
3	Dadra & Nagar Haveli	17	0	0	0	17
4	Daman & Diu	21	3	0	0	24
5	Pondicherry	9	7	0	0	16
Total		16004	8578	790	65	25437

3.2 GROUNDWATER REGIME IN UNCONFINED AQUIFER

3.2.1 DEPTH TO WATER LEVEL IN UNCONFINED AQUIFER

DEPTH TO WATER LEVEL – PRE-MONSOON 2022

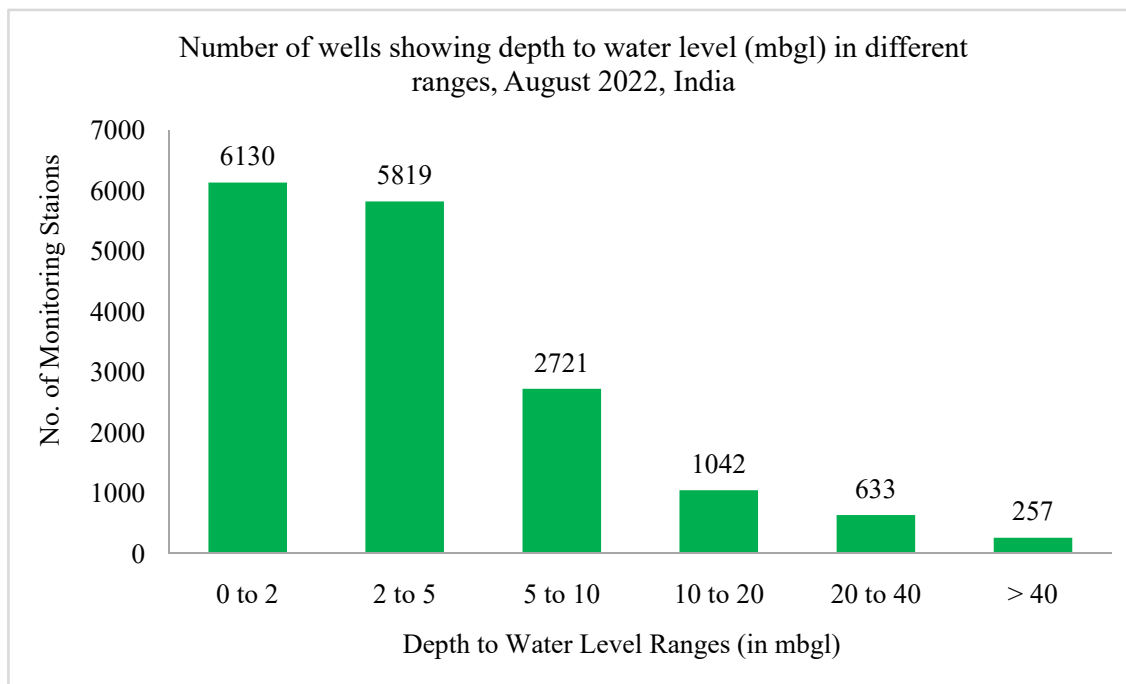
The groundwater level data for pre-monsoon 2022 indicates that out of the total 17064 wells analysed, 1532 (9%) wells are showing water level less than 2 m bgl (metres below ground level), 5519 (32.3%) wells are showing water level in the depth range of 2 to 5 m bgl, 5965 (35.0 %) wells are showing water level in the depth range of 5 to 10 m bgl, 2702 (15.8%) wells are showing water level in the depth range of 10 to 20 m bgl, 999 (5.9%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 347 (2%) wells are showing water level more than 40 m bgl. The maximum depth to water level of 145.50 m bgl is observed in Bikaner district of Rajasthan whereas the minimum is less than 1 m bgl (**Plate VI, Annexure I**). Groundwater level data of pre-monsoon 2022 for the country reveals that the general depth to water level of the country ranges from 5 to 10 m bgl. Very shallow water level of less than 2 m bgl is observed in few states, such as Andhra Pradesh, Assam, Karnataka, Kerala, Odisha, Tamil Nadu and West Bengal in small patches. Groundwater level in the range of 2 to 5 m bgl is seen in Assam, Uttar Pradesh, Bihar, Coastal parts of Odisha, few pockets in Andhra Pradesh, Gujarat and Maharashtra. Major part of the country shows water level in the range 5 to 10 m bgl, especially in the states of Madhya Pradesh, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Odisha, Chhattisgarh, Maharashtra, Gujarat, Tamil Nadu, Telangana and Karnataka. In major parts of north-western and western states, especially in the states of Delhi, Haryana, Punjab and Rajasthan, depth to water level is generally deeper and ranges from about 20 to more than 40 m bgl.



DEPTH TO WATER LEVEL – AUGUST 2022

The groundwater level data for August 2022(*Annexure-II*) indicates that, out of the 16602wells analysed, 6130 (36.9 %) wells are showing water level less than 2 m bgl (metres below ground level), 5819(35.0%) wells are showing water level in the depth range of 2-5 m bgl, 2719 (16.4%) wells are showing water level in the depth range of 5-10 m bgl, 1042 (6.3%) wells are showing water level in the depth range of 10-20 m bgl, 633 (3.8%) wells are showing water level in the depth range of 20-40 m bgl and the remaining 257(1.5%) wells are showing water level more than 40 m bgl,The map of depth to water levels during August 2022 is shown in **Plate-VII**. The general depth to water level of the country ranges from 0 to 5 m bgl. Almost 72% of the wells analysed show water level in the range of 0 to 5 m bgl.Very shallow water level of less than 2 m bgl is observed in considerable number of wells in almost all the states,except Chandigarh, Punjab, Delhi and Tamil Nadu.Water level in the range of 2 to 5 m bgl, is observed in almost all states. Punjab, where less than 15 % of wells have water level of 2 to 5 mbgl.In major parts of north-western and western states, depth to water level is generally deeper and ranges fromabout 10 to 40 m bgl. In parts Delhi, Haryana, Punjab and Rajasthan, water level of more than 40 m bgl is also recorded.The maximum depth to water level of 130.6 m bgl is observed at Khara in Jodhpur district of

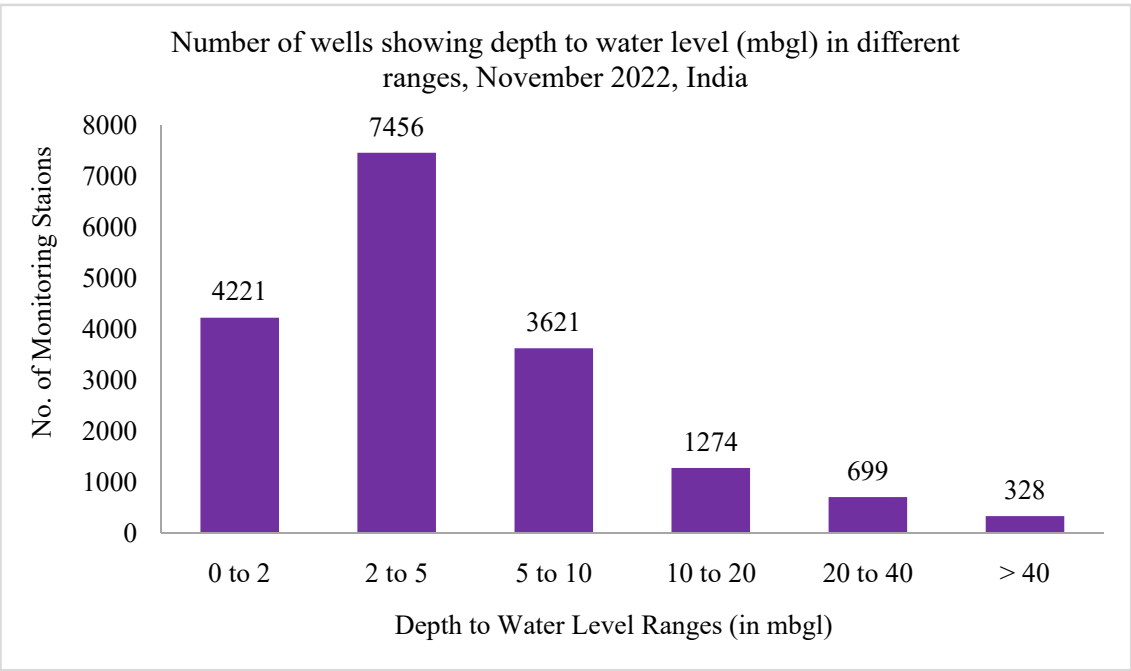
Rajasthan, whereas the minimum is 0.01 m bgl at places in Andhra Pradesh, Karnataka, Maharashtra, Gujarat and Madhya Pradesh.



DEPTH TO WATER LEVEL – NOVEMBER 2022 (POST-MONSOON)

The groundwater level data for November 2022 indicates that out of the total 17599 wells analysed, 4221 (24.0 %) wells are showing water level less than 2 m bgl, 7456 (42.4%) wells are showing water level in the depth range of 2 to 5 m bgl, 3621 (20.6%) wells are showing water level in the depth range of 5 to 10 m bgl, 1273 (7.2%) wells are showing water level in the depth range of 10 to 20 m bgl, 699 (4.0%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 329 (1.9%) wells are showing water level more than 40 m bgl. In general, depth to water level ranges from 2 to 5 m bgl as observed at about 66.4% of the monitoring stations. Very shallow water level of less than 2 m bgl is observed in all the states, except Chandigarh. Groundwater level in the range of 2 to 5 m bgl is predominant in the entire Country, as major part of the country shows water level in the range 2 to 5 m bgl. In parts of north-western and western states, especially in the states/UTs of Chandigarh, Delhi, Haryana, Punjab and Rajasthan, depth to water level is generally deeper and ranges from about 10m bgl to more than 40 m bgl. The peninsular part of country recorded a water level in the range of 2 to 10 m bgl. The maximum depth to water level of

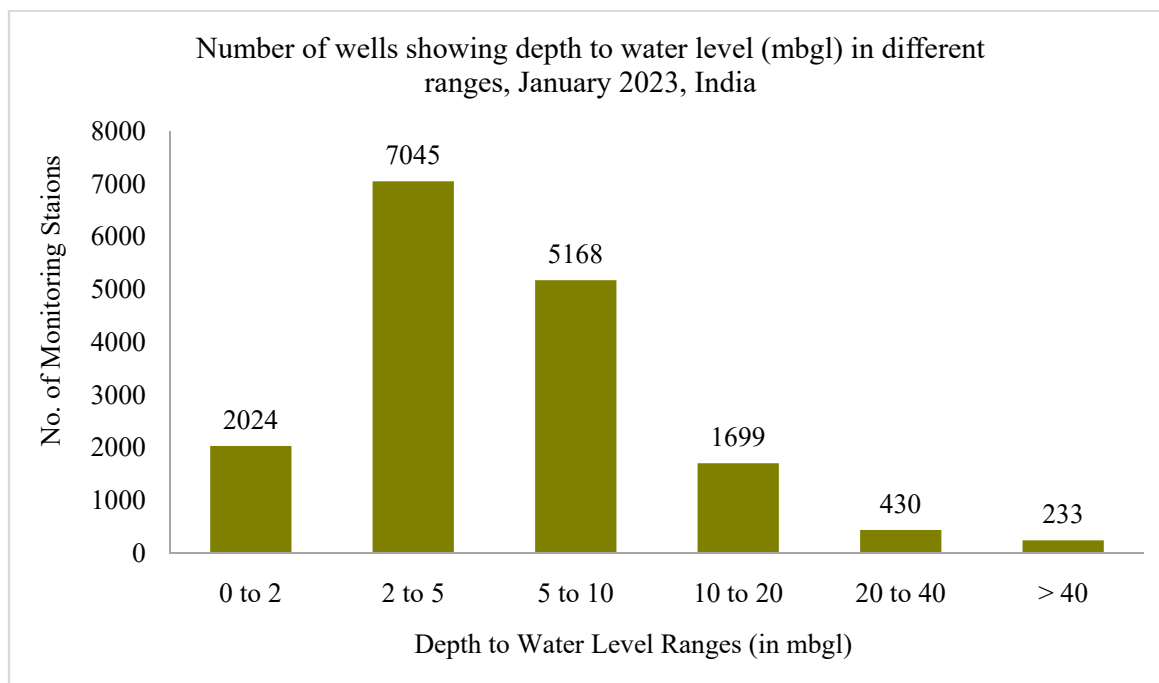
124.5 m bgl is observed in Jodhpur district of Rajasthan whereas the minimum is less than 1 m bgl(**Plate-VIII, Annexure- III**).



DEPTH TO WATER LEVEL– JANUARY 2023

The groundwater level data for January 2023 indicates that out of the total 16599 wells analysed, 2024 (12.2%) wells are showing water level less than 2 m bgl (metres below ground level), 7045 (42.4%) wells are showing water level in the depth range of 2 to 5 m bgl, 5168 (31.1%) wells are showing water level in the depth range of 5 to 10 m bgl, 1699 (10.2%) wells are showing water level in the depth range of 10 to 20 m bgl, 430 (2.6%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 233 (1.4%) wells are showing water level more than 40 m bgl. The maximum depth to water level of 146.11 m bgl is observed in Jodhpur district of Rajasthan, whereas the minimum is less than 1 m bgl. (**Plate-IX,Annexure-IV**). The depth to water level map of January 2023for the country indicates that in general depth to water level ranges from 2 to 10 m bgl as observed at about 86% of themonitoring stations. Shallow water level of less than 2 m bgl is observed in very small and isolated pockets in the states of Assam, Odisha, Andhra Pradesh, Tamil Nadu, Konkan areas of Maharashtra and northern parts of Uttar Pradesh and Bihar.Water level in the range of 5 to 10 m bgl is prominent in all the states of Central and western parts of Karnataka and Kerala in Southern India. In major parts of north-western states depth to water level generally ranges from 10 to 40 m bgl. Water level of more than 40 m bgl is also

prevalent in the north western part of the country. In some parts of Haryana, Punjab and Delhi and major parts of Rajasthan, water level of more than 40 m bgl is recorded.



DEPTH TO WATER LEVEL AT A GLANCE

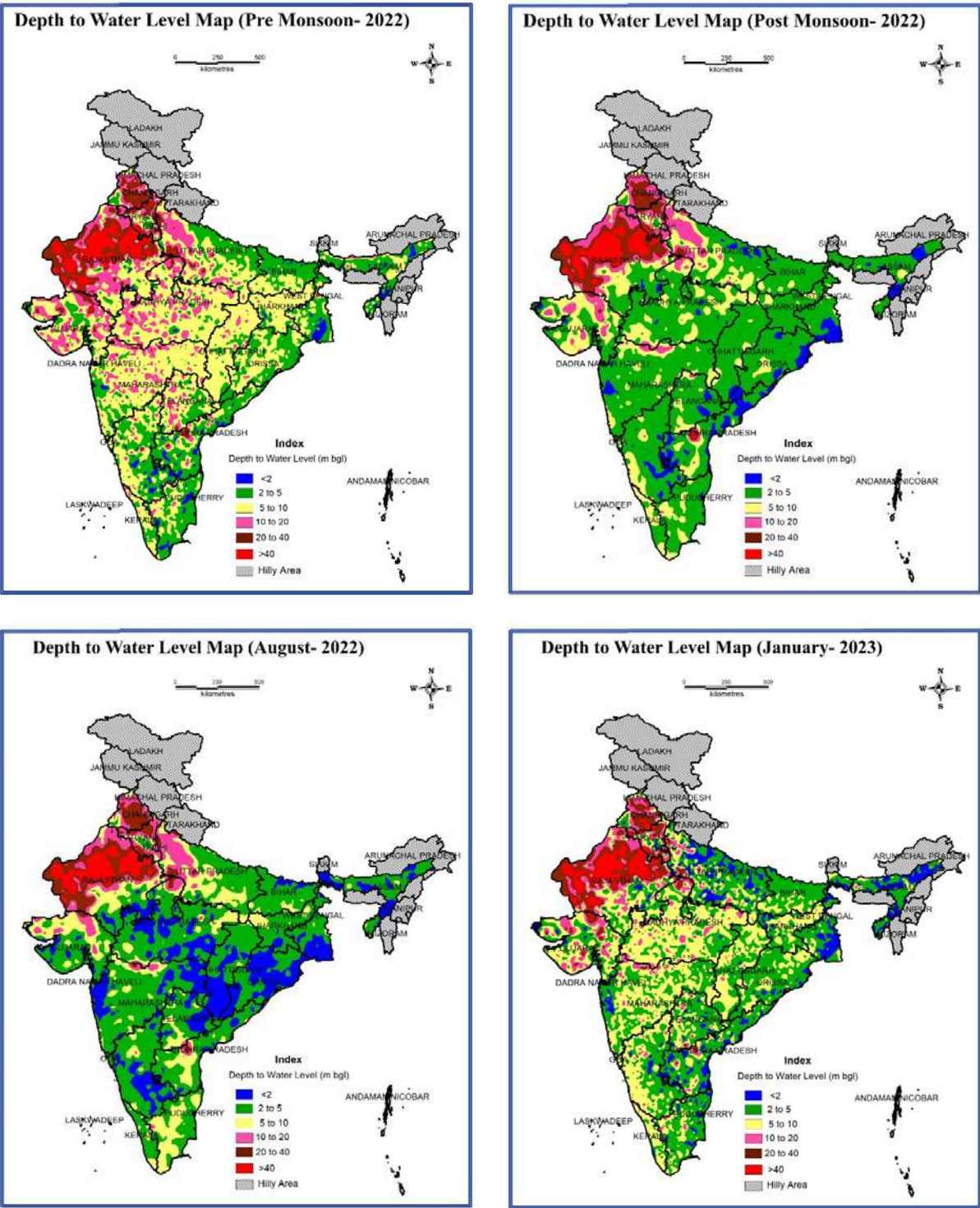
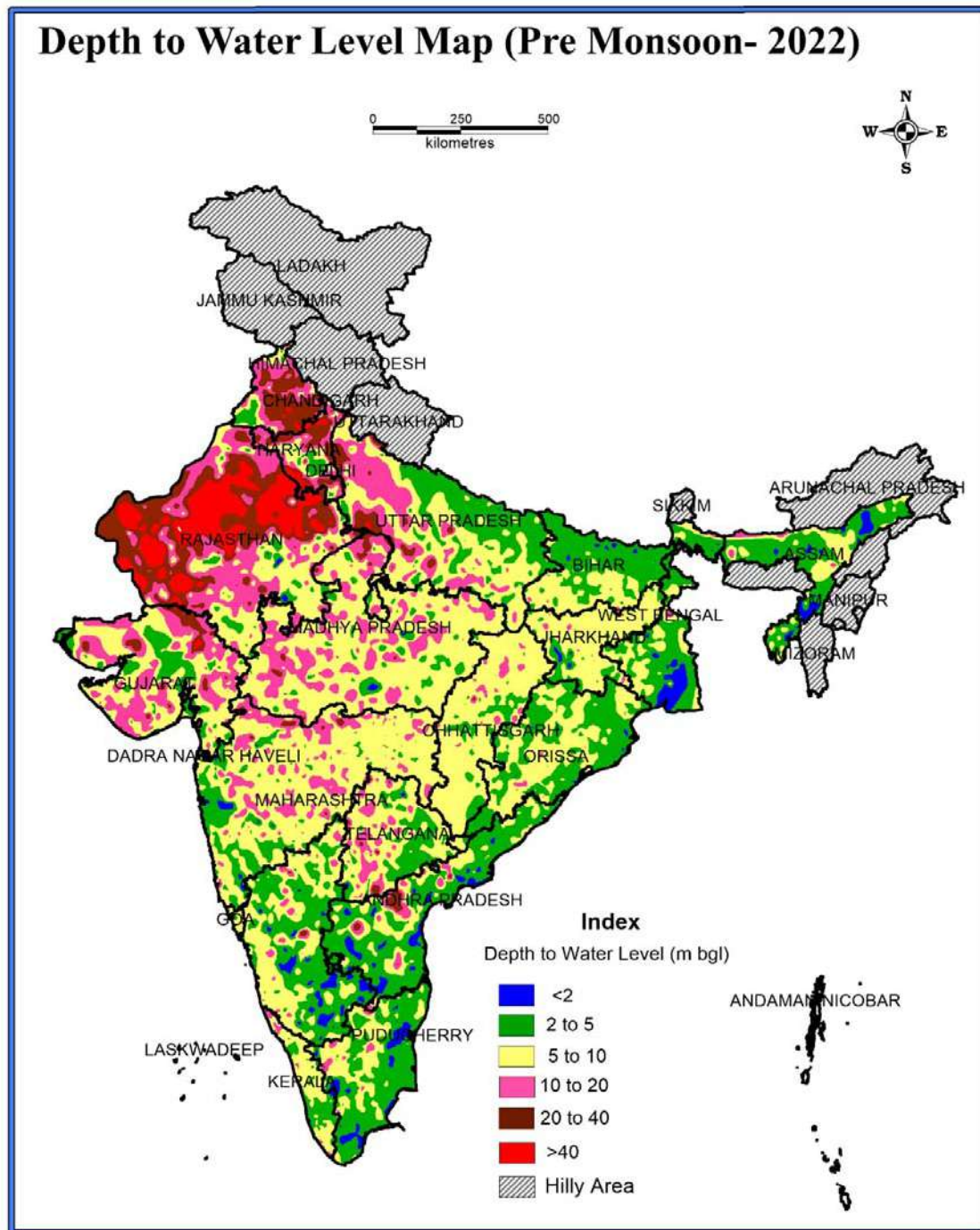
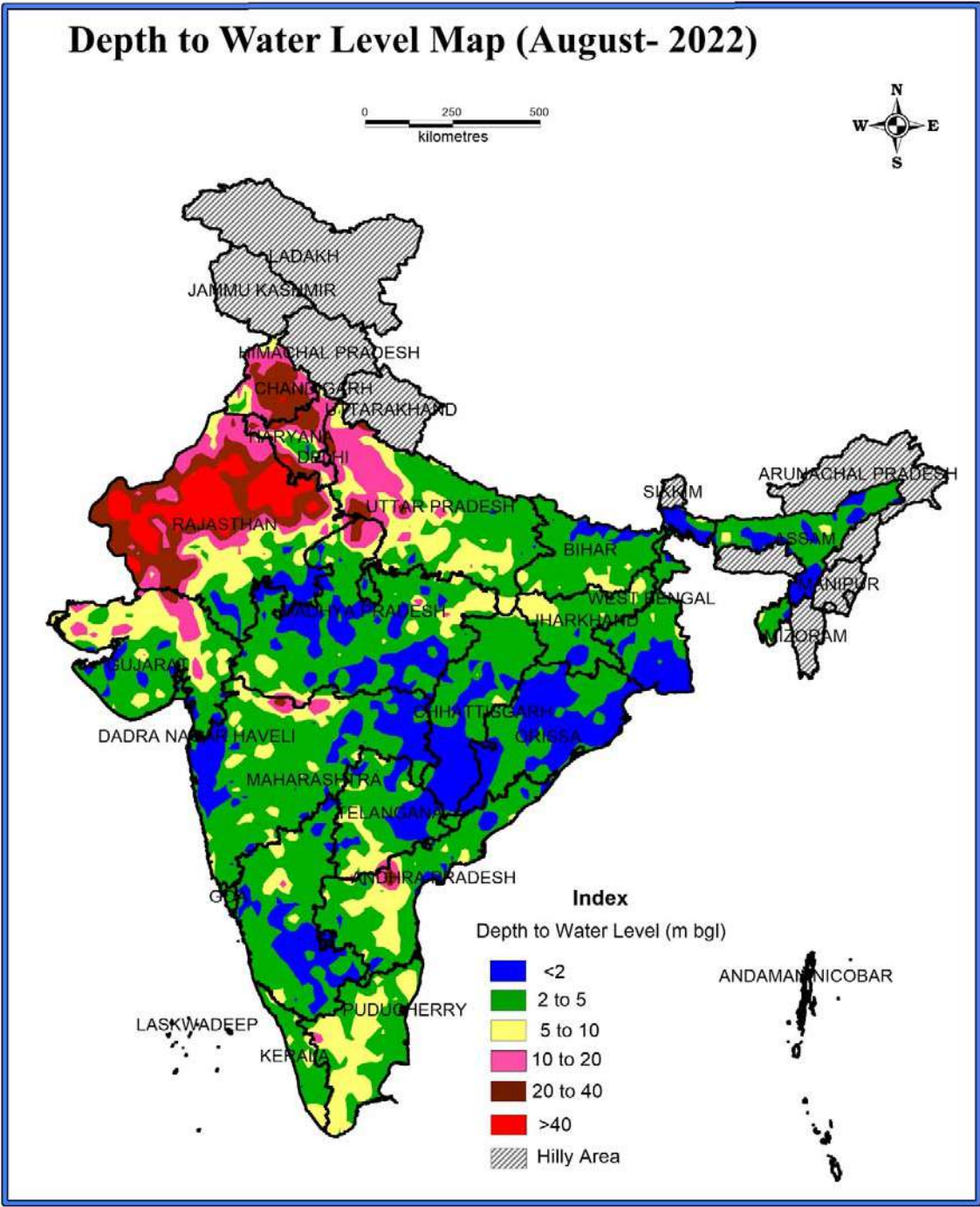
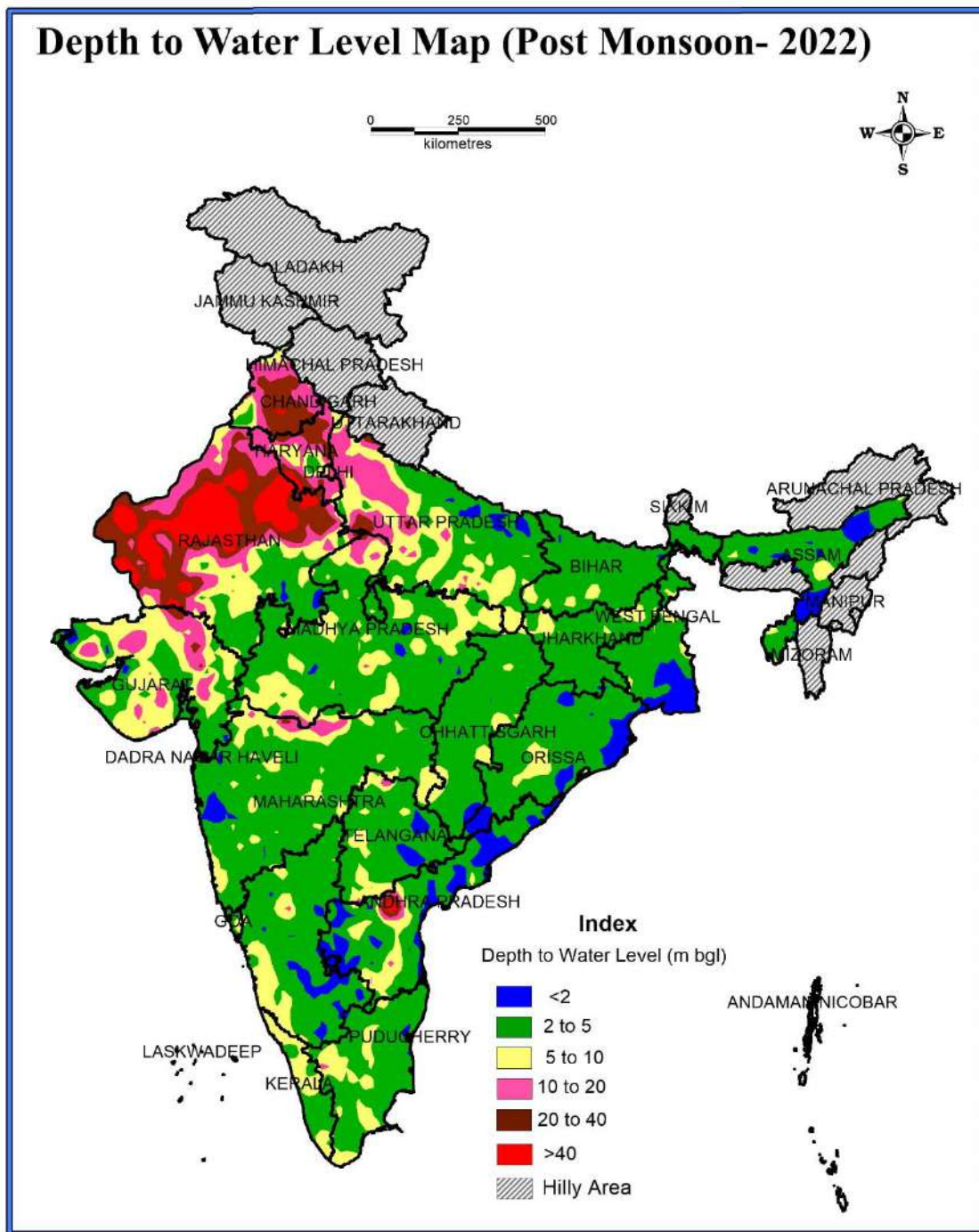
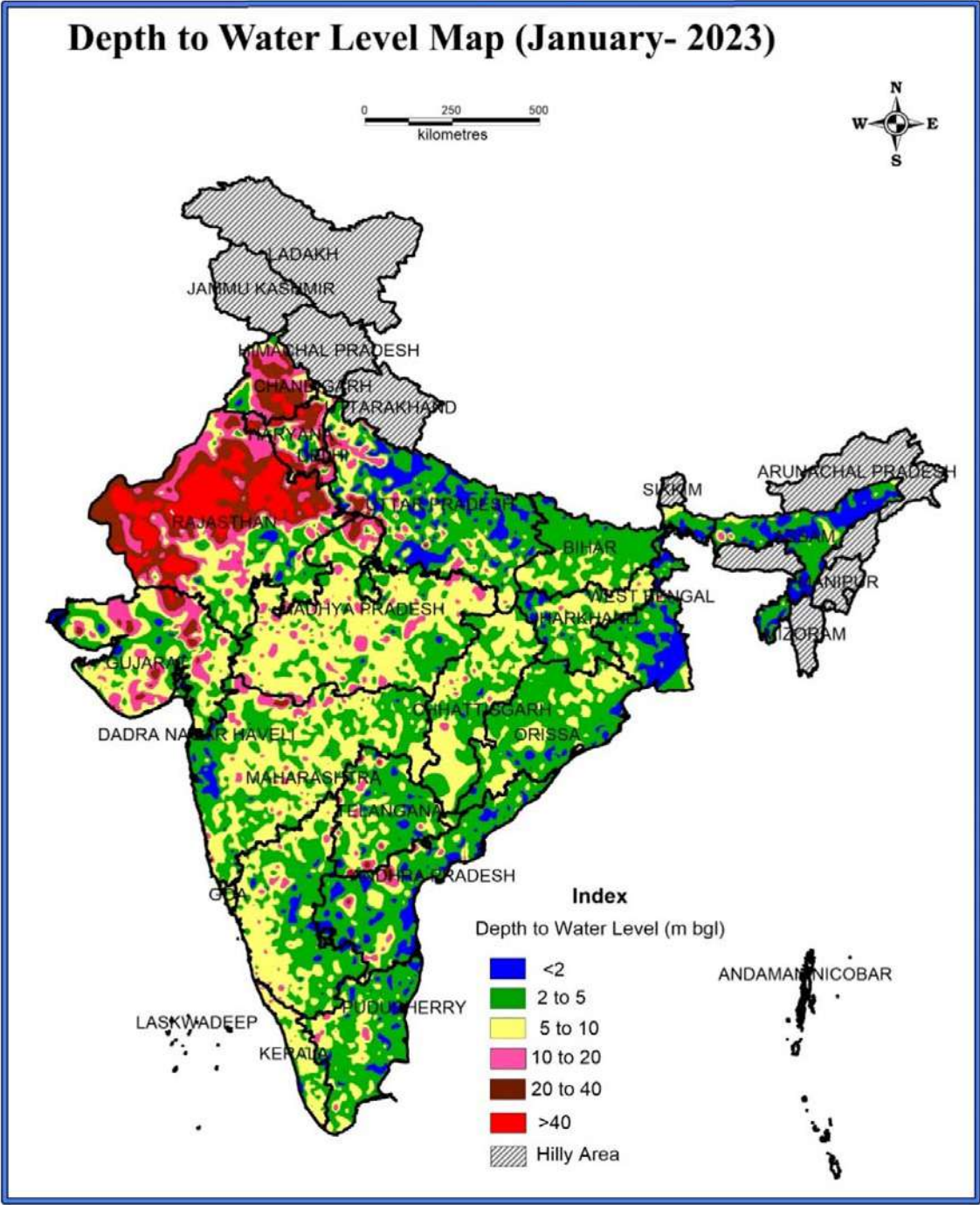


PLATE- VI





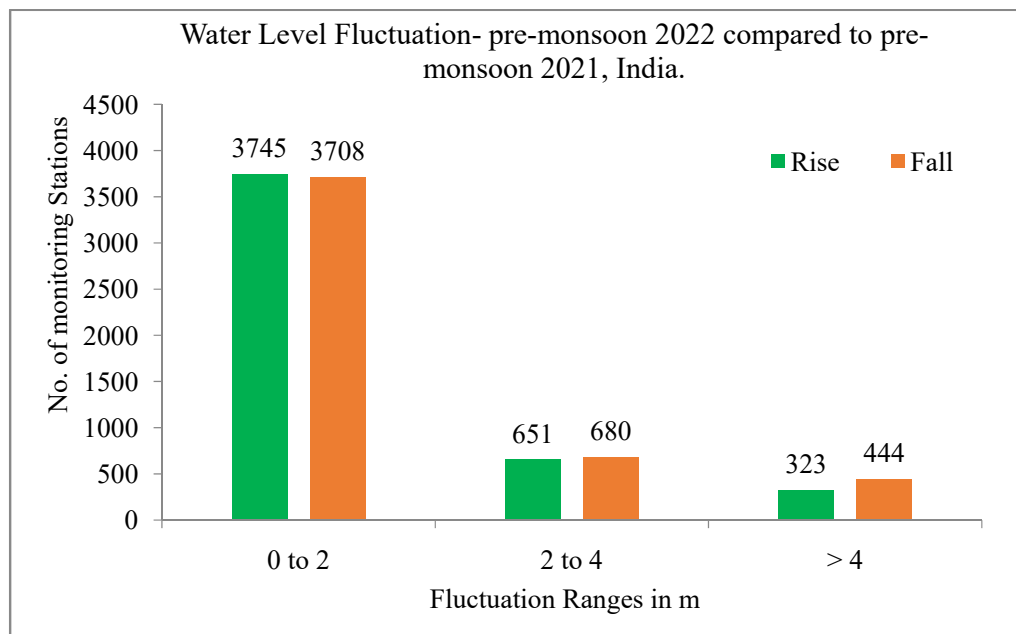




3.2.2 ANNUAL WATER LEVEL FLUCTUATION IN UNCONFINED AQUIFER

ANNUAL WATER LEVEL FLUCTUATION (PREMONSOON 2022 - PREMONSOON 2021)

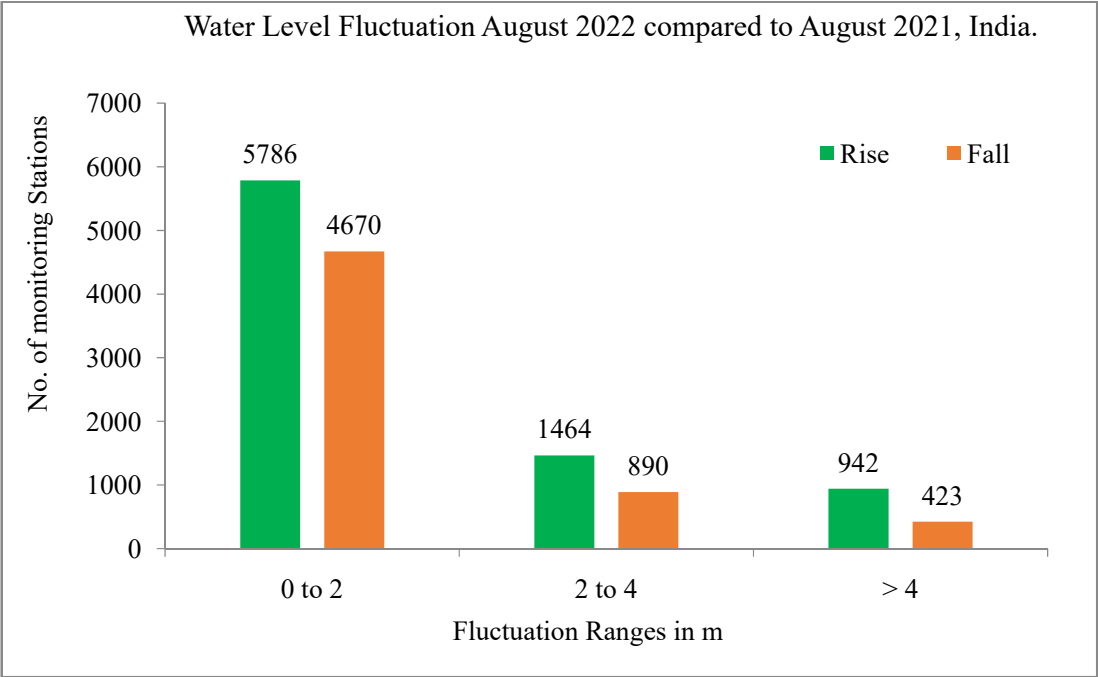
As less number of wells were monitored during pre-monsoon 2021, the water level fluctuation analysis could be done only in 9673 wells. The water level fluctuation of pre-monsoon 2022 compared to pre-monsoon 2021 shows that, 4719 (48.8%) are showing rise and 4832 (50.0%) are showing fall in water level. Remaining 122 (1.2%) stations analysed do not show any change in water level. Both rise and fall are equally predominant in the country. About 38.7% wells are showing rise in the water level in the range of less than 2 m. About 6.7% wells are showing rise in water level in 2 to 4 m range and 3.3% wells showing rise in water level more than 4 m range. Similarly, 38.3% wells are showing decline in water level in less than 2 m range. About 7% wells are showing decline in water level in 2 to 4 m range and 4.6% wells are showing decline in water level more than 4 m range. Fluctuation is mainly in the range of 0 to 2 m (**Plate XI, Annexure V**). A comparison of depth to water level of pre-monsoon 2022 to pre-monsoon 2021 also reveals that in general there is fall in water level in most part of the country. Fall is mostly in the range of 0 to 2 m, and observed in the states of Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Punjab, Rajasthan and Uttar Pradesh. Fall of more than 4 m is observed in isolated pockets, in the states of Chhattisgarh, Gujarat, Jharkhand and Rajasthan. Rise in water level is also observed in the states of Assam, Haryana, Kerala, Odisha, Tamil Nadu, West Bengal, Chandigarh, Delhi, Jammu and Kashmir and Puducherry.



ANNUAL WATER LEVEL FLUCTUATION (AUGUST 2022-AUGUST 2021)

A comparison of depth to water level of August 2022 with August 2021 reveals that in general, there is both rise and fall in water level in the country. Rise and fall are mostly in the range of 0 to 2 m. Rise in water level has been observed in the states of Andhra Pradesh, Chandigarh, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu and Telangana (Plate-XII, Annexure-VI). Falling water level is observed in Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jharkhand, Kerala, Meghalaya, Tripura, Uttarakhand, West Bengal and Puducherry.

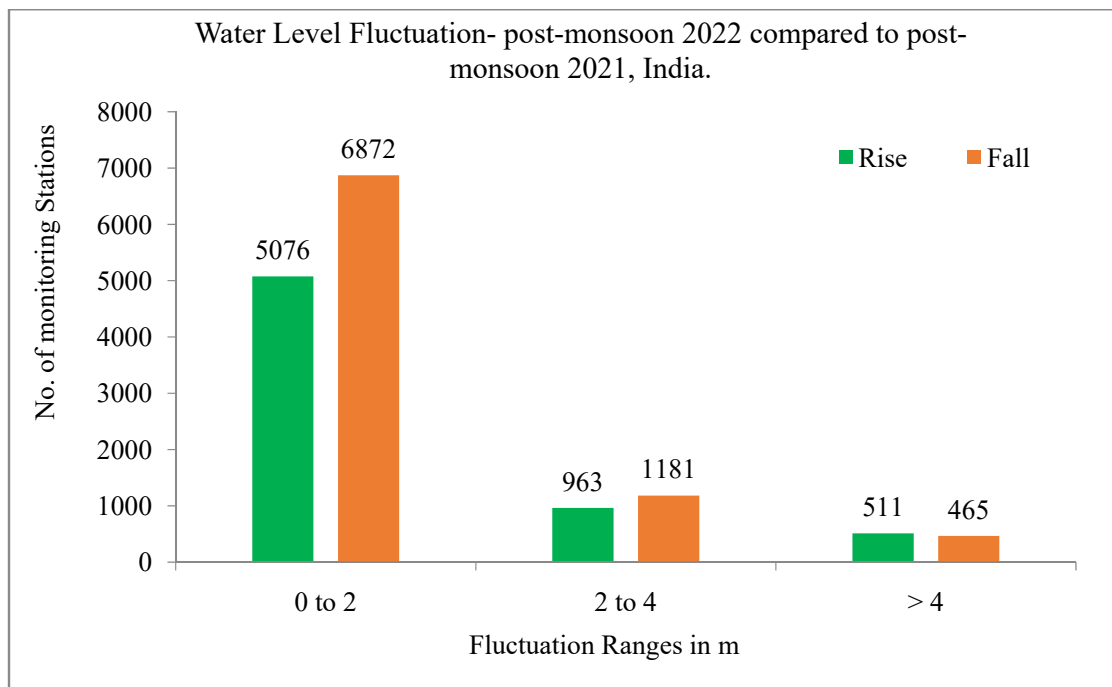
Out of total 14338 wells, about 57.1% (8192) are showing rise and 41.7% (5983) are showing fall in water level. Remaining 1.2% (163) wells do not show any change in water level. About 40.4% (5786) wells are showing rise in the range of less than 2 m, 10.2% (1464) wells in 2 to 4 m range and 6.6% (942) wells in more than 4 m range. About 41.7% wells are showing decline in water level, among which 32.6% (4670) wells are showing fall in water level in less than 2 m range, 6.2% (890) wells in water level in 2 to 4 m range and 3.0% (423) wells in more than 4 m range. Majority of the wells showing rise/decline falls in the range of 0 to 2 m.



ANNUAL WATER LEVEL FLUCTUATION(NOVEMBER 2022- NOVEMBER 2021) POST-MONSOON

The water level fluctuation of November 2022 compared to November 2021 shows that out of 15301 wells analysed, 6550 (42.8%) are showing rise and 8518 (55.7%) are showing fall in water level. Remaining 233 (1.5%) stations analysed do not show any change in water level. About 33.2% wells (5076) are showing rise in the water level in the range of less than 2 m. About 6.3% wells (963) are showing rise in water level in 2 to 4 m range and 3.3% wells (511) showing rise in water level more than 4 m range. About 55.7% wells are showing decline in water level, out of which 6872 wells (44.9%) are showing decline in water level in less than 2 m range. Majority of the wells showing rise/decline falls in the range of 0 to 2 m (Plate-XIII, Annexure-VII).

A comparison of depth to water level of November 2022 compared to November 2021 is presented in the form of water level fluctuation map reveals that in general, there is fall in water level in the central Peninsula India and western part of the country. Rise in water level is dominantly seen in all the states/UTs except in the states of Andhra Pradesh, Assam, Chhattisgarh, Haryana, Madhya Pradesh, Punjab, Rajasthan, Telangana, and Andaman & Nicobar Islands. Decline is mostly in the range of 0 to 2 m. There is fall in water level in Bihar, Odisha, Maharashtra, Karnataka, Kerala, Karnataka, Tamil Nadu West Bengal, Puducherry and Arunachal Pradesh observed in scattered pockets.



ANNUAL WATER LEVEL FLUCTUATION (JANUARY 2023- JANUARY 2022)

The water level fluctuation of January 2023 to January 2022 shows that out of 14314 wells analysed, 4639(32.4%) are showing rise and 4609 (66.4%) are showing fall in water level. Remaining 169 (1.2%) stations analysed do not show any change in water level. About 25.5% (3645) wells are showing rise in the water level in the range of less than 2 m. About 4.3% (621) wells are showing rise in water level in 2 to 4 m range and 2.6% (373) wells showing rise in water level more than 4 m range. About 66.4% wells are showing decline in water level, out of which 51.8% (7413) wells are showing decline in water level in less than 2 m range. About 9.9% (1412) wells are showing decline in water level in 2 to 4 m range and 4.8% (681) wells are showing decline in water level more than 4 m range. Majority of the wells showing rise/decline falls in the range of 0 to 2 m(Plate-XIV, Annexure-VIII).

Fall in water level is observed in almost all states and UTs. Fall is mostly in the range of 0 to 2 m, although fall in the range of more than 2 m is also prevalent in all the states in small patches.

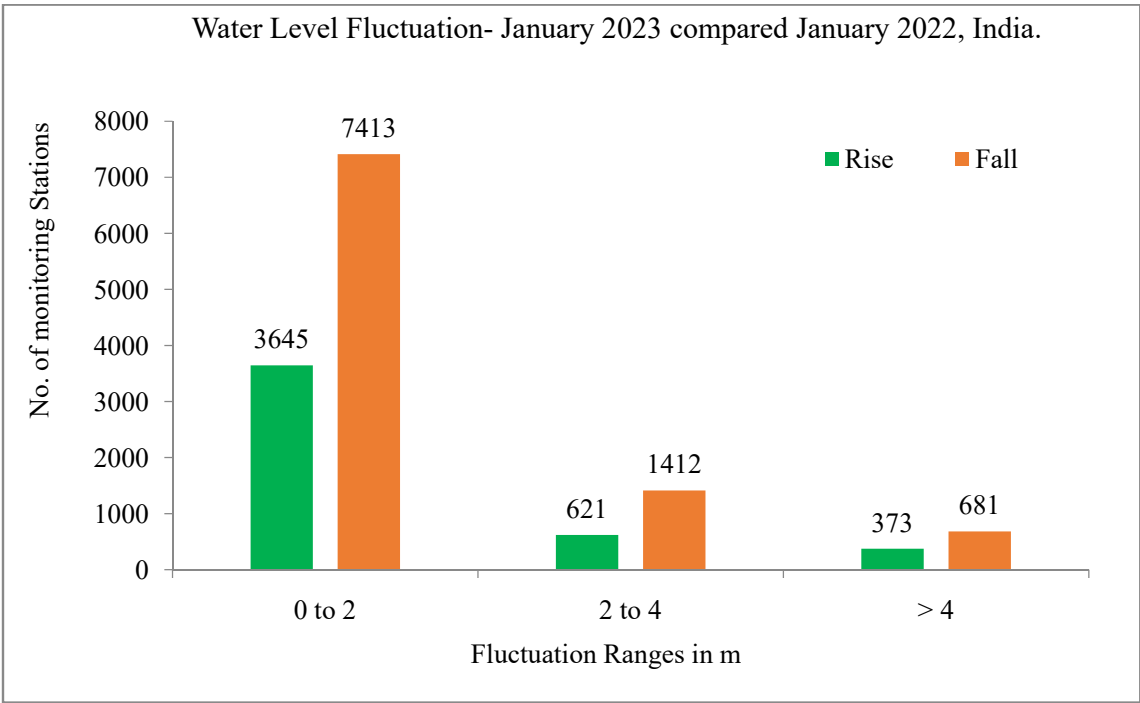
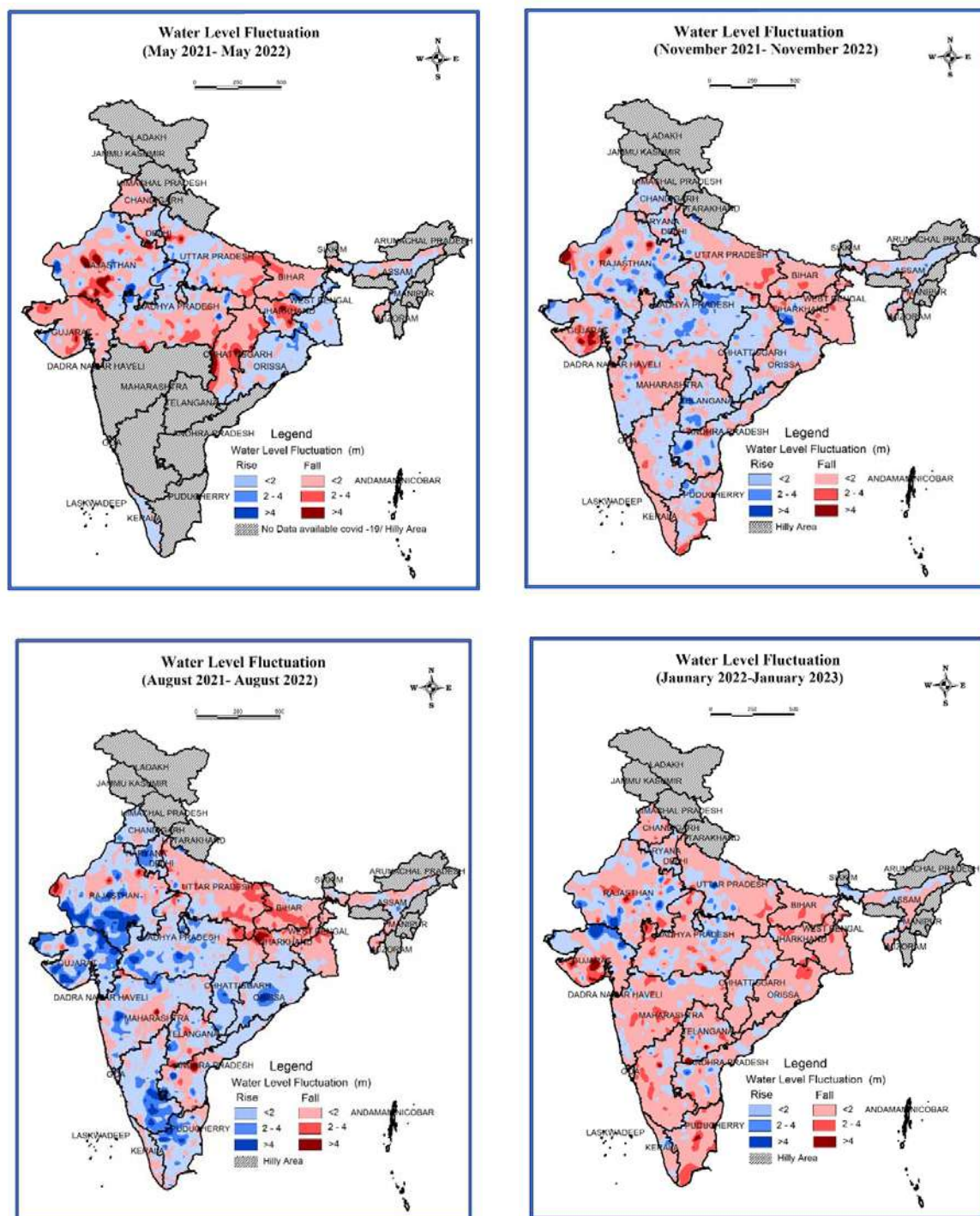


PLATE – X

ANNUAL WATER LEVEL FLUCTUATION AT A GLANCE



PLATE–XI

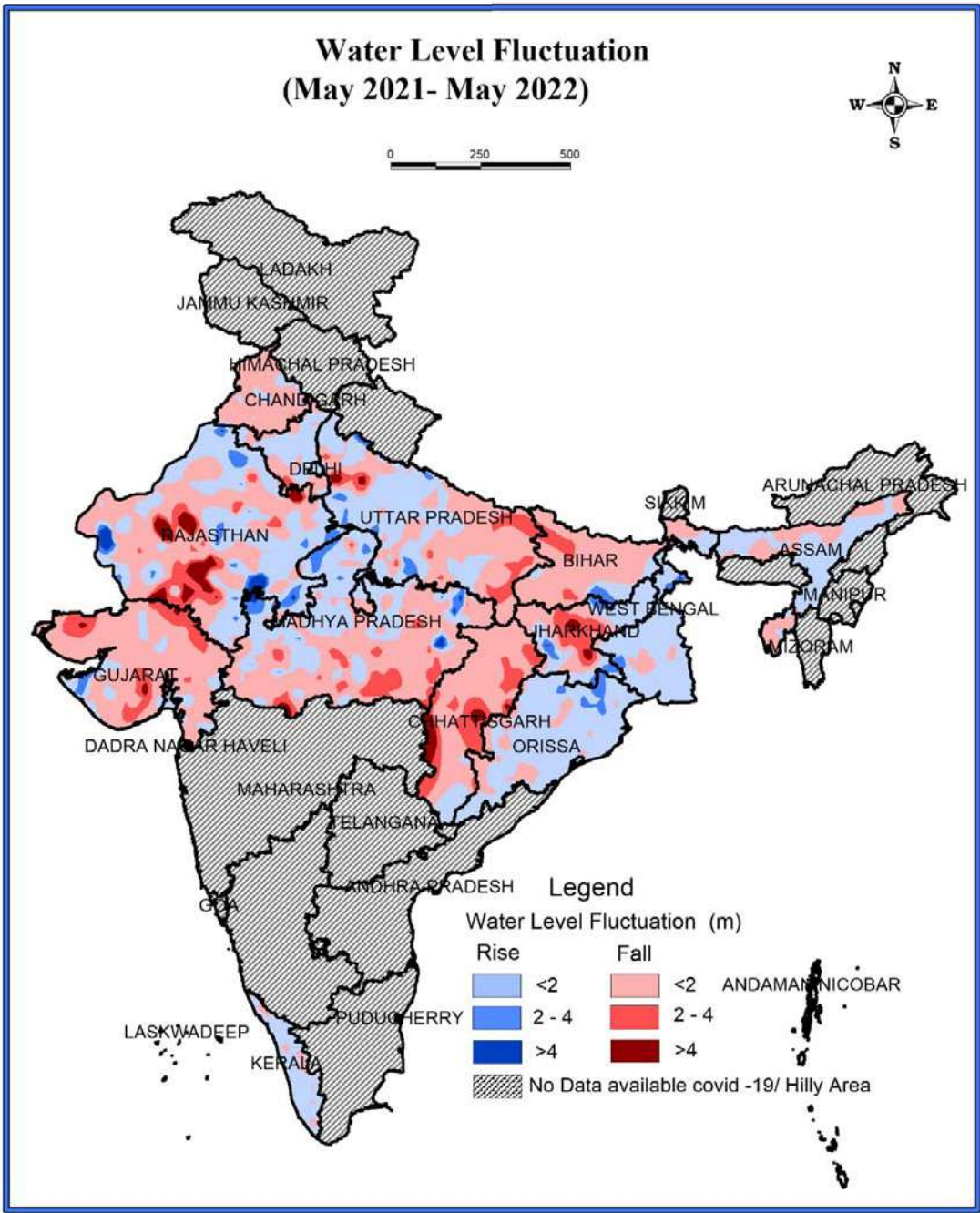
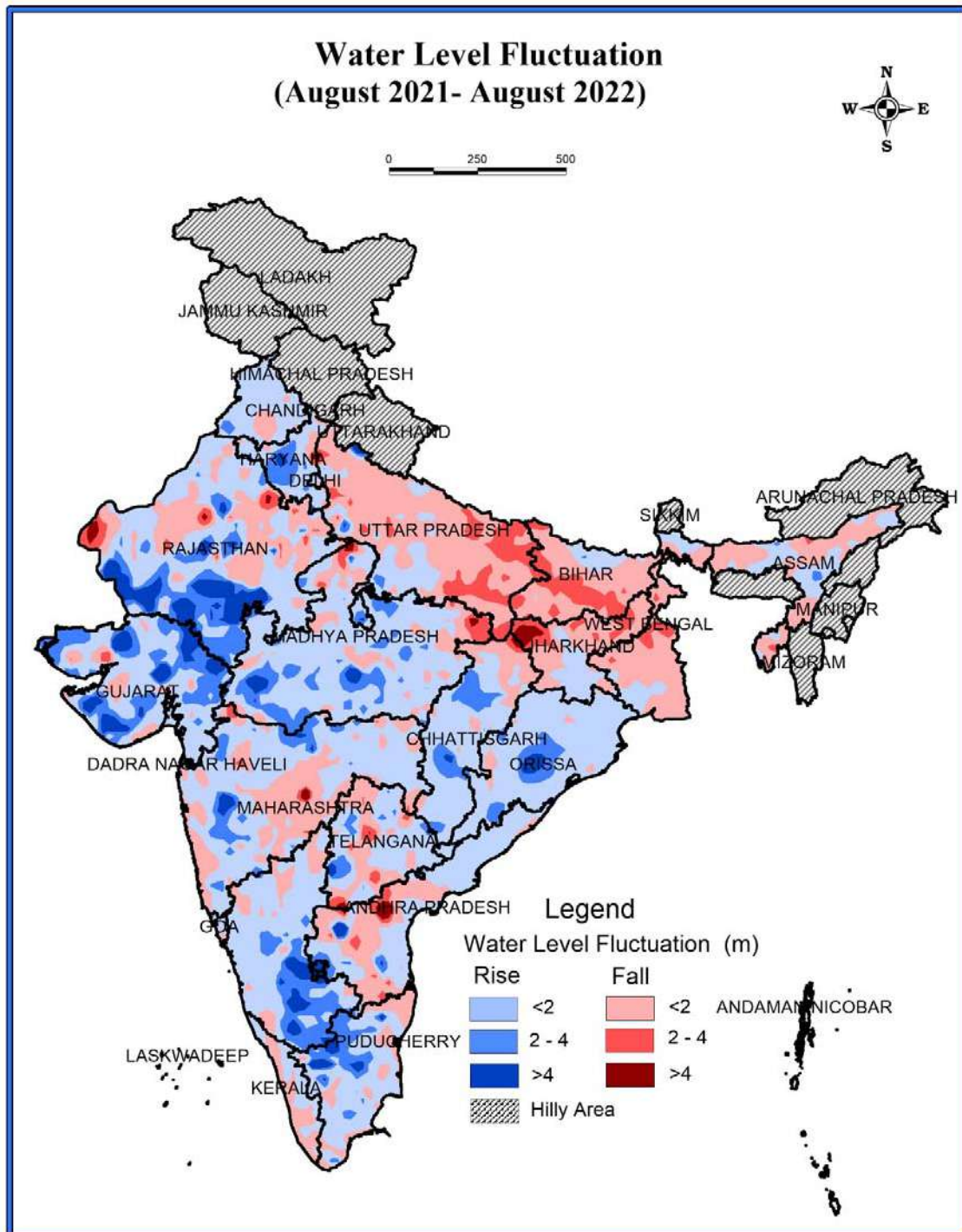


PLATE – XII



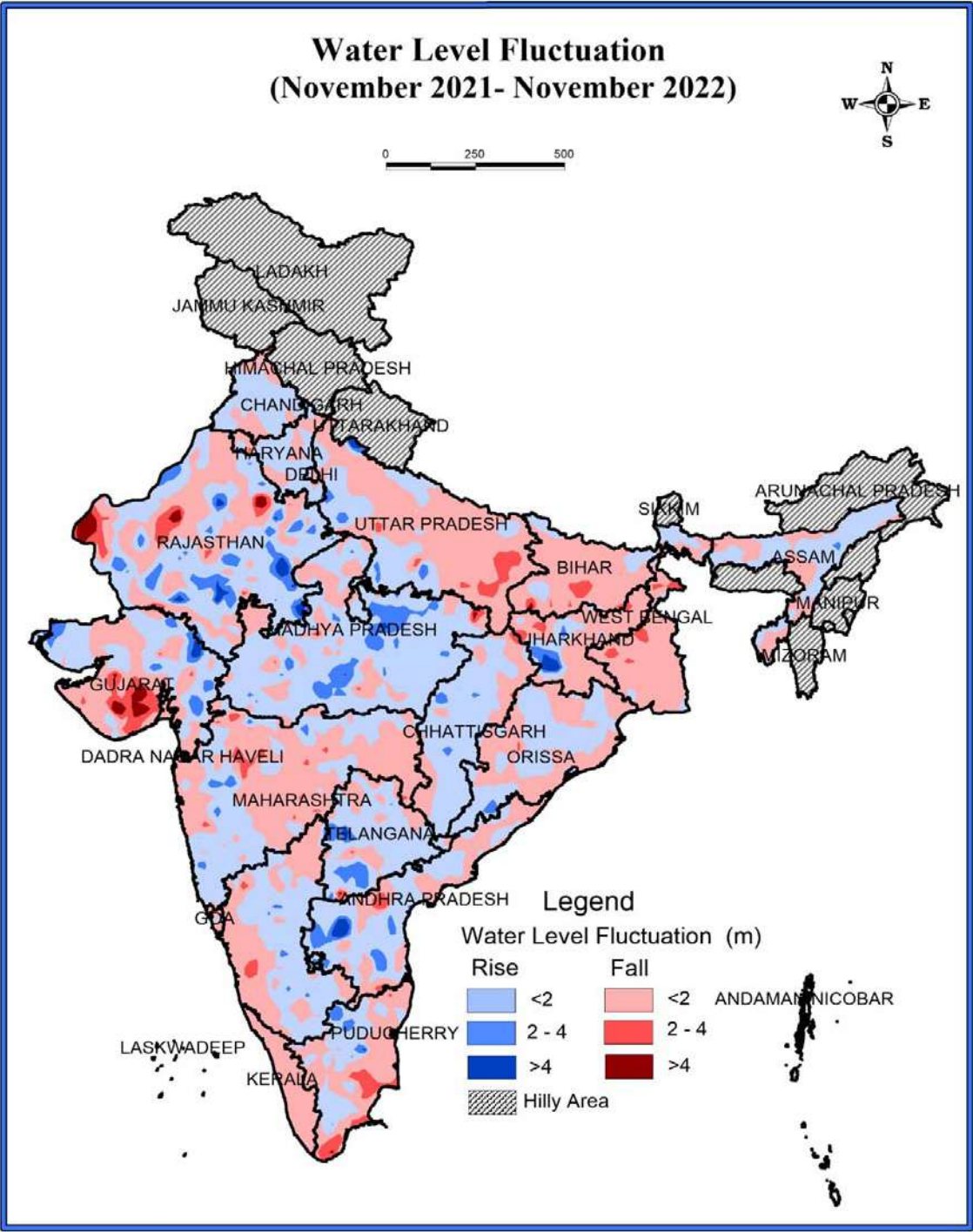
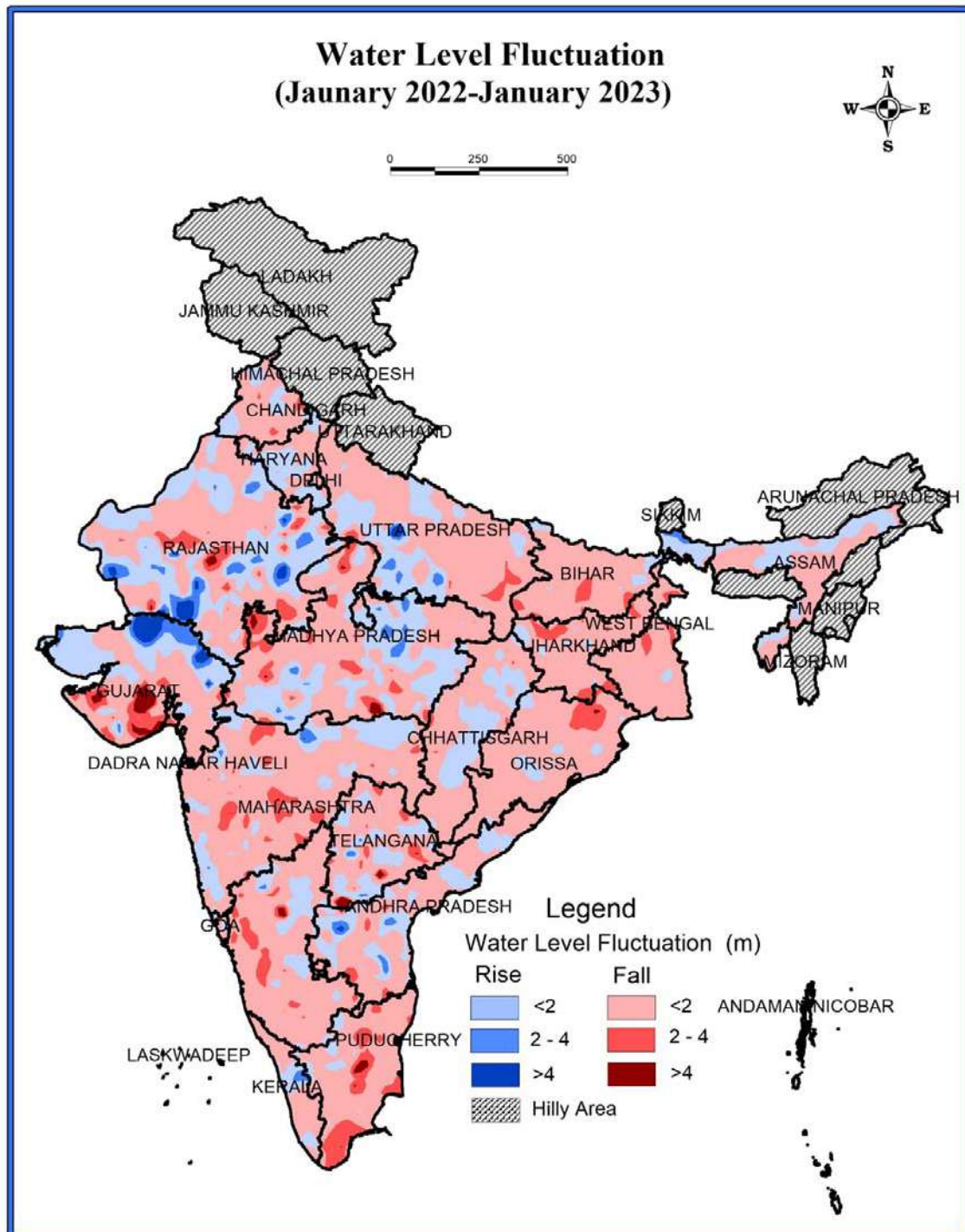


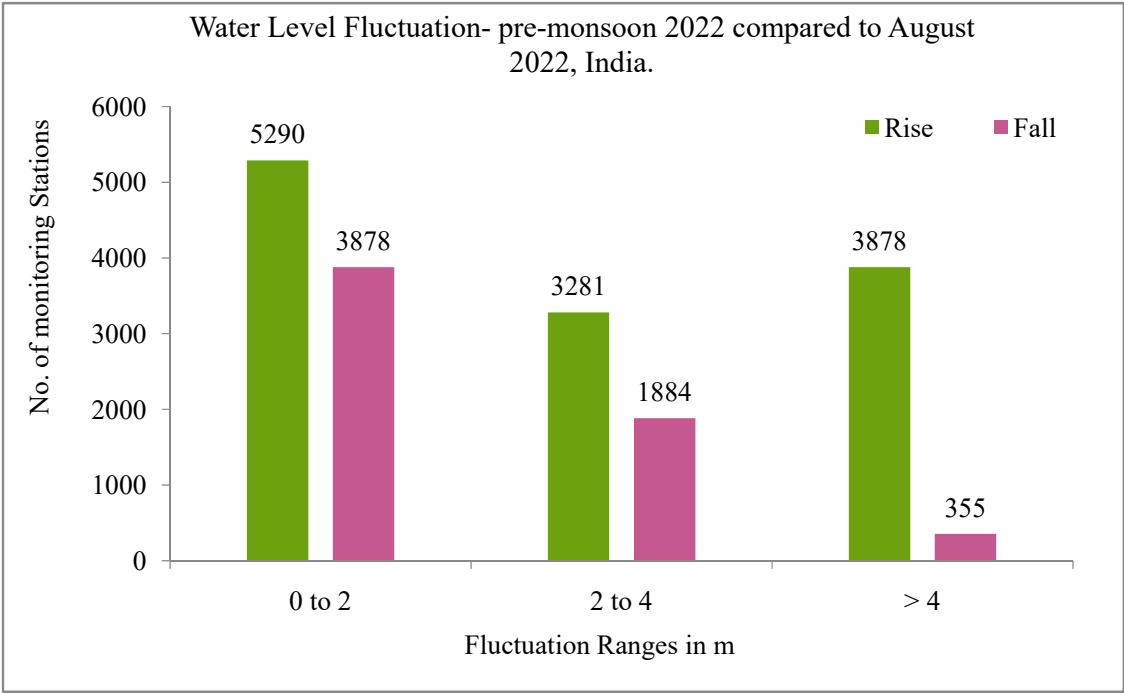
PLATE – XIV



3.2.3 SEASONAL WATER LEVEL FLUCTUATION IN UNCONFINED
AQUIFER

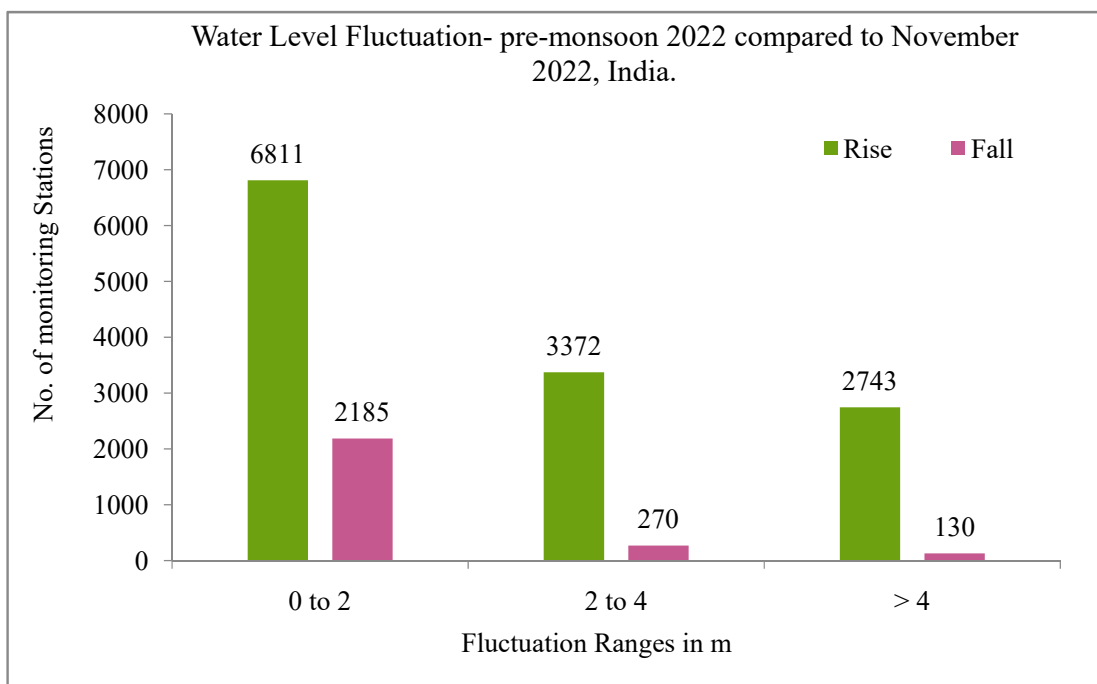
SEASONAL WATER LEVEL FLUCTUATION (PRE-MONSOON 2022- AUGUST
2022)

A comparison of depth to water level of pre-monsoon 2022with August 2022indicates that out of analysed 14945 wells, about 83.3% (12449) of wells are showing rise in water levels, out of which 35.4%(5290) wells are showing rise of less than 2 m range. About 22.0% (3281) wells are showing rise in water level in the range of 2 to 4 m and another 25.9 %(3878) wells are showing rise in water in range of more than 4 m. Similarly,16.0 % (2398) wells are showing decline in water level, out of which 12.6% (1884) wells are showing decline in water in the range of 0 to 2 m, 2.4% (355) wells are showing fall in water level in the range of 2 to 4 m and the remaining 1.1 % (159) wells are showing fall in water level of more than 4 m(**Plate-XVI, Annexure-IX**). Rise in water level more than 4 m is mostly prominent all over the country covering in all the states. Fall of 2 to 4m or more is observed in Haryana, Jharkhand, Punjab, Madhya Pradesh, parts of Maharashtra, Gujarat and Rajasthan.



SEASONAL WATER LEVEL FLUCTUATION (PRE-MONSOON 2022- NOVEMBER 2022)

A comparison of depth to water level of pre-monsoon 2022 with November 2022 indicates that about 82.8% of wells (12926) analysed are showing rise in water levels, out of which 43.7% (6811) wells are showing rise of less than 2 m range. About 21.6 % (3372) wells are showing rise in water level in the range of 2 to 4 m and another 17.6 % (2743) wells are showing rise in water in range of more than 4 m. About 16.6% wells are showing decline in water level, out of which 14.0 % wells (2185) are showing decline in water in the range of 0 to 2 m. Rise in water level is prominent in all the states of the country. Rise in water level of more than 4 m is prominent in the most of the states such as Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh (**Plate XVII, Annexure X**).

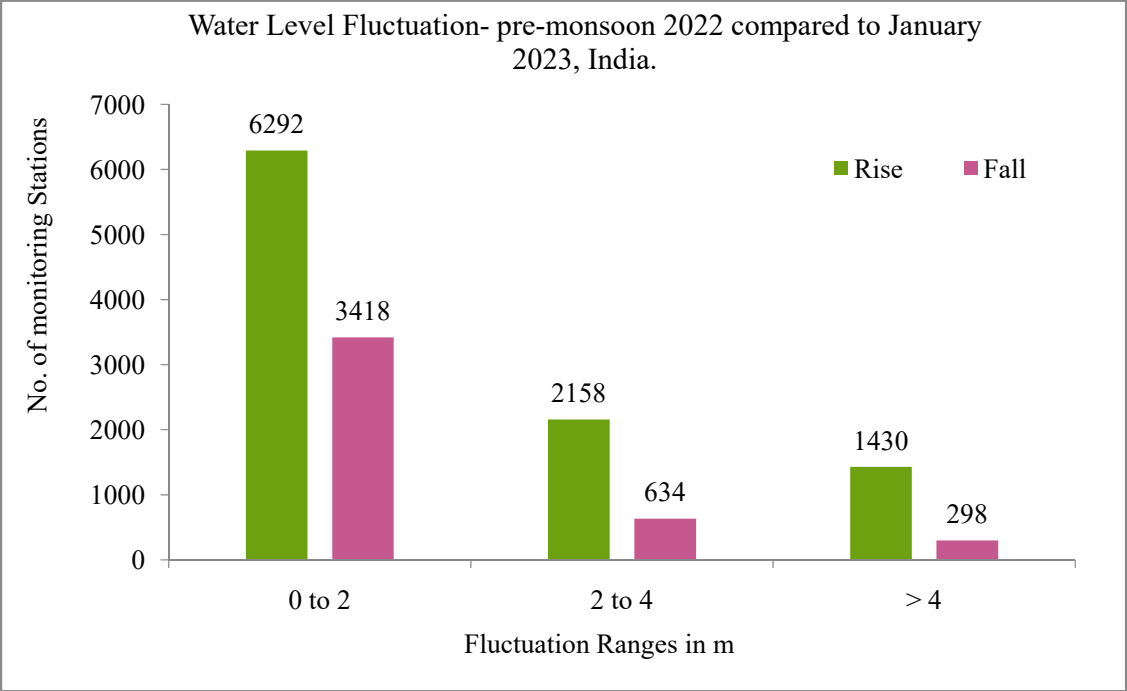


SEASONAL WATER LEVEL FLUCTUATION (PREMONSOON 2022 JANUARY 2023)

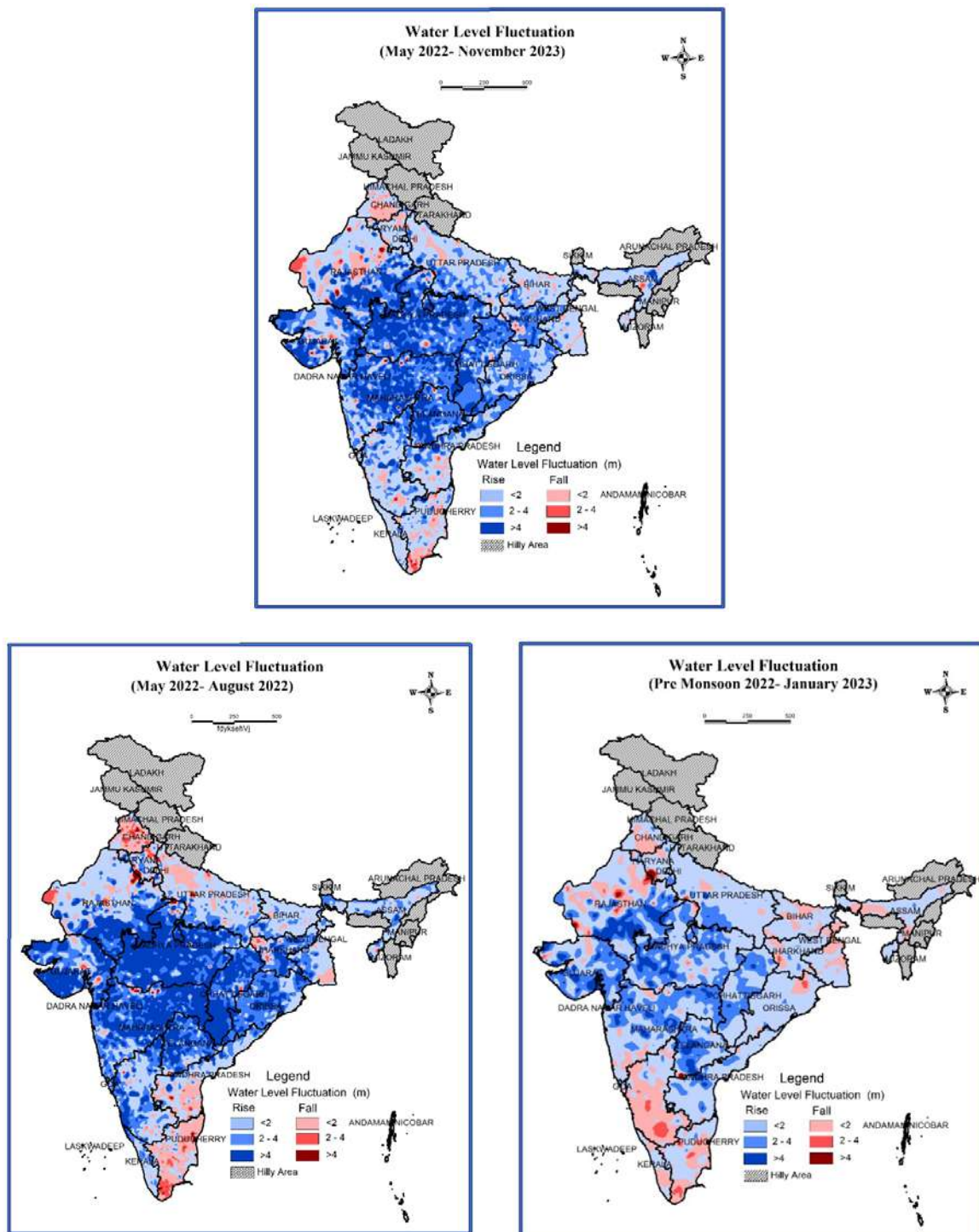
The water level fluctuation of pre-monsoon 2022 with January 2023 indicates that out of 14333 wells analysed, 9880 (68.9%) are showing rise and 4350 (30.3%) are showing fall in water level. Remaining 103 (0.8%) wells analysed do not show any change in water level. About 43.9% (6292) wells are showing rise in the water level in the range of less than 2 m.

About 15.1% (2158) wells are showing rise in water level in 2 to 4 m range and another 10.0% (1430) wells showing rise in water level more than 4 m range. About 30.3% (4350) wells are showing decline in water level, out of which 23.8% (3418) wells are showing decline in water level in less than 2 m range. Majority of the wells showing rise/decline falls in the range of 0 to 2 m (**Plate XVIII, Annexure XI**).

A comparison of depth to water level of pre-monsoon 2022with January 2023 with reveals that in general, there is rise in water level in almost the entire country, except in few states. Rise in water level is prominent in all the states of the country. Rise in water level is prominent in the range of 0 to 2 m.



SEASONAL WATER LEVEL FLUCTUATION AT A GLANCE



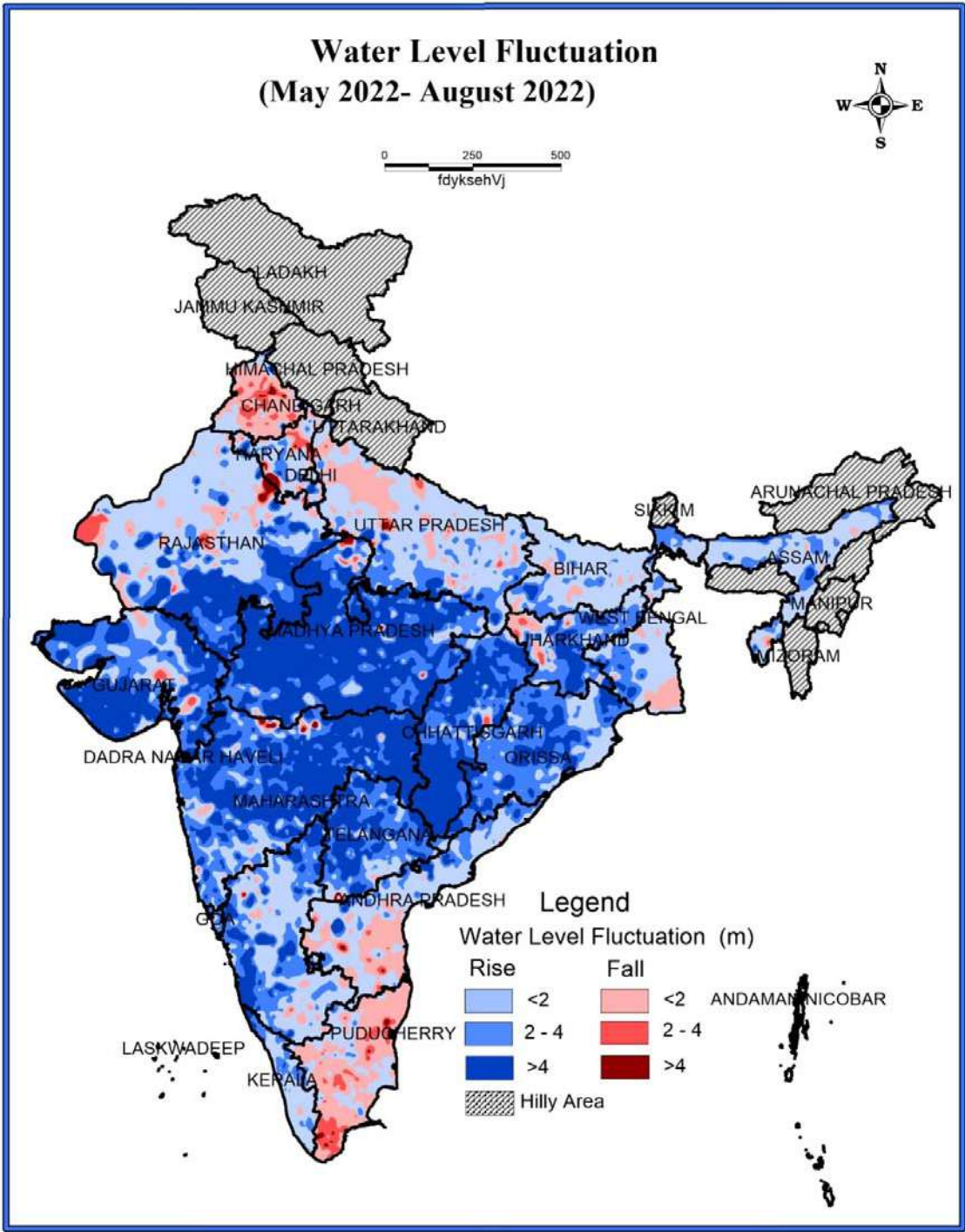
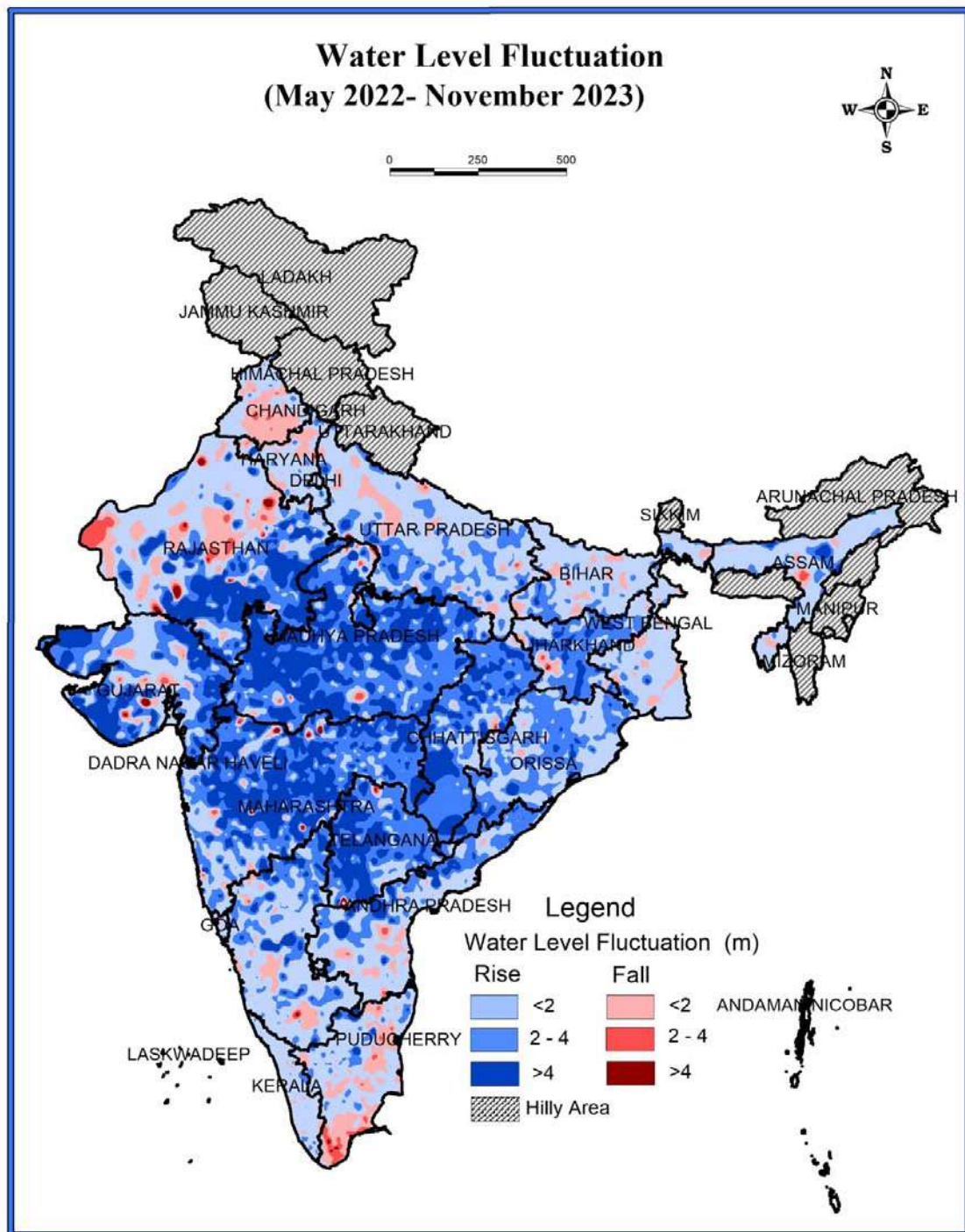
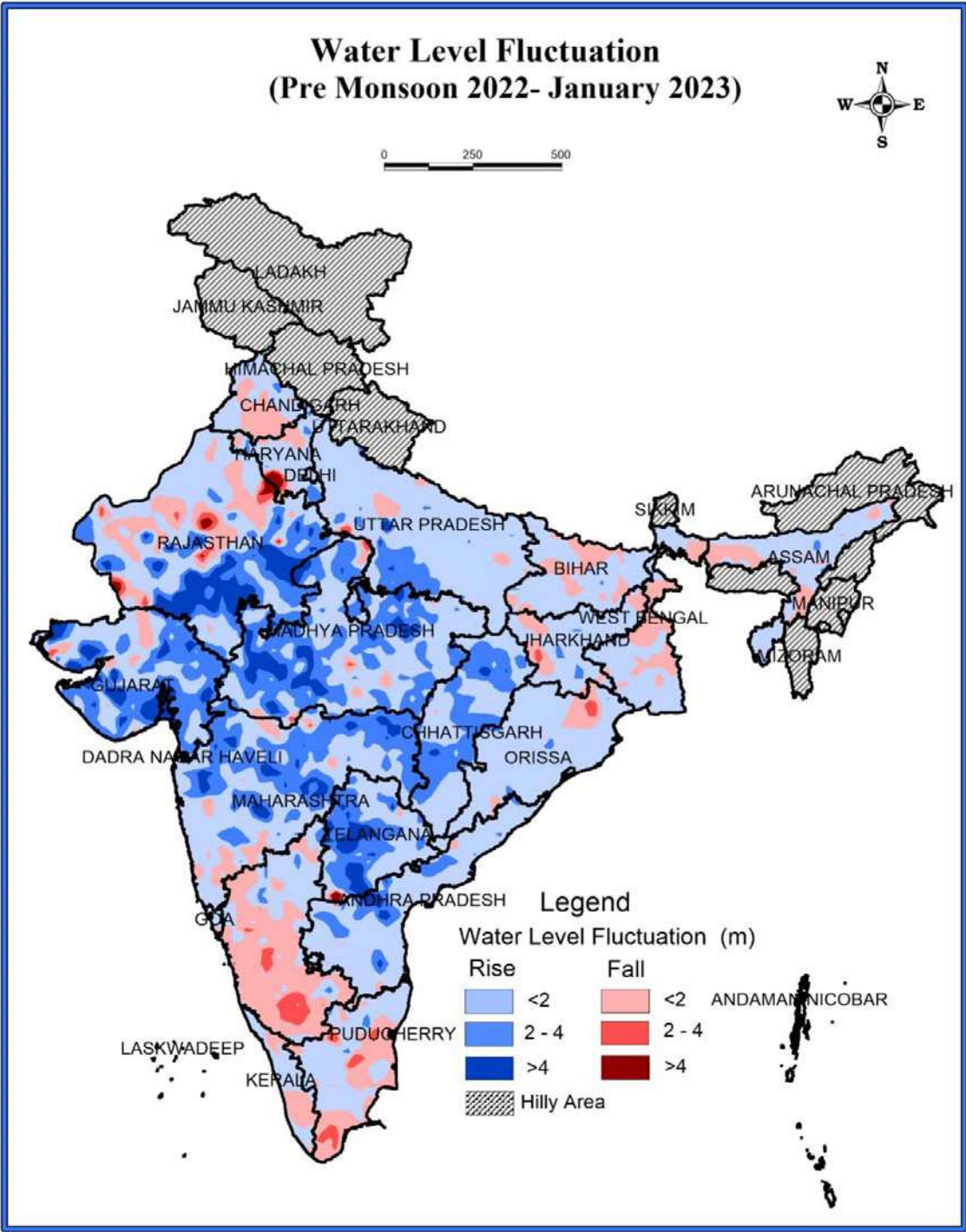


PLATE – XVII



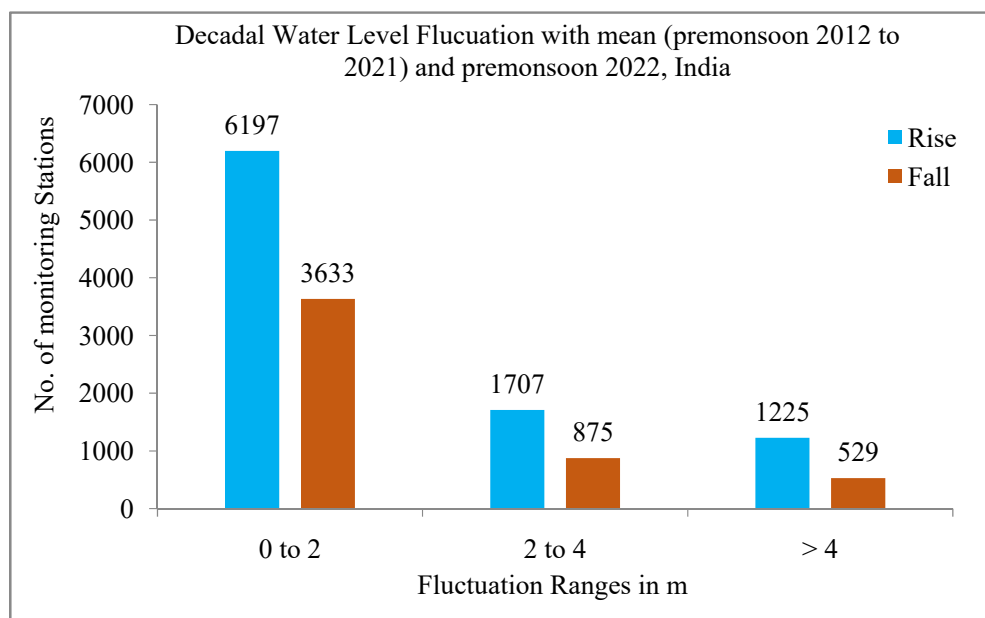


3.2.4 DECADAL WATER LEVEL FLUCTUATION

WATER LEVEL FLUCTUATION WITH DECADAL MEAN (PRE-MONSOON 2012 TO 2021) TO PRE-MONSOON 2022

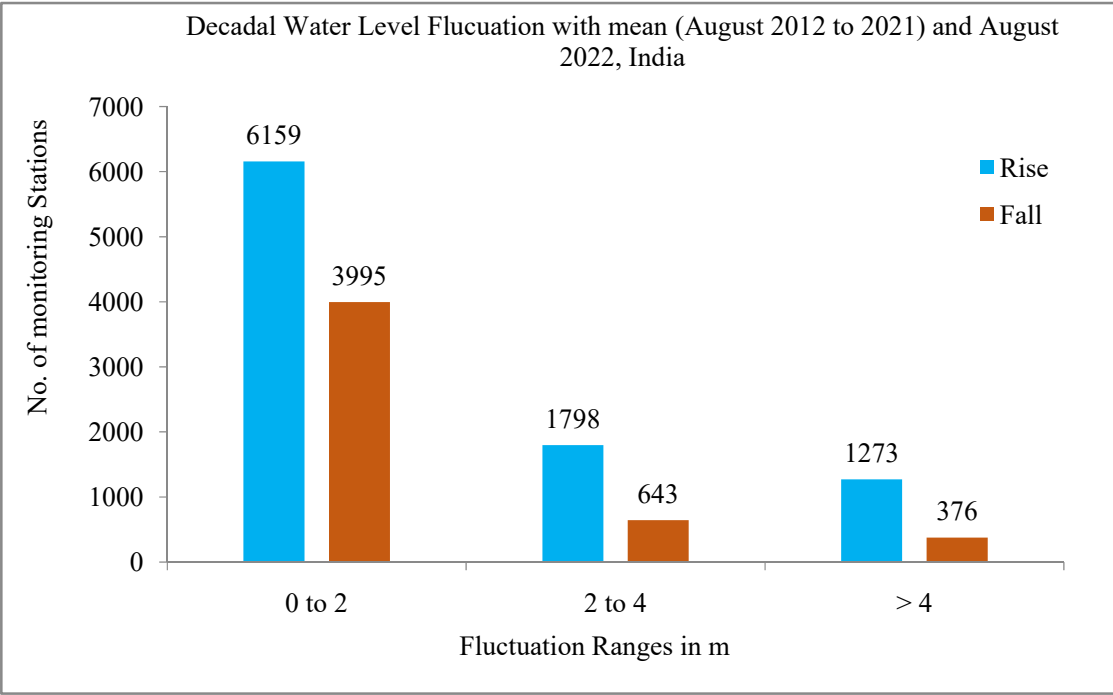
A comparison of depth to water level of pre-monsoon 2022 with decadal mean of pre-monsoon (2012-2021) indicate that 9129 (64.3%) of wells are showing rise in water level, out of which 43.7% (6197) wells are showing rise of less than 2 m. About 12.0% (1707) wells are showing rise in water level in the range of 2 to 4 m and about 8.6% (1225) wells are showing rise in water level in the range of more than 4 m. 5037 (35.5%) wells are showing decline in water level, out of which 25.6% wells are showing decline in water in the range of 0 to 2 m. 6.2% wells are showing decline in water level in 2 to 4 m range and remaining 3.7% (529) are in the range of more than 4 m. A comparison of depth to water level of pre-monsoon 2022 with decadal mean of pre-monsoon (2012-2021) indicates that 64.3% of the analysed wells show rise in water level whereas 35.5% wells show decline in water level. Less than 0.5% well show no change. Rise and decline in water level are primarily in the 0 to 2 m range. More than 50% of the wells analysed have registered rise in groundwater level, mostly in the range of 0 to 4 m, in all the states/UTs.

Decline of more than 4 m has also been observed in pockets in the states/UTs of Chhattisgarh, Delhi, Gujarat, Haryana, Maharashtra, Punjab, Rajasthan, Telangana and Uttarakhand(**Plate-XX, Annexure-XII**).



WATER LEVEL FLUCTUATION WITH DECADAL MEAN (AUGUST 2012 TO AUGUST 2021) TO AUGUST 2022

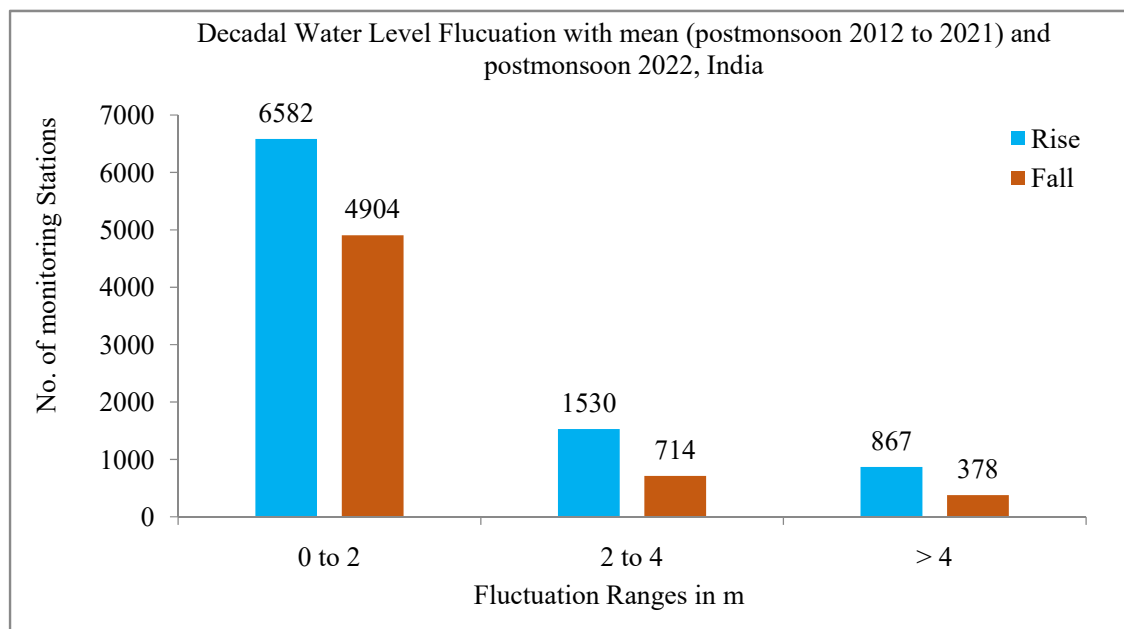
A comparison of depth to water level of August 2022 with decadal mean of August (2012-2021) indicate that about 64.7% (9230) of wells are showing rise in water level, out of which 43.2% (6159) wells are showing rise of less than 2 m. About 12.6% (1798) wells are showing rise in water in the range of 2 to 4 m and about 8.9% (1273) wells are showing rise in water level in the range of more than 4 m. About 35% (5014) wells are showing decline in water level, out of which 28% (3995) wells are showing decline in water in the range of 0 to 2 m. 4.5% (643) wells are showing decline in water level in 2 to 4 m range and remaining 2.6% (376) are in the range of more than 4 m. A comparison of depth to water level of August 2022 with decadal mean of August (2012-2021) indicates that 43.2% of the wells analysed have registered rise in groundwater level, mostly in the range of 0 to 2 m, in the states/UTs namely Arunachal Pradesh, Assam, Bihar, Chandigarh, Dadra Nagar Haveli, Delhi, Haryana, Kerala, Meghalaya, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. Decline of more than 4 m has also been observed in pockets in the states/UTs of Chandigarh, Chhattisgarh, Delhi, Gujarat, Haryana, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand and West Bengal(Plate XXI, *Annexure XIII*).



WATER LEVEL FLUCTUATION WITH DECADAL MEAN (POST- MONSOON-2012 TO POST-MONSOON-2021) TO POST-MONSOON-2022

A comparison of depth to water level of post-monsoon 2022 with decadal mean of post-monsoon (2012-2021) indicate that, out of 14986 wells analysed, 8979 (59.9%) of wells are showing rise in water level, out of which 43.9% (6582) wells are showing rise of less than 2 m. About 10.2% (1530) wells are showing rise in water level in the range of 2 to 4 m and about 5.8% (867) wells are showing rise in water level in the range of more than 4 m. About 5996 (40.0%) wells showing decline in water level, 32.2% (4904) wells are showing decline in water in the range of 0 to 2 m. 4.8%(714) wells are showing decline in water level in 2 to 4 m range and remaining 2.5% (378) are in the range of more than 4 m (**Plate XXII, Annexure-XIV**).

A comparison of depth to water level of post-monsoon 2022 with decadal mean of post-monsoon(2012-2021) indicates that 43.9% of the wells have registered rise in groundwaterlevel, mostly in the range of 0 to 2 m. Rise in water level is widespread in southern India comprising of Maharashtra, Telangana, Andhra Pradesh, Gujarat, Bihar, Jharkhand, eastern Uttar Pradesh, Tamil Nadu, Karnataka and Kerala. Fall in water level within 0 to 2 m range is observed in Madhya Pradesh, Maharashtra, Goa, Chhattisgarh, Odisha and parts of NE states in patches. Decline of more than 4 m has also been observed in pockets in the states/UTs of Chandigarh, Delhi, Gujarat, Haryana, Punjab, Rajasthan and western Uttar Pradesh.



WATER LEVEL FLUCTUATION WITH DECADAL MEAN (JANUARY 2013 TO JANUARY 2022) TO JANUARY 2023

A comparison of depth to water level of January 2023 with decadal mean of January (2013-2022) indicates that out of 14283 well analysed, 8073 (about 56.5%) of wells are showing rise in water level, out of which 41.8% (5966) wells are showing rise of less than 2 m. About 9.1% (1305) wells are showing rise in water level in the range of 2 to 4 m and only 5.6% (802) wells are showing rise in the range of more than 4 m. Total 6201 (about 43.3%) wells showing decline in water level, 35.1% (5019) wells are showing decline in water in the range of 0 to 2 m. 5.6% (802) wells are showing decline in water level in 2 to 4 m range and remaining 2.9% (410) are in the range of more than 4 m. Rise in water level is observed in major portions of peninsular India in 0 to 4 m range and more than 4 m is seen in southern states Telangana, Andhra Pradesh, Kerala and Tamil Nadu. Decline in water level is observed in north eastern states Arunachal Pradesh, Tripura, Assam. In rest of India fall in water level is recorded in Bihar, Chandigarh, Goa, Punjab, Karnataka, Odisha and Rajasthan (**Plate XXIII, Annexure-XV**).

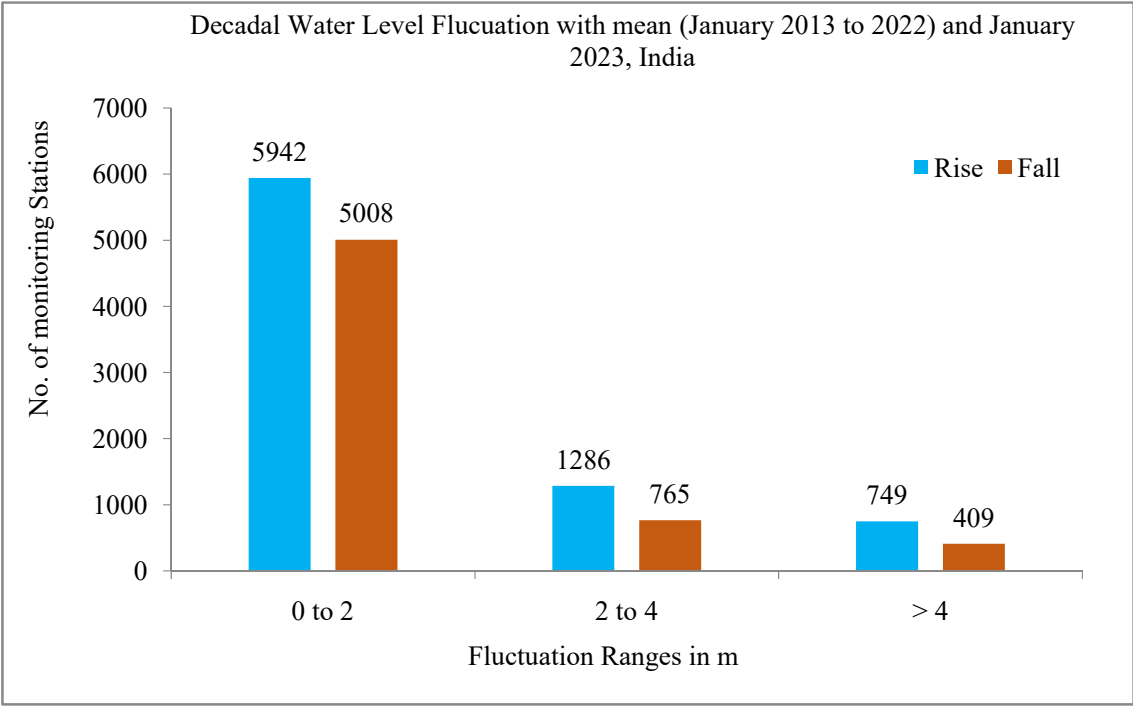


PLATE – XIX

DECADAL WATER LEVEL FLUCTUATION AT A GLANCE

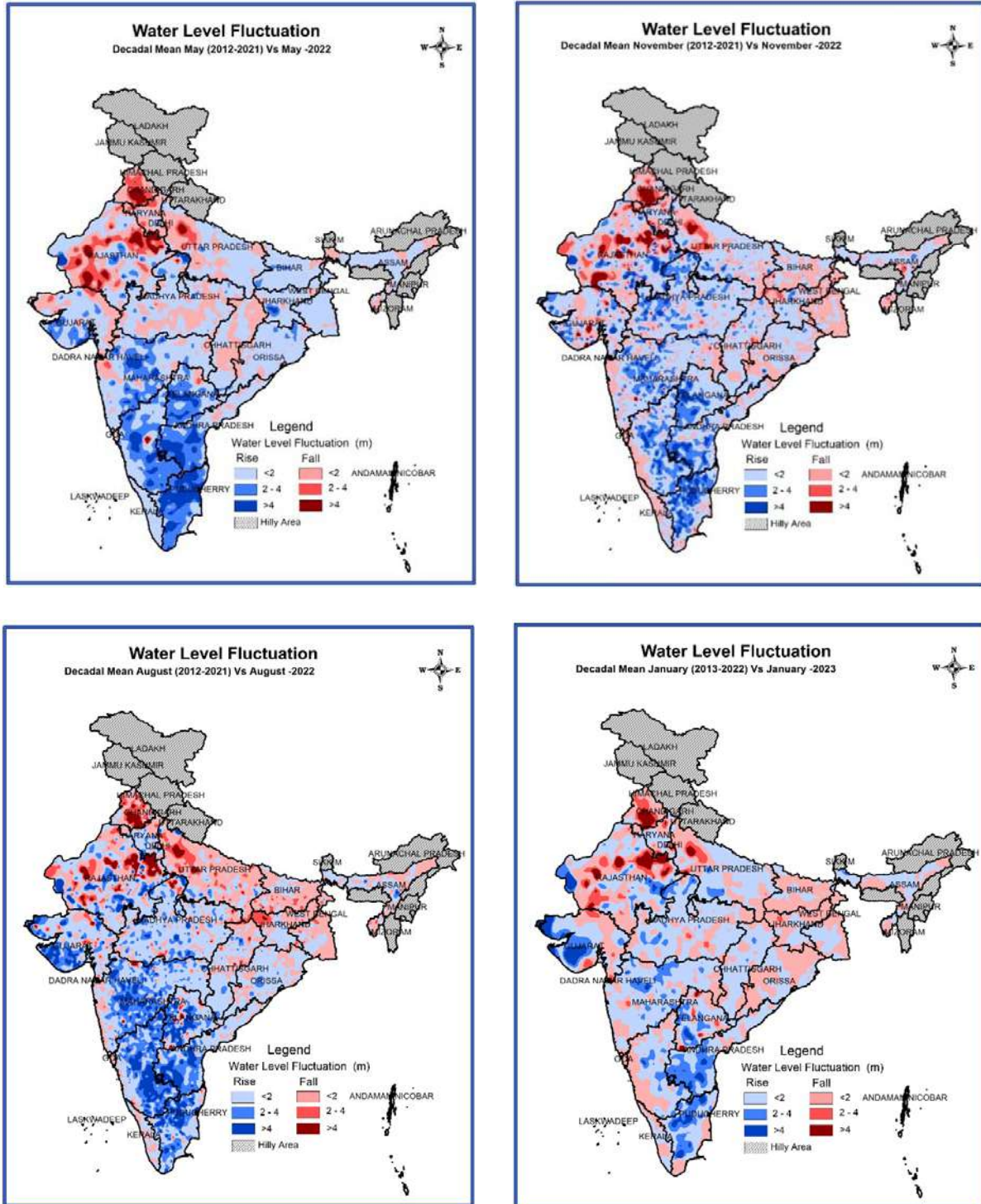


PLATE – XX

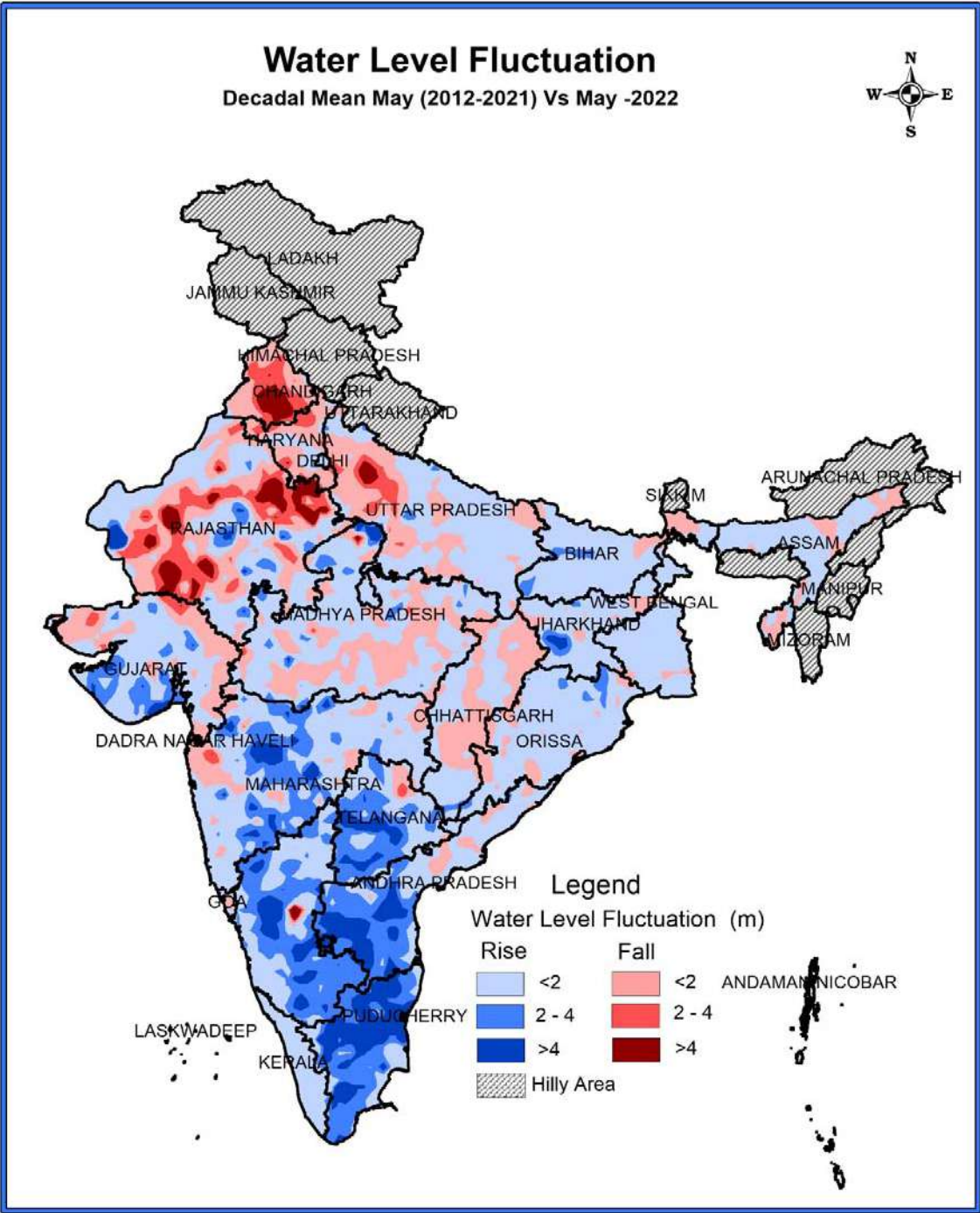


PLATE – XXI

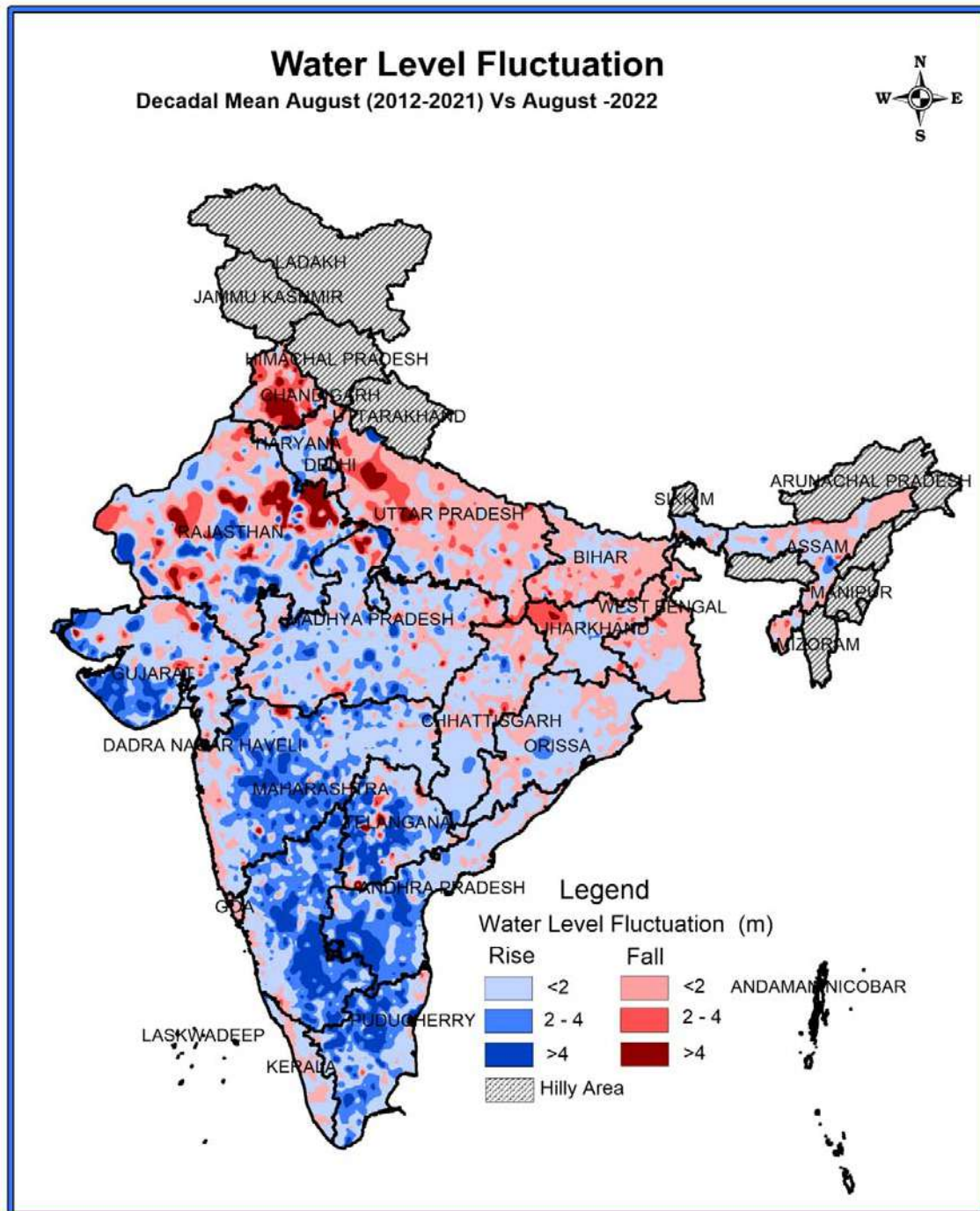


PLATE -XXII

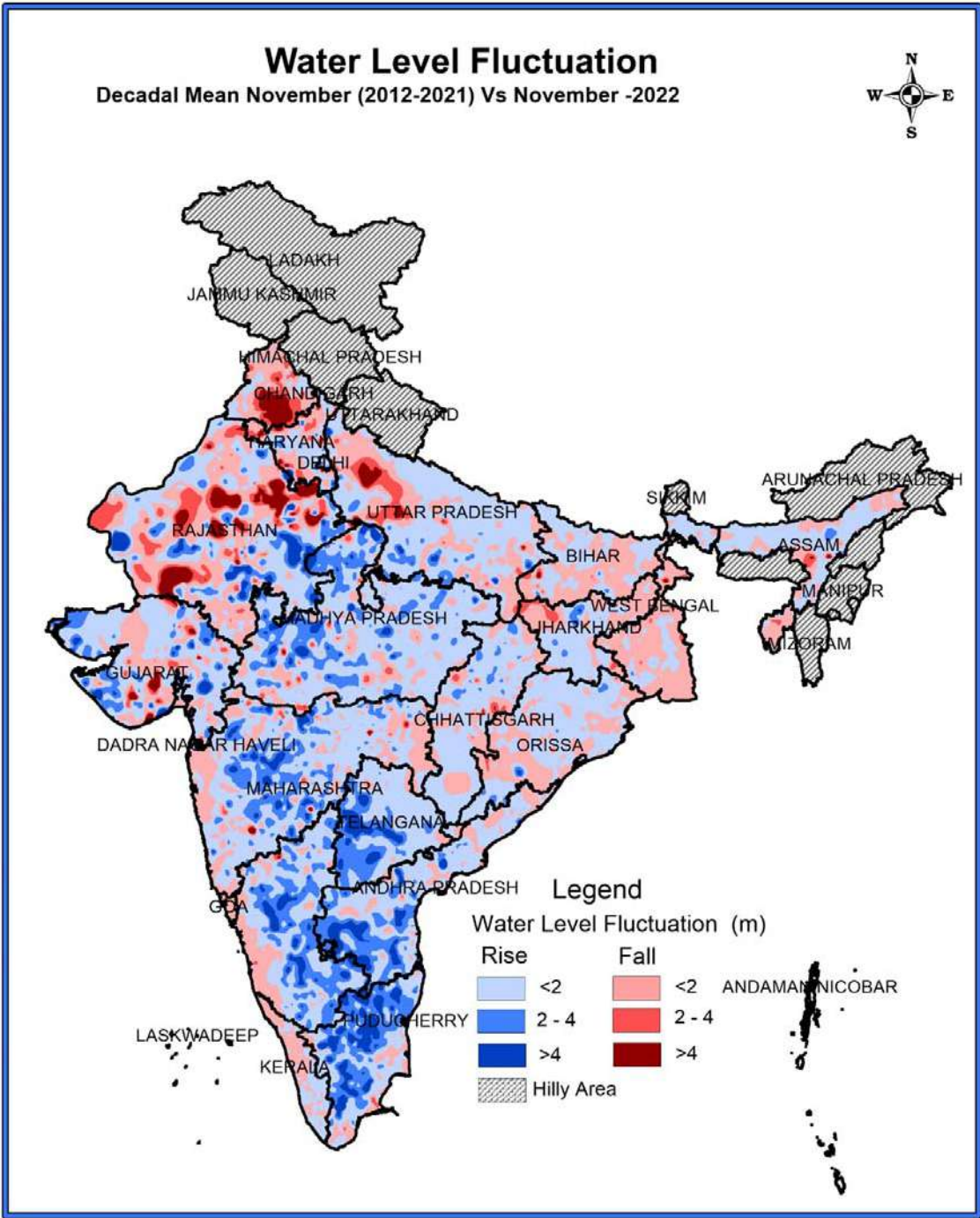
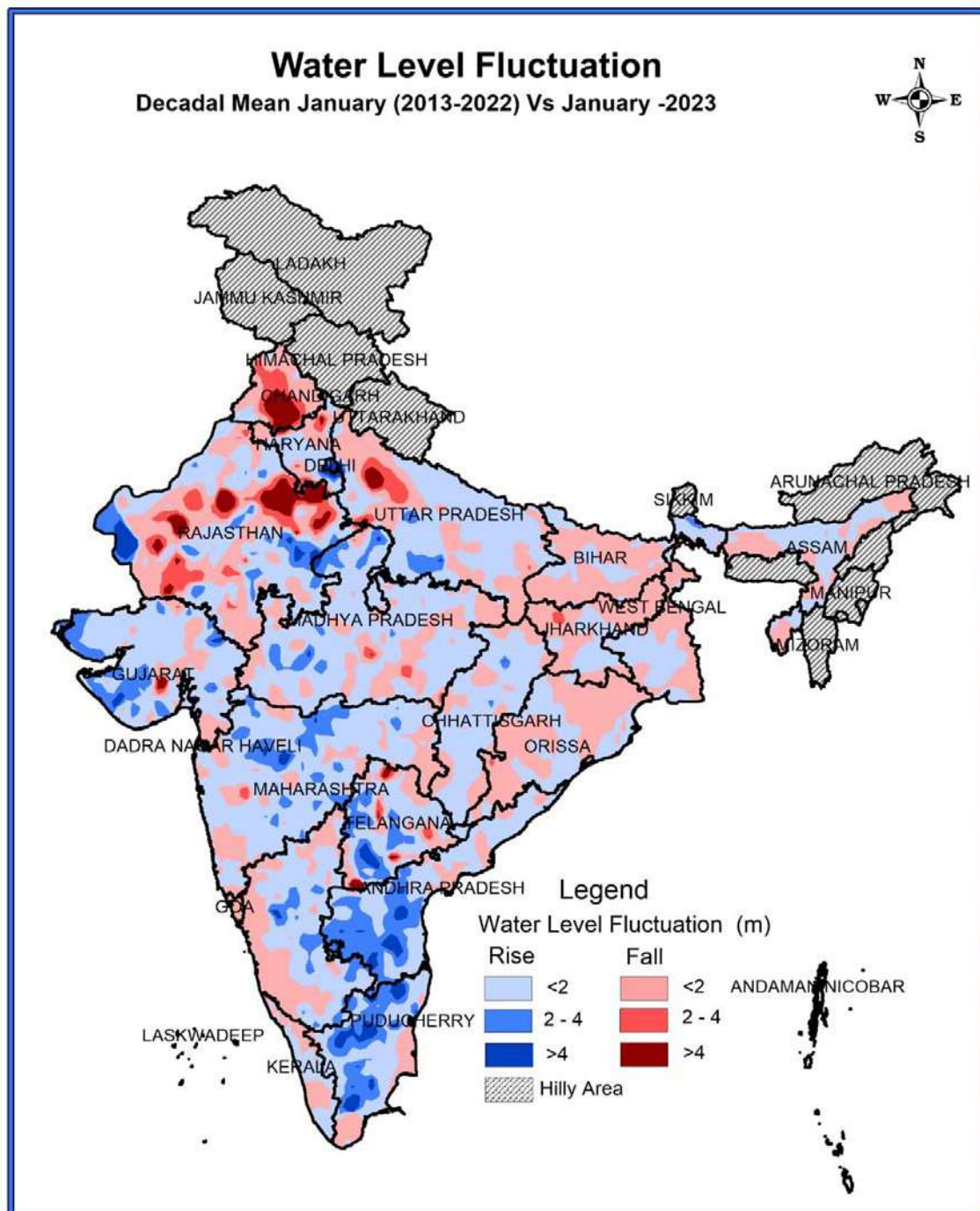


PLATE – XXIII

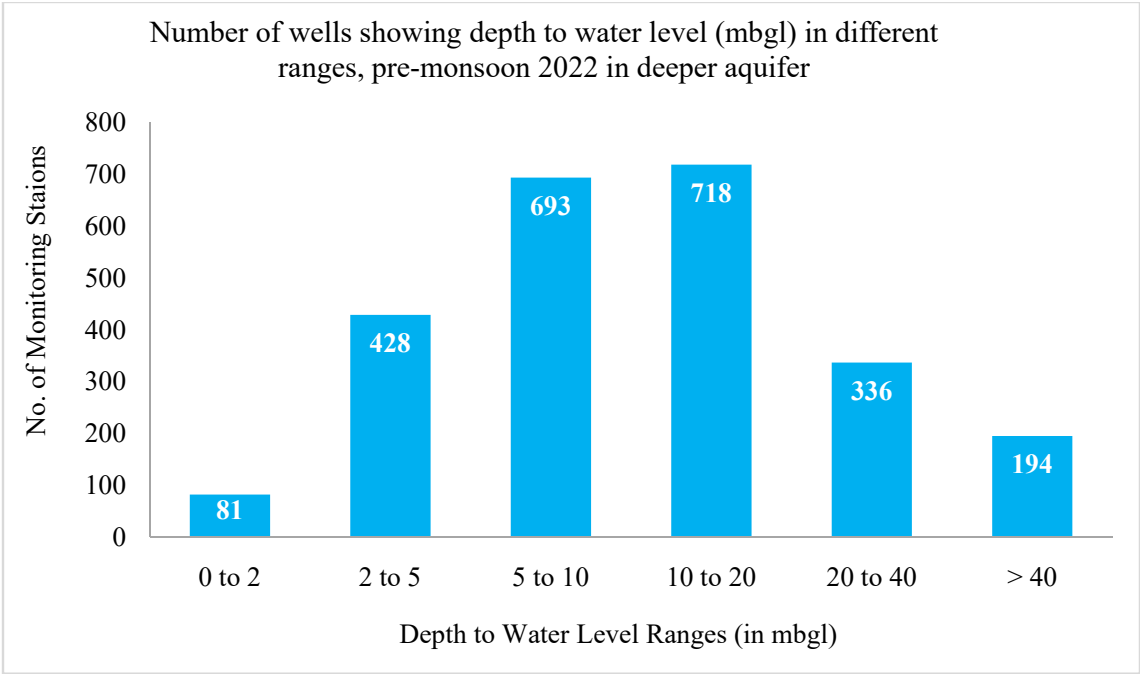


3.3GROUNDWATER REGIME IN DEEPER AQUIFER

3.3.1 DEPTH TO WATER LEVEL IN DEEPER AQUIFER

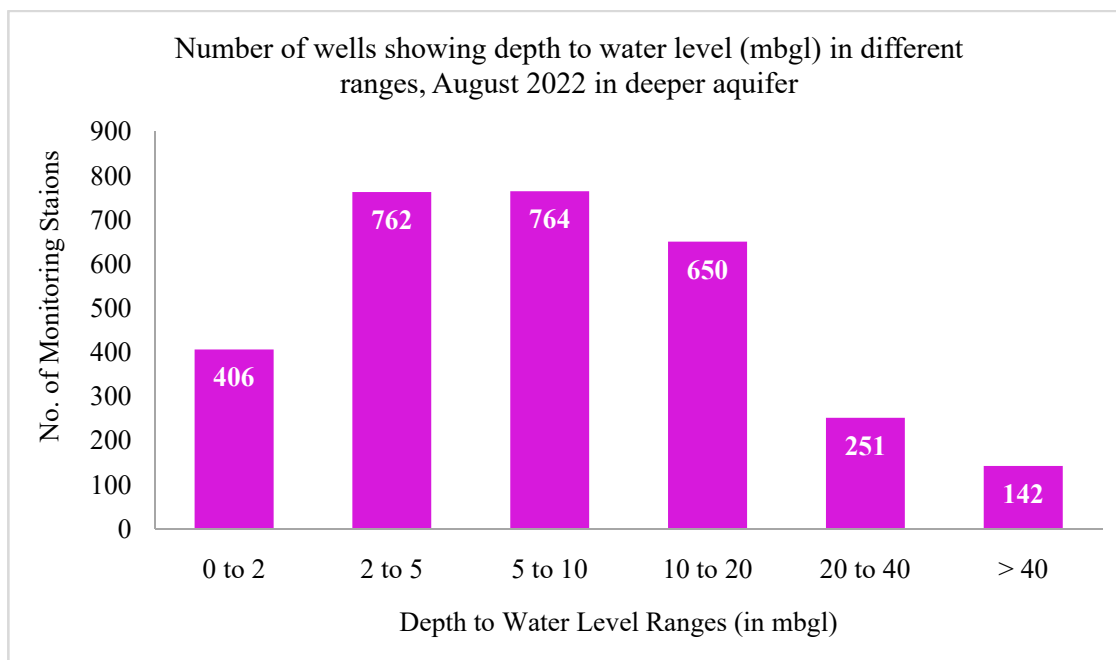
DEPTH TO WATER LEVEL – PRE-MONSOON 2022 IN DEEPER AQUIFER

The groundwater level data(*Annexure-XVI*)of deeper aquifers for pre-monsoon 2022 indicates that out of the total 2450 wells analysed, 81 (3.3%) wells are showing water level less than 2 m bgl, 428(17.5%) wells are showing water level in the depth range of 2 to 5 m bgl, 693(28.3%) wells are showing water level in the depth range of 5 to 10 m bgl, 718 (29.3%) wells are showing water level in the depth range of 10 to 20 m bgl,336 (13.7%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 194 (7.9%) wells are showing water level more than 40 m bgl. Thus, the general range of water level is between 5 to 20m. From the analysis of the data, it’s also revealed that deeper piezometric level of more than 40 m is observed in Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal, Delhi and Puducherry.



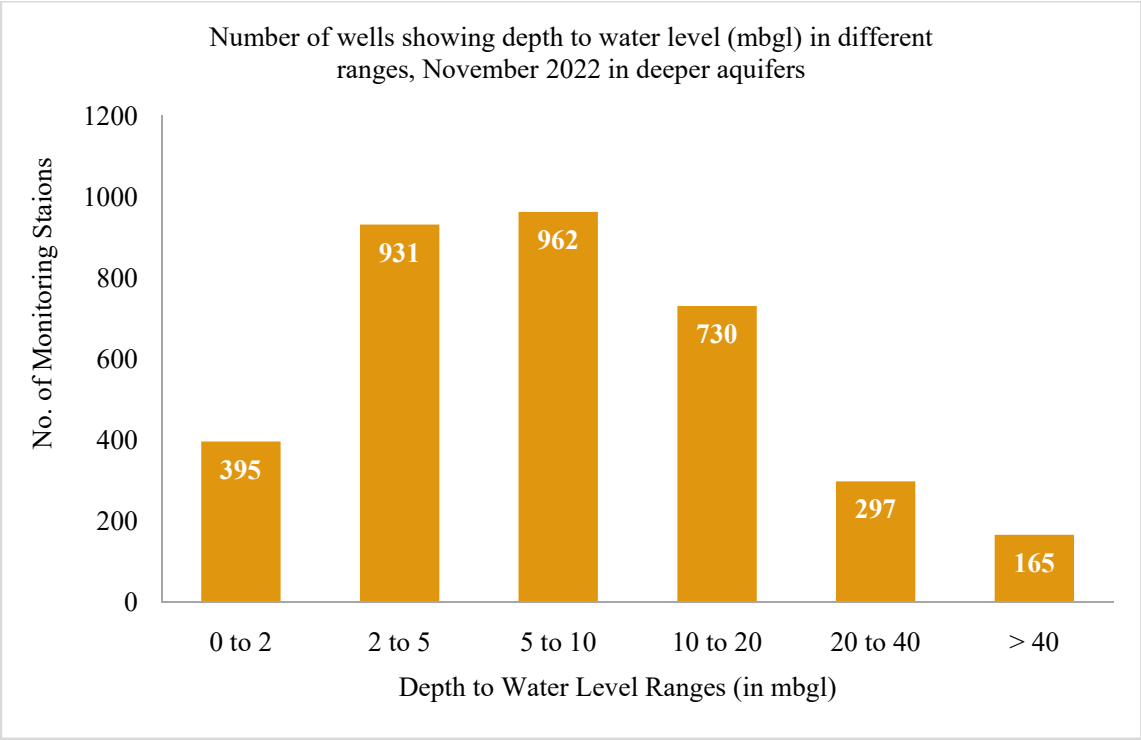
DEPTH TO WATER LEVEL – AUGUST 2022 IN DEEPER AQUIFER

The groundwater level data(**Annexure-XVII**) of deeper aquifers for August 2022 indicates that out of the total 2975 wells analysed, 406 (13.6%) wells are showing water level less than 2 m bgl, 762(25.6%) wells are showing water level in the depth range of 2 to 5 m bgl, 764 (25.7%) wells are showing water level in the depth range of 5 to 10 m bgl, 650 (21.8%) wells are showing water level in the depth range of 10 to 20 m bgl, 251 (8.4%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 142 (4.8%) wells are showing water level more than 40 m bgl. Thus, the general range of water level is between 2 to 10m. From the analysis of the data, it's also revealed that deeper piezometric level of 20 to 40 m is observed in Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Punjab, Tamil Nadu, West Bengal, Chandigarh, Delhi and Puducherry. Deeper piezometric level of more than 40 m is observed Andhra Pradesh, Gujarat, Haryana, Punjab, Tamil Nadu, Uttarakhand, Chandigarh and Delhi.



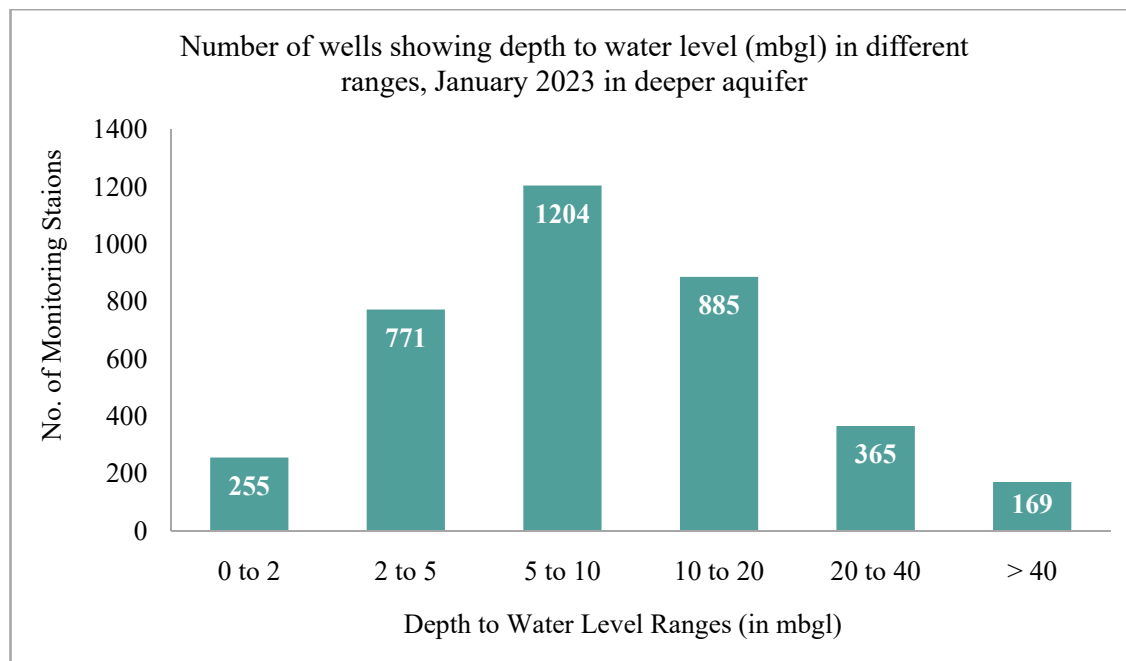
DEPTH TO WATER LEVEL – NOVEMBER 2022 IN DEEPER AQUIFER

The groundwater level data(*Annexure-XVIII*) of deeper aquifers for November 2022, indicates that out of the total 3480 wells analysed, 395(11.4%) wells are showing water level less than 2 m bgl,931(26.8%) wells are showing water level in the depth range of 2 to 5 m bgl, 962 (27.6%) wells are showing water level in the depth range of 5 to 10 m bgl, 730 (21.0%) wells are showing water level in the depth range of 10 to 20 m bgl,297 (8.5%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 165 (4.7%) wells are showing water level more than 40 m bgl. Thus, the general range of water level is between 2 to 10m. From the analysis of the data, it’s also revealed that deeper piezometric level of 20 to 40 m is observed inAndhra Pradesh, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal, Chandigarh, Delhi and Puducherry;and more than 40m in Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Karnataka, Maharashtra, Punjab, Tamil Nadu, Telangana, Uttarakhand, Chandigarh and Delhi



DEPTH TO WATER LEVEL – JANUARY 2023 IN DEEPER AQUIFER

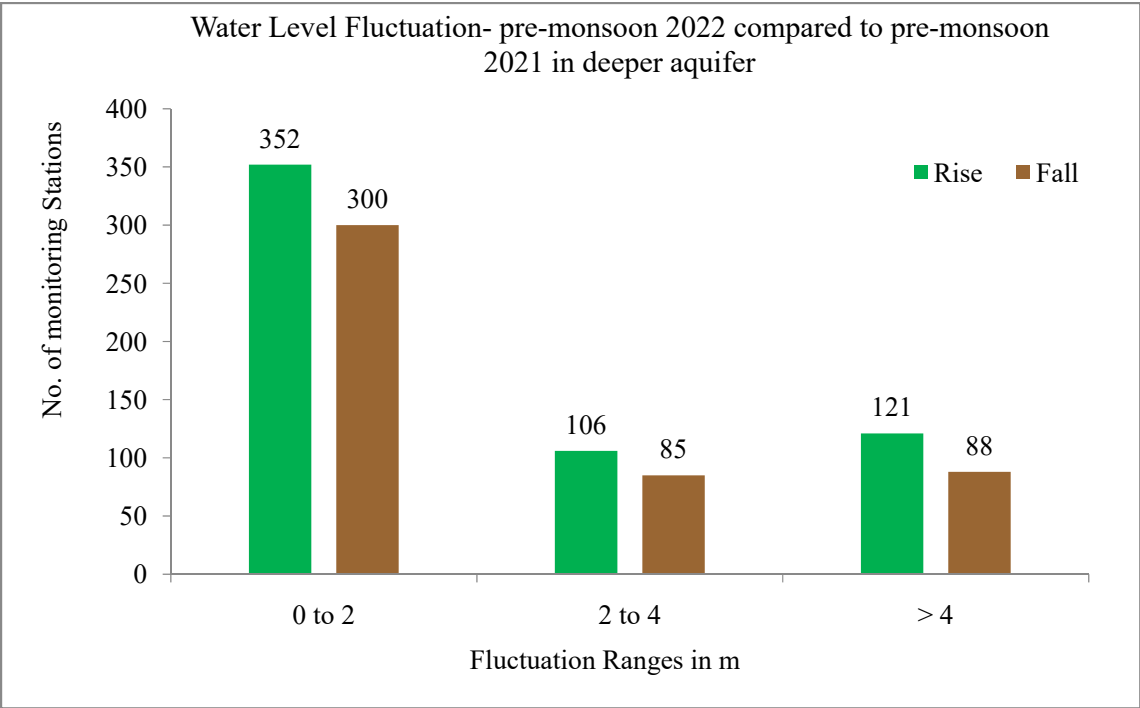
The groundwater level data (**Annexure-XIX**) of deeper aquifers for January 2023, indicates that out of the total 3649 wells analysed, 255 (7.0%) wells are showing water level less than 2 m bgl, 771 (21.1%) wells are showing water level in the depth range of 2 to 5 m bgl, 1204 (33.0%) wells are showing water level in the depth range of 5 to 10 m bgl, 885 (24.3%) wells are showing water level in the depth range of 10 to 20 m bgl, 365 (10.0%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 169 (4.6%) wells are showing water level more than 40 m bgl. Thus, the general range of water level is between 2 to 10m. From the analysis of the data, it's also revealed that deeper piezometric level of 20 to 40 m is observed in Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal, Chandigarh, Delhi and Puducherry and more than 40 m in Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Telangana, Uttarakhand, Chandigarh and Delhi.



3.3.2 ANNUAL WATER LEVEL FLUCTUATION IN DEEPER AQUIFER

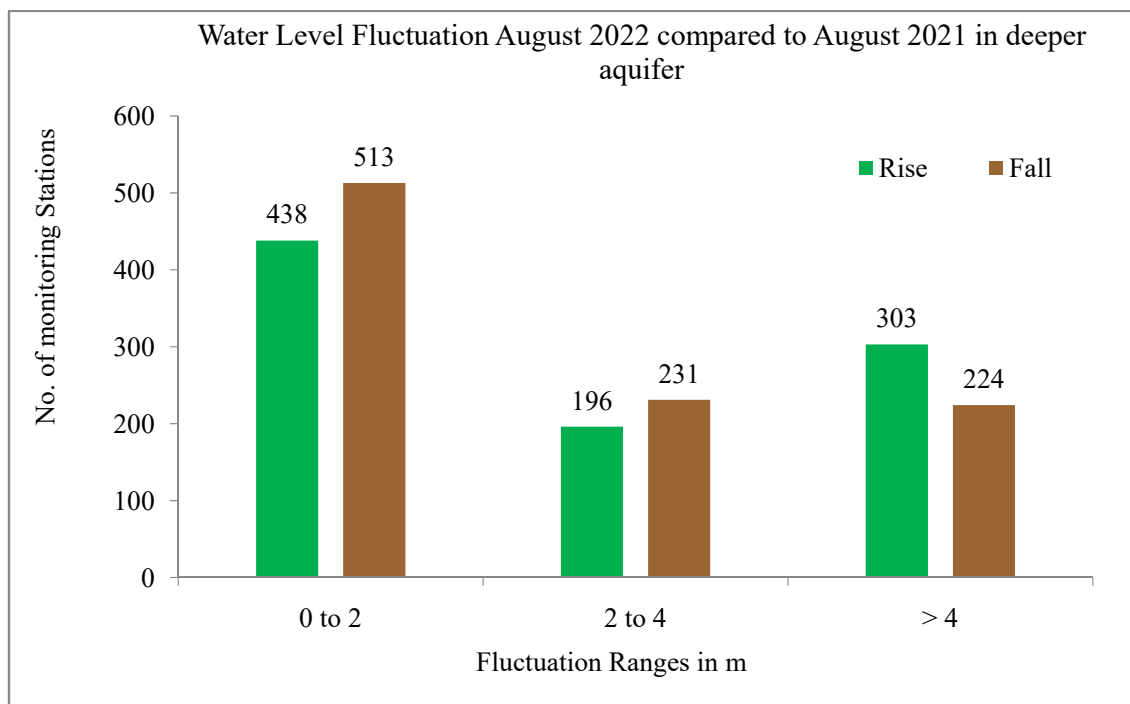
ANNUAL WATER LEVEL FLUCTUATION (PREMONSOON 2022 - PREMONSOON 2021)

A comparison of depth to water level of pre-monsoon 2022with pre-monsoon 2021 reveals that out of total 1054 wells analysed (**Annexure-XX**), 579 (54.9%) of wells are showing rise in water level, among which 33.4% (352) wells are showing rise of less than 2 m. About 10.1% (106) wells are showing rise in water level in the range of 2 to 4 m and 11.5% (121) wells are showing rise in the range of more than 4 m. Among the 473 (44.9%) wells showing decline in water level, 28.5% (300) wells are showing decline in water in the range of 0 to 2 m. 8.1% (85) wells are showing decline in water level in 2 to 4 m range and remaining 8.3% (88) are in the range of more than 4 m. Rise in water level in majority of wells observed in Assam, Kerala, Odisha, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal, Delhi and Jammu and Kashmir. Similarly fall in significant number of wells is observed in Arunachal Pradesh, Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Punjab and Puducherry.



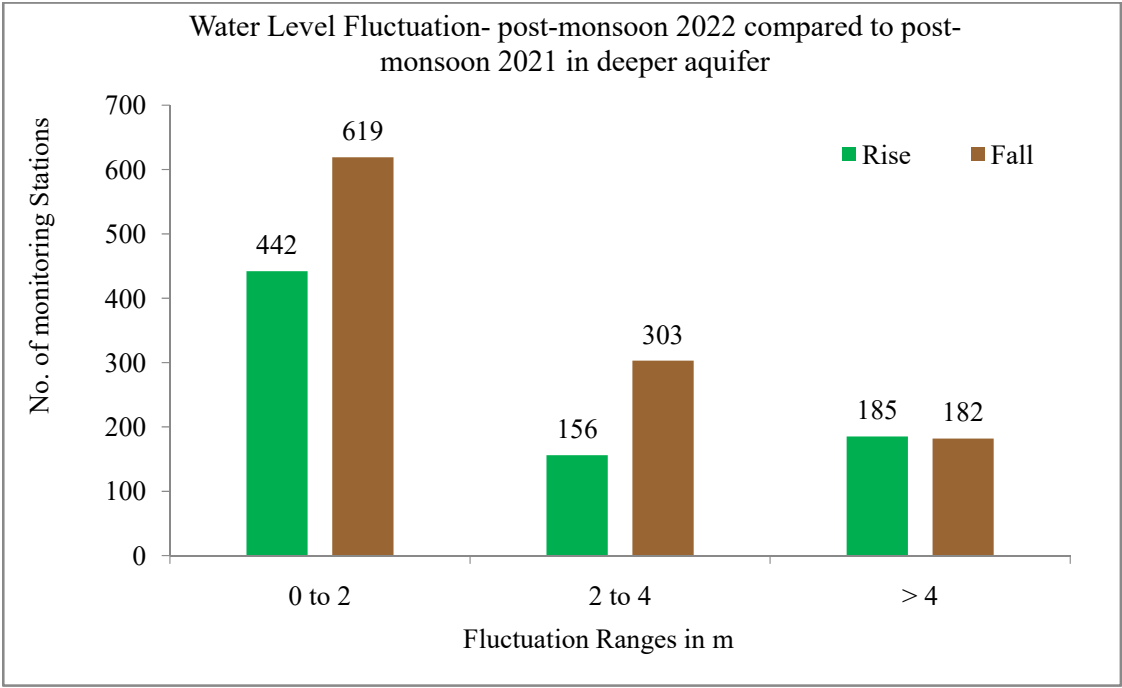
ANNUAL WATER LEVEL FLUCTUATION (AUGUST 2022 - AUGUST 2021)

A comparison of depth to water level of August 2022 with August 2021 reveals that out of total 1956 wells analysed (**Annexure-XXI**), 937 (47.9%) of wells are showing rise in water level, among which 22.4% (438) wells are showing rise of less than 2 m. About 10.0% (196) wells are showing rise in water level in the range of 2 to 4 m and 15.5% (303) wells are showing rise in the range of more than 4 m. Among the 968 (49.5%) wells showing decline in water level, 26.2% (513) wells are showing decline in water in the range of 0 to 2 m. 11.8% (231) wells are showing decline in water level in 2 to 4 m range and remaining 11.5% (224) are in the range of more than 4 m. Rise in water level in majority of wells observed in Andhra Pradesh, Chhattisgarh, Goa, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Chandigarh, Delhi, Jammu and Kashmir and Puducherry. Similarly fall in significant number of wells is observed in Assam, Bihar, Meghalaya, Telangana and West Bengal.



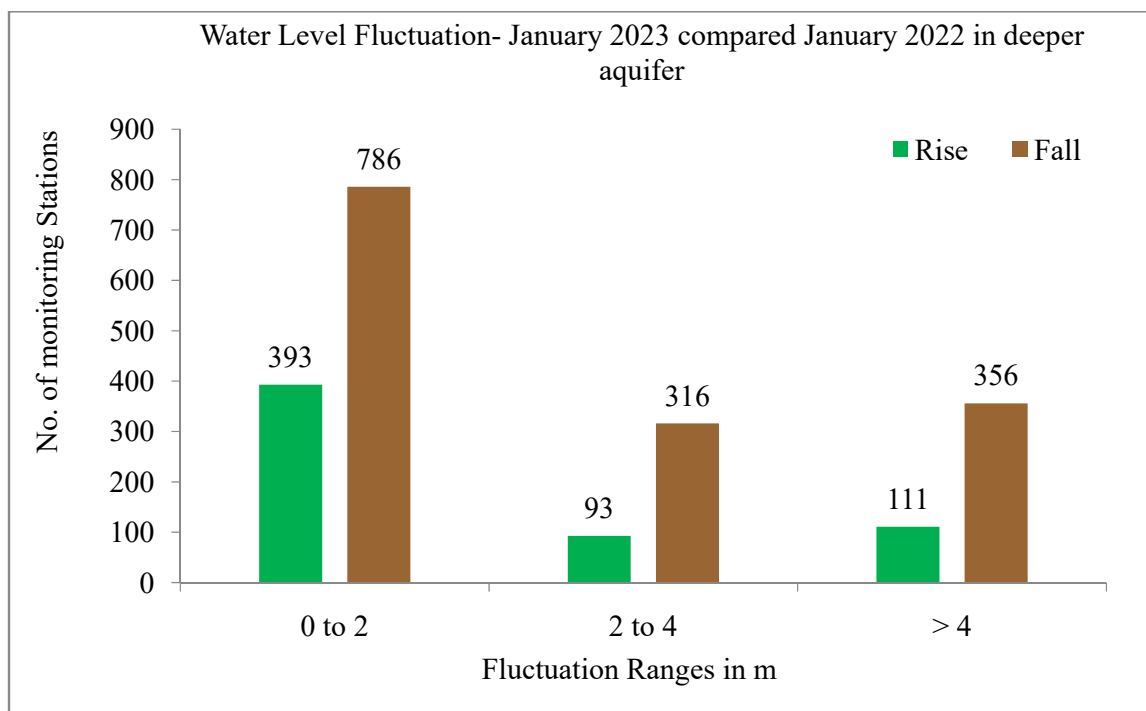
ANNUAL WATER LEVEL FLUCTUATION (NOVEMBER 2022 - NOVEMBER 2021)

A comparison of depth to water level of November2022with November2021 reveals that out of total 1900 wells analysed (*Annexure-XXII*), 783 (41.2%) of wells are showing rise in water level, among which 23.3% (442) wells are showing rise of less than 2 m. About 8.2% (156) wells are showing rise in water level in the range of 2 to 4 m and 9.7% (185) wells are showing rise in the range of more than 4 m. Among the 1104 (58.1%) wells showing decline in water level, 32.6% (619) wells are showing decline in water in the range of 0 to 2 m. 15.9% (303) wells are showing decline in water level in 2 to 4 m range and remaining 9.6% (182) are in the range of more than 4 m. Rise in water level in majority of wells observed in Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Madhya Pradesh, Meghalaya, Odisha, Telangana and Puducherry. Similarly fall in significant number of wells is observed in Chhattisgarh, Goa, Haryana, Jharkhand, Kerala, Tamil Nadu, West Bengal and Chandigarh.



ANNUAL WATER LEVEL FLUCTUATION (JANUARY 2023 - JANUARY 2022)

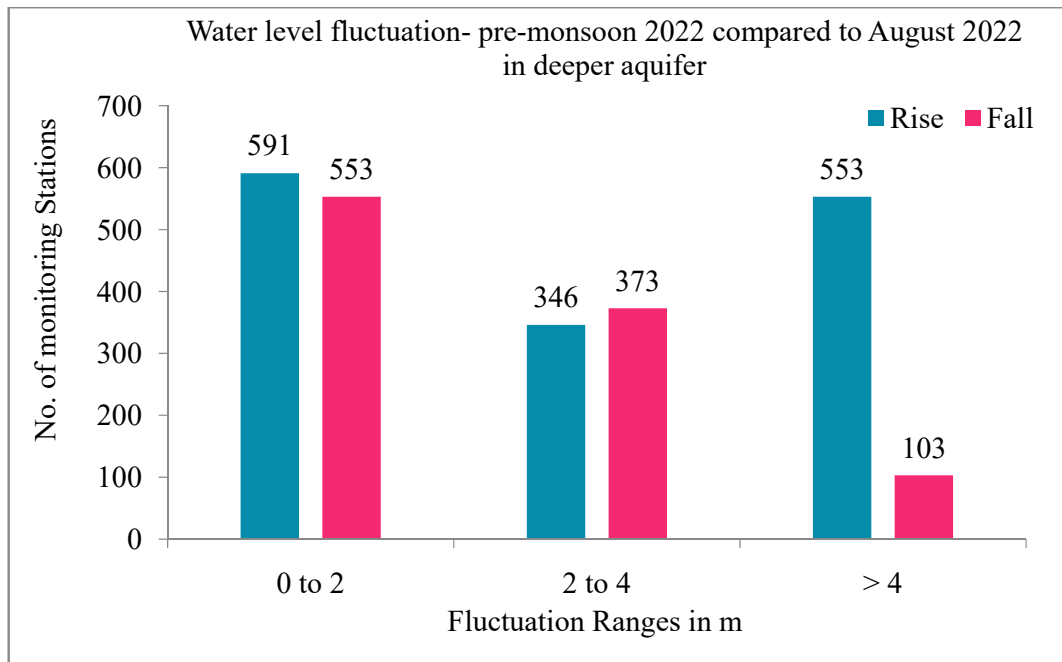
A comparison of depth to water level of January 2023 with January 2022 reveals that out of total 2068 wells analysed (**Annexure-XXIII**), 597 (28.9%) of wells are showing rise in water level, among which 19.0% (393) wells are showing rise of less than 2 m. About 4.5% (93) wells are showing rise in water level in the range of 2 to 4 m and 5.4% (111) wells are showing rise in the range of more than 4 m. Among the 1458 (70.5%) wells showing decline in water level, 38.0% (786) wells are showing decline in water in the range of 0 to 2 m. 15.3% (316) wells are showing decline in water level in 2 to 4 m range and remaining 17.2% (356) are in the range of more than 4 m. Rise in water level in majority of wells observed in Assam, Meghalaya, Chhattisgarh and Chandigarh. Similarly fall in significant number of wells is observed in Andhra Pradesh, Goa, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Telangana and West Bengal



3.2.3 SEASONAL WATER LEVEL FLUCTUATION IN DEEPER AQUIFER

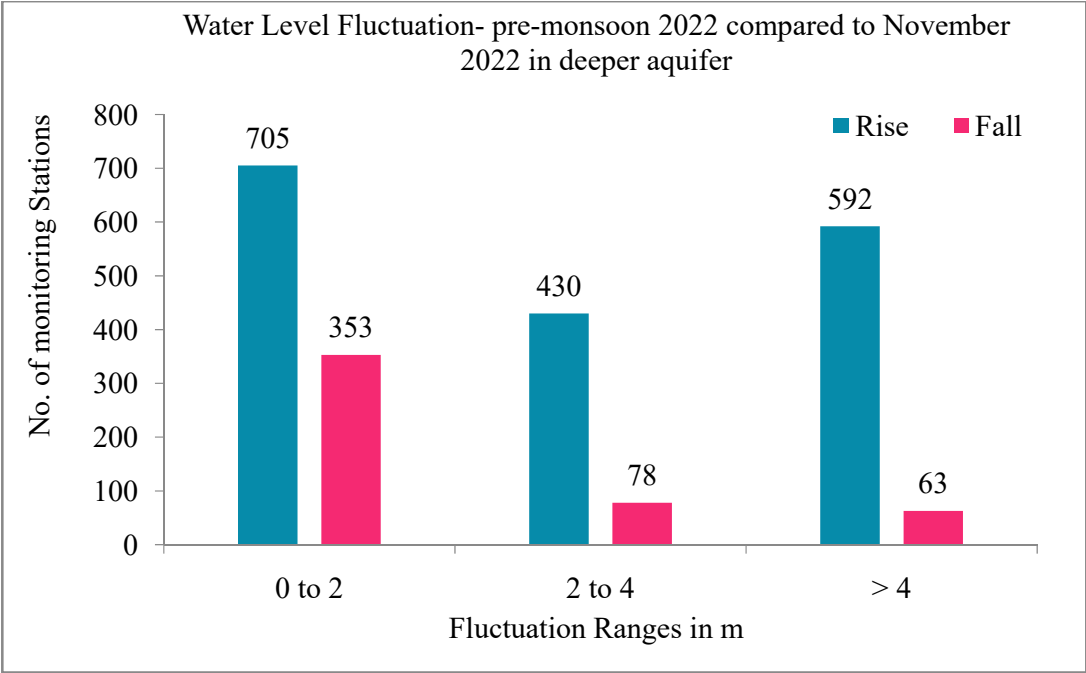
SEASONAL WATER LEVEL FLUCTUATION (PRE-MONSOON 2022- AUGUST 2022)

A comparison of depth to water level of pre-monsoon 2022 with August 2022 indicates that out of analysed 2086 wells (**Annexure-XXIV**), about 71.4% (1490) of wells are showing rise in water levels, out of which 28.3% (591) wells are showing rise of less than 2 m range. About 16.6% (346) wells are showing rise in water level in the range of 2 to 4 m and another 26.5% (553) wells are showing rise in water in range of more than 4 m. Similarly, 28.0% (584) wells are showing decline in water level, out of which 17.9% (373) wells are showing decline in water in the range of 0 to 2 m, 4.9% (103) wells are showing fall in water level in the range of 2 to 4 m and the remaining 5.2% (108) wells are showing fall in water level of more than 4 m. Rise in water level more than 4 m is mostly prominent all over the country covering in all the states except Haryana, Punjab, Tamil Nadu and Chandigarh. Fall of 2 to 4 m or more is observed in Andhra Pradesh, Gujarat, Haryana, Punjab, Tamil Nadu and West Bengal. Rise in water levels is observed in Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Telangana, West Bengal, Delhi and Jammu and Kashmir.



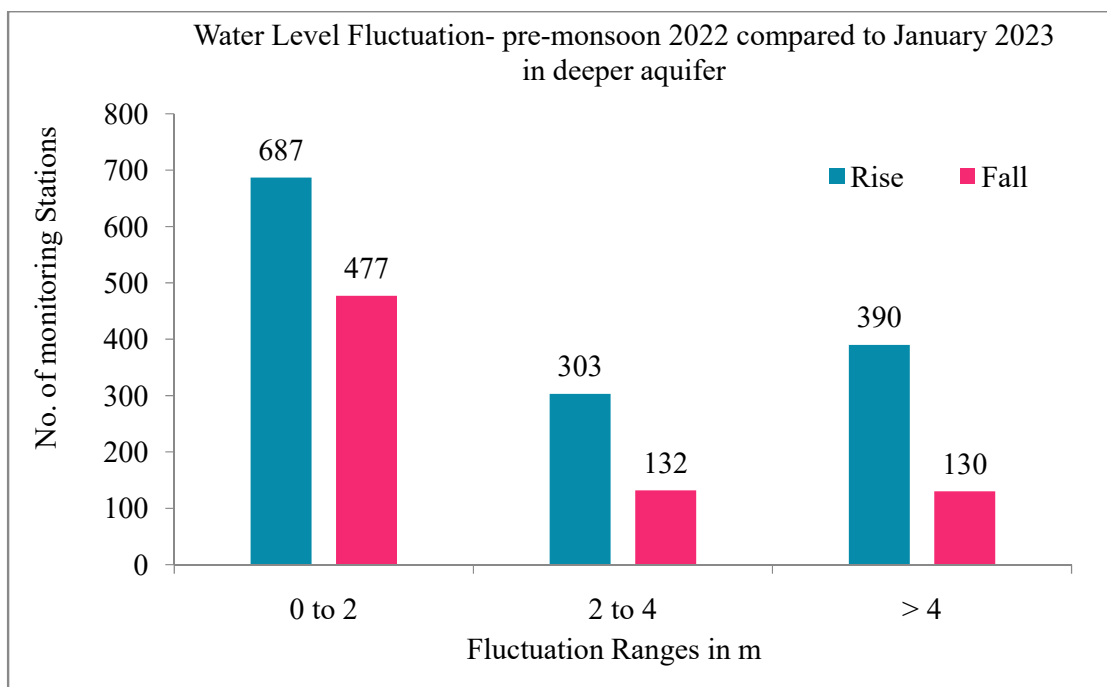
SEASONAL WATER LEVEL FLUCTUATION (PRE-MONSOON 2022- NOVEMBER 2022)

A comparison of depth to water level of pre-monsoon 2022 with November 2022 indicates that out of analysed 2231 wells (**Annexure-XXV**), about 77.4% (1727) of wells are showing rise in water levels, out of which 31.6% (705) wells are showing rise of less than 2 m range. About 19.3% (430) wells are showing rise in water level in the range of 2 to 4 m and another 26.5% (592) wells are showing rise in water in range of more than 4 m. Similarly, 22.1% (494) wells are showing decline in water level, out of which 15.8% (353) wells are showing decline in water in the range of 0 to 2 m, 3.5% (78) wells are showing fall in water level in the range of 2 to 4 m and the remaining 2.8% (63) wells are showing fall in water level of more than 4 m. Rise in water level is mostly prominent all over the country covering in all the states. Fall of 2 to 4 m or more is observed in Chhattisgarh, Haryana, Karnataka, Punjab, Tamil Nadu and West Bengal. Rise in water levels is observed in Andhra Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal and Puducherry.



SEASONAL WATER LEVEL FLUCTUATION (PRE-MONSOON 2022- JANUARY 2023)

A comparison of depth to water level of pre-monsoon 2022 with January 2023 indicates that out of analysed 2122 wells (**Annexure-XXVI**), about 65.0% (1380) of wells are showing rise in water levels, out of which 32.4% (687) wells are showing rise of less than 2 m range. About 14.3% (303) wells are showing rise in water level in the range of 2 to 4 m and another 18.4% (390) wells are showing rise in water in range of more than 4 m. Similarly, 34.8% (739) wells are showing decline in water level, out of which 22.5% (477) wells are showing decline in water in the range of 0 to 2 m, 6.2% (132) wells are showing fall in water level in the range of 2 to 4 m and the remaining 6.1% (130) wells are showing fall in water level of more than 4 m. Rise in water level is mostly prominent all over the country covering in all the states except West Bengal and Punjab. Fall of 2 to 4 m or more is observed in scattered patches in Chhattisgarh, Gujarat, Tamil Nadu, Odisha and West Bengal. Rise in water levels is observed in all most all states. Rise of more than 4 m is observed in Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Telangana, West Bengal and Puducherry

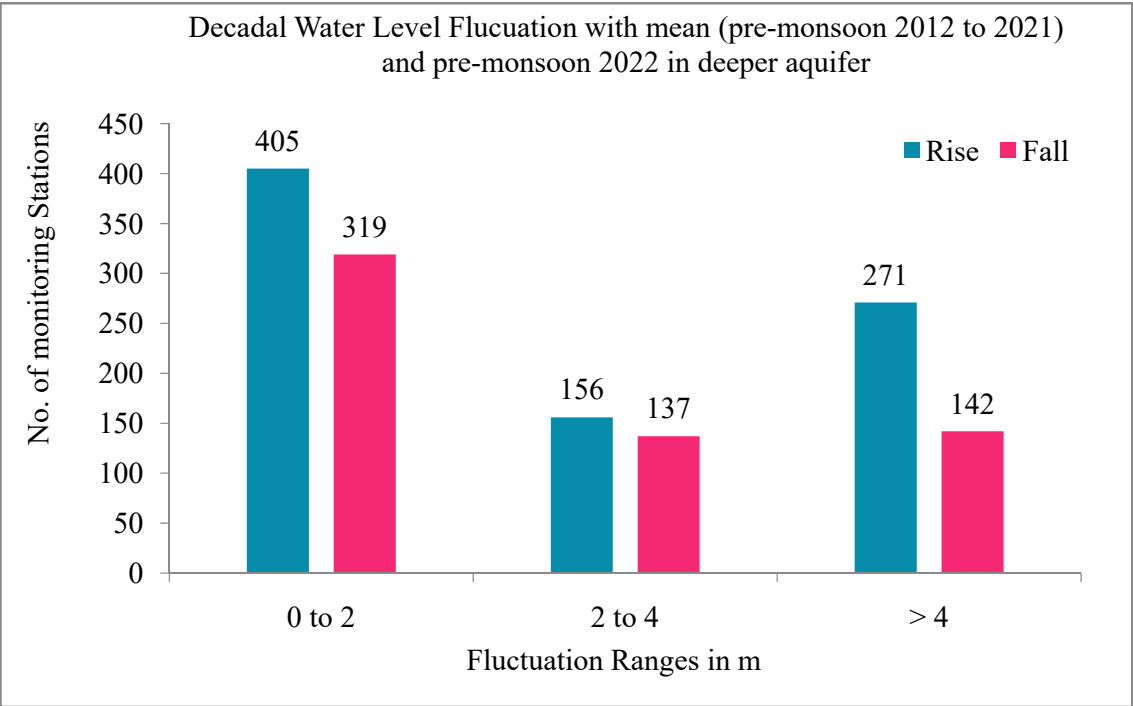


3.3.4 DECADAL WATER LEVEL FLUCTUATION IN DEEPER AQUIFER

WATER LEVEL FLUCTUATION WITH DECADAL MEAN (PRE-MONSOON-2012 TO PRE-MONSOON-2021) TO PRE-MONSOON 2022 IN DEEPER AQUIFER

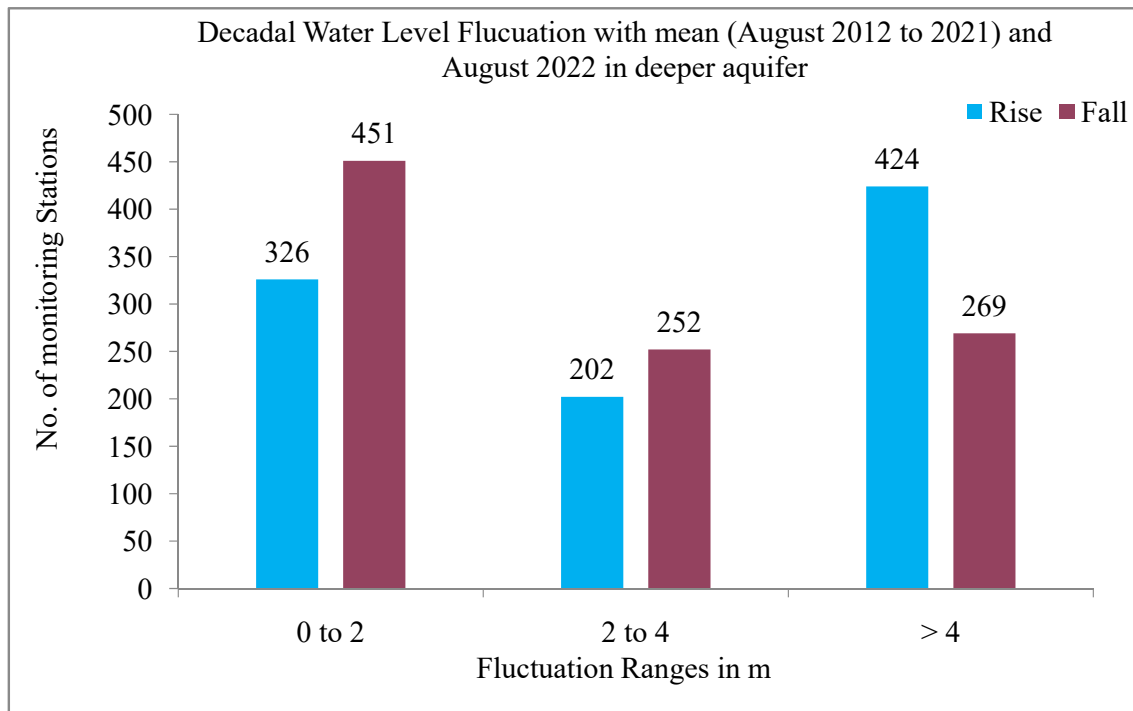
A comparison of depth to water level of pre-monsoon 2022 with decadal mean of pre-monsoon (2012-2021) indicates that, out of total 1430 wells analysed (*Annexure-XXVII*), 832 (58.2%) of wells are showing rise in water level, among which 28.3% (405) wells are showing rise of less than 2 m. About 10.9% (156) wells are showing rise in water level in the range of 2 to 4 m and only 19.0% (271) wells are showing rise in the range of more than 4 m. Among the 598 (41.8%) wells showing decline in water level, 22.3% (319) wells are showing decline in water in the range of 0 to 2 m. 9.6% (137) wells are showing decline in water level in 2 to 4 m range and remaining 9.9% (142) are in the range of more than 4 m. Rise in water level in majority of wells observed in Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Telangana, West Bengal, Andaman and Nicobar and Delhi. Similarly fall in significant number of wells is observed in Chhattisgarh, Goa, Gujarat, Haryana, Kerala, Madhya Pradesh, Odisha, Punjab, Tamil Nadu, West Bengal and Puducherry. Rise of more than 4 m is observed in

Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Telangana and Delhi.



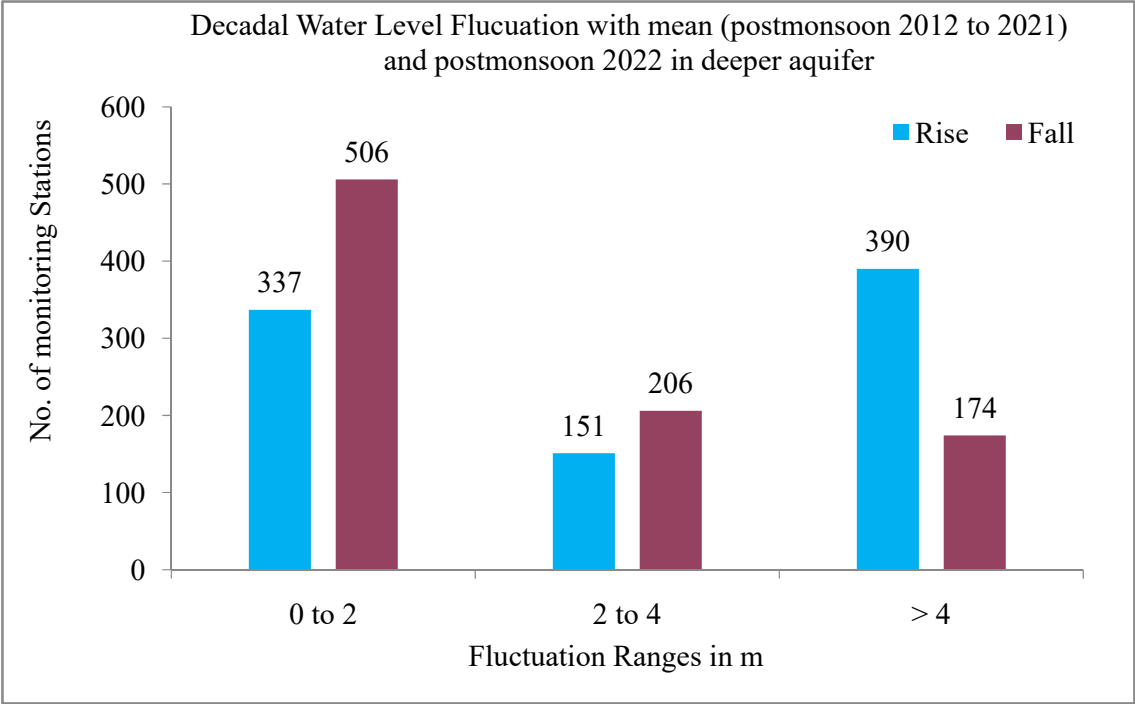
WATER LEVEL FLUCTUATION WITH DECADAL MEAN (AUGUST-2012 TO AUGUST-2021) TO AUGUST 2022 IN DEEPER AQUIFER

A comparison of depth to water level of August2022 with decadal mean of August (2012-2021) indicates that, out of total 1924 wells analysed (**Annexure-XXVIII**),952(49.5%) of wells are showing rise in water level, among which 16.9% (326) wells are showing rise of less than 2 m. About 10.5% (202) wells are showing rise in water level in the range of 2 to 4 m and 22.0% (424) wells are showing rise in the range of more than 4 m. Among the972(50.5%) wells showing decline in water level, 23.4% (451) wells are showing decline in water in the range of 0 to 2 m. 13.1% (252) wells are showing decline in water level in 2 to 4 m range and remaining 14.0% (269) are in the range of more than 4 m. Rise in water level in majority of wells observed in Andhra Pradesh, Assam, Gujarat, Karnataka, Kerala, Madhya Pradesh, Odisha, Tamil Nadu, Delhi and Puducherry. Similarly fall in significant number of wells is observed in Chandigarh, Chhattisgarh, Gujarat, Haryana, Kerala, Odisha, Punjab, Telangana and West Bengal.



WATER LEVEL FLUCTUATION WITH DECADAL MEAN (NOVEMBER 2012 TO NOVEMBER 2021) TO NOVEMBER 2022 IN DEEPER AQUIFER

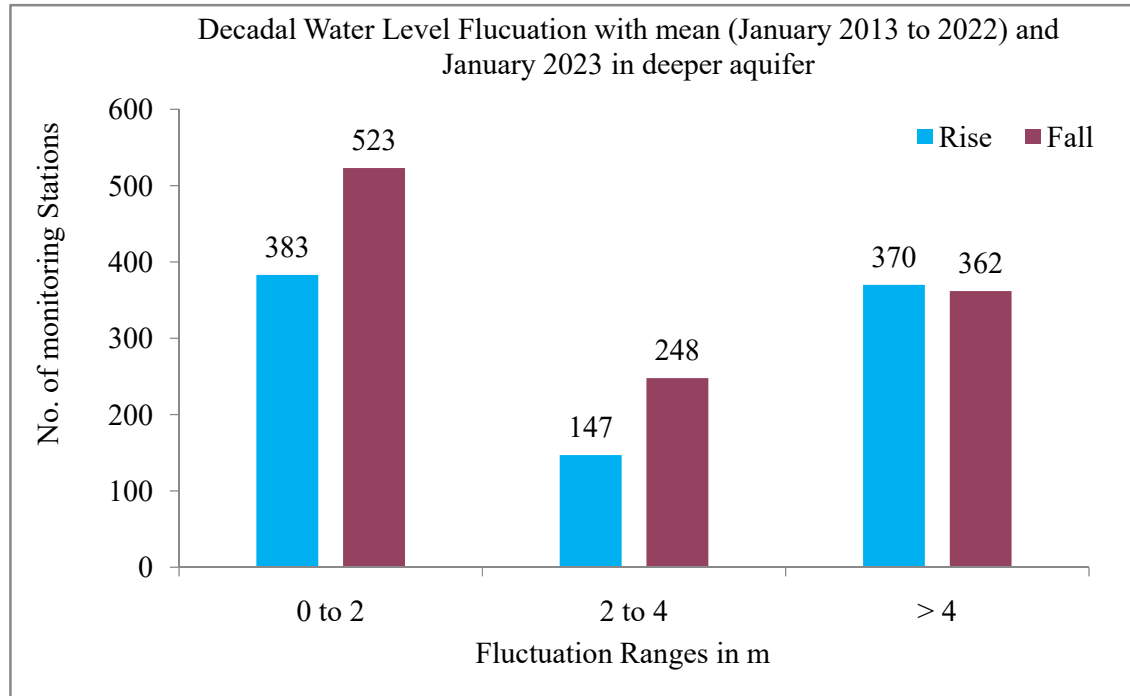
A comparison of depth to water level of November 2022 with decadal mean of November (2012-2021) indicates that, out of total 1764 wells analysed (**Annexure-XXIX**), 878 (49.8%) of wells are showing rise in water level, among which 19.1% (337) wells are showing rise of less than 2 m. About 8.6% (151) wells are showing rise in water level in the range of 2 to 4 m and only 22.1% (390) wells are showing rise in the range of more than 4 m. Among the 886 (52.2%) wells showing decline in water level, 28.7% (506) wells are showing decline in water in the range of 0 to 2 m. 11.7% (206) wells are showing decline in water level in 2 to 4 m range and remaining 9.9% (174) are in the range of more than 4 m. Rise in water level in majority of wells observed in Andhra Pradesh, Assam, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Telangana, Chandigarh, Delhi and Puducherry. Similarly fall in significant number of wells is observed in Chhattisgarh, Goa, Gujarat, Haryana, Kerala, Punjab, Tripura and West Bengal.



WATER LEVEL FLUCTUATION WITH DECADEAL MEAN (JANUARY-2013 TO JANUARY-2022) TO JANUARY-2023 IN DEEPER AQUIFER

A comparison of depth to water level of January 2023 with decadal mean of January (2013-2022) indicates that, out of total 2033 wells analysed(*Annexure-XXX*), 900(44.3%) of wells are showing rise in water level, out of which 18.8% (383) wells are showing rise of less than 2 m. About 7.2% (147) wells are showing rise in water level in the range of 2 to 4 m and 18.2% (370) wells are showing rise in the range of more than 4 m. Among the1133 (55.7%) wells showing decline in water level, 25.7% (532) wells are showing decline in water in the range of 0 to 2 m. 12.2% (248) wells are showing decline in water level in 2 to 4 m range and remaining 17.8% (362) are in the range of more than 4 m. Rise in water level in majority of wells observed in Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu, Telangana, Delhi and Puducherry. Similarly fall in

significant number of wells is observed in Chhattisgarh, Goa, Haryana, Kerala, Meghalaya, Odisha, Punjab, Telangana, West Bengal and Chandigarh.



State-wise Depth to Water Level Distribution of Percentage of Observation Wells Pre-Monsoon 2022in Unconfined Aquifer

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	714	0.01	43.28	142	19.9	357	50.0	170	23.8	33	4.6	8	1.1	4	0.6
2	Arunachal Pradesh	24	0.15	12.19	5	20.8	8	33.3	9	37.5	2	8.3	0	0.0	0	0.0
3	Assam	279	0.17	22.98	58	20.8	161	57.7	48	17.2	10	3.6	2	0.7	0	0.0
4	Bihar	585	0.35	14.08	42	7.2	330	56.4	202	34.5	11	1.9	0	0.0	0	0.0
5	Chhattisgarh	873	0.35	34.00	25	2.9	241	27.6	478	54.8	123	14.1	6	0.7	0	0.0
6	Goa	77	1.50	15.97	1	1.3	35	45.5	31	40.3	10	13.0	0	0.0	0	0.0
7	Gujarat	701	0.42	52.42	23	3.3	155	22.1	241	34.4	212	30.2	65	9.3	5	0.7
8	Haryana	990	0.65	98.00	35	3.5	193	19.5	165	16.7	240	24.2	258	26.1	99	10.0
9	Himachal Pradesh	83	0.82	29.79	6	7.2	30	36.1	22	26.5	19	22.9	6	7.2	0	0.0
10	Jharkhand	318	0.45	14.55	13	4.1	81	25.5	193	60.7	31	9.7	0	0.0	0	0.0
11	Karnataka	1383	0.04	32.26	307	22.2	470	34.0	437	31.6	166	12.0	3	0.2	0	0.0
12	Kerala	1389	0.16	51.70	150	10.8	421	30.3	582	41.9	223	16.1	11	0.8	2	0.1
13	Madhya Pradesh	1203	0.45	44.62	15	1.2	182	15.1	607	50.5	366	30.4	30	2.5	3	0.2
14	Maharashtra	1679	0.10	36.50	66	3.9	378	22.5	836	49.8	365	21.7	34	2.0	0	0.0
15	Meghalaya	48	0.58	9.37	8	16.7	30	62.5	10	20.8	0	0.0	0	0.0	0	0.0
16	Nagaland	11	1.45	18.04	1	9.1	1	9.1	6	54.5	3	27.3	0	0.0	0	0.0
17	Odisha	1314	0.15	15.70	143	10.9	671	51.1	472	35.9	28	2.1	0	0.0	0	0.0
18	Punjab	752	1.20	68.20	12	1.6	91	12.1	124	16.5	194	25.8	303	40.3	28	3.7
19	Rajasthan	945	0.25	145.50	17	1.8	97	10.3	214	22.6	254	26.9	182	19.3	181	19.2
20	Tamil Nadu	875	0.14	48.80	160	18.3	418	47.8	232	26.5	59	6.7	4	0.5	2	0.2
21	Telangana	526	0.02	69.70	30	5.7	175	33.3	210	39.9	94	17.9	14	2.7	3	0.6
22	Tripura	94	0.75	28.35	14	14.9	52	55.3	23	24.5	3	3.2	2	2.1	0	0.0
23	Uttar Pradesh	812	0.42	44.46	16	2.0	336	41.4	290	35.7	139	17.1	29	3.6	2	0.2
24	Uttarakhand	165	0.53	76.17	3	1.8	36	21.8	39	23.6	52	31.5	20	12.1	15	9.1
25	West Bengal	711	0.35	20.18	115	16.2	360	50.6	216	30.4	19	2.7	1	0.1	0	0.0
26	Andaman and Nicobar	110	0.01	5.90	86	78.2	21	19.1	3	2.7	0	0.0	0	0.0	0	0.0
27	Chandigarh	8	3.02	21.53	0	0.0	4	50.0	2	25.0	1	12.5	1	12.5	0	0.0
28	Daman & Diu and Dadra & Nagar Haveli	9	3.15	9.15	0	0.0	3	33.3	6	66.7	0	0.0	0	0.0	0	0.0
29	Delhi	117	1.25	53.34	5	4.3	35	29.9	35	29.9	27	23.1	12	10.3	3	2.6
30	Jammu and Kashmir	260	0.10	36.58	33	12.7	139	53.5	62	23.8	18	6.9	8	3.1	0	0.0
31	Puducherry	9	1.84	3.29	1	11.1	8	88.9	0	0.0	0	0.0	0	0.0	0	0.0
	Total	17064	0.01	145.50	1532	9.0	5519	32.3	5965	35.0	2702	15.8	999	5.9	347	2.0

State-wise Depth to Water Level Distribution of Percentage of Observation Wells August 2022in Unconfined Aquifer

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	747	0.01	99.50	298	39.9	273	36.5	125	16.7	39	5.2	10	1.3	2	0.3
2	Arunachal Pradesh	25	0.10	13.04	11	44.0	10	40.0	3	12.0	1	4.0	0	0.0	0	0.0
3	Assam	295	0.10	23.47	161	54.6	110	37.3	19	6.4	4	1.4	1	0.3	0	0.0
4	Bihar	628	0.06	12.56	145	23.1	391	62.3	87	13.9	5	0.8	0	0.0	0	0.0
5	Chhattisgarh	965	0.01	31.00	492	51.0	363	37.6	95	9.8	12	1.2	3	0.3	0	0.0
6	Goa	80	0.56	16.75	22	27.5	39	48.8	16	20.0	3	3.8	0	0.0	0	0.0
7	Gujarat	680	0.01	60.70	241	35.4	241	35.4	111	16.3	65	9.6	19	2.8	3	0.4
8	Haryana	266	0.04	88.92	45	16.9	43	16.2	48	18.0	67	25.2	49	18.4	14	5.3
9	Himachal Pradesh	88	0.08	36.92	27	30.7	27	30.7	17	19.3	11	12.5	6	6.8	0	0.0
10	Jharkhand	364	0.09	12.10	105	28.8	165	45.3	88	24.2	6	1.6	0	0.0	0	0.0
11	Karnataka	1346	0.01	26.00	655	48.7	462	34.3	203	15.1	23	1.7	3	0.2	0	0.0
12	Kerala	1411	0.01	52.20	400	28.3	486	34.4	436	30.9	79	5.6	8	0.6	2	0.1
13	Madhya Pradesh	1288	0.01	38.92	591	45.9	443	34.4	173	13.4	65	5.0	16	1.2	0	0.0
14	Maharashtra	1691	0.01	55.27	755	44.6	651	38.5	194	11.5	72	4.3	15	0.9	4	0.2
15	Meghalaya	50	0.05	6.64	27	54.0	22	44.0	1	2.0	0	0.0	0	0.0	0	0.0
16	Nagaland	10	0.41	9.95	2	20.0	4	40.0	4	40.0	0	0.0	0	0.0	0	0.0
17	Odisha	1390	0.02	8.75	944	67.9	401	28.8	45	3.2	0	0.0	0	0.0	0	0.0
18	Punjab	618	0.13	51.20	30	4.9	58	9.4	83	13.4	140	22.7	268	43.4	39	6.3
19	Rajasthan	978	0.02	130.60	148	15.1	178	18.2	153	15.6	169	17.3	154	15.7	176	18.0
20	Tamil Nadu	891	0.36	48.00	66	7.4	429	48.1	323	36.3	67	7.5	4	0.4	2	0.2
21	Telangana	587	0.02	49.55	255	43.4	199	33.9	99	16.9	27	4.6	6	1.0	1	0.2
22	Tripura	89	0.08	27.77	29	32.6	45	50.6	10	11.2	3	3.4	2	2.2	0	0.0
23	Uttar Pradesh	801	0.05	44.11	166	20.7	318	39.7	192	24.0	100	12.5	23	2.9	2	0.2
24	Uttarakhand	160	0.24	93.90	13	8.1	36	22.5	47	29.4	34	21.3	21	13.1	9	5.6
25	West Bengal	735	0.03	19.77	376	51.2	268	36.5	79	10.7	12	1.6	0	0.0	0	0.0
26	Chandigarh	11	2.55	33.08	0	0.0	3	27.3	3	27.3	2	18.2	3	27.3	0	0.0
27	Daman & Diu and Dadra & Nagar Haveli	5	1.00	5.83	2	40.0	1	20.0	2	40.0	0	0.0	0	0.0	0	0.0
28	Delhi	117	0.43	52.68	11	9.4	28	23.9	37	31.6	24	20.5	14	12.0	3	2.6
29	Jammu and Kashmir	277	0.31	34.06	113	40.8	118	42.6	26	9.4	12	4.3	8	2.9	0	0.0
30	Puducherry	9	2.31	6.55	0	0.0	7	77.8	2	22.2	0	0.0	0	0.0	0	0.0
	Total	16602	0.01	130.60	6130	36.9	5819	35.0	2721	16.4	1042	6.3	633	3.8	257	1.5

State-wise Depth to Water Level Distribution of Percentage of Observation Wells Post-Monsoon 2022in Unconfined Aquifer

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	740	0.01	37.62	370	50.0	233	31.5	100	13.5	30	4.1	7	0.9	0	0.0
2	Arunachal Pradesh	25	0.10	10.93	9	36.0	8	32.0	7	28.0	1	4.0	0	0.0	0	0.0
3	Assam	299	0.01	19.03	146	48.8	125	41.8	21	7.0	7	2.3	0	0.0	0	0.0
4	Bihar	664	0.33	11.30	104	15.7	458	69.0	99	14.9	3	0.5	0	0.0	0	0.0
5	Chhattisgarh	1024	0.20	40.00	234	22.9	619	60.4	157	15.3	13	1.3	1	0.1	0	0.0
6	Goa	83	0.15	17.24	7	8.4	37	44.6	30	36.1	9	10.8	0	0.0	0	0.0
7	Gujarat	711	0.10	61.42	121	17.0	274	38.5	201	28.3	81	11.4	30	4.2	4	0.6
8	Haryana	945	0.04	97.00	85	9.0	177	18.7	133	14.1	204	21.6	240	25.4	106	11.2
9	Himachal Pradesh	84	0.54	36.25	16	19.0	29	34.5	15	17.9	19	22.6	5	6.0	0	0.0
10	Jharkhand	392	0.40	16.10	47	12.0	244	62.2	96	24.5	5	1.3	0	0.0	0	0.0
11	Karnataka	1402	0.01	27.30	461	32.9	540	38.5	350	25.0	49	3.5	2	0.1	0	0.0
12	Kerala	1424	0.05	52.82	280	19.7	456	32.0	544	38.2	130	9.1	13	0.9	1	0.1
13	Madhya Pradesh	1225	0.02	37.67	228	18.6	585	47.8	323	26.4	79	6.4	10	0.8	0	0.0
14	Maharashtra	1724	0.10	55.00	394	22.9	850	49.3	402	23.3	63	3.7	13	0.8	2	0.1
15	Meghalaya	50	0.07	6.73	26	52.0	23	46.0	1	2.0	0	0.0	0	0.0	0	0.0
16	Nagaland	13	0.45	10.04	3	23.1	3	23.1	6	46.2	1	7.7	0	0.0	0	0.0
17	Odisha	1415	0.03	11.60	570	40.3	709	50.1	133	9.4	3	0.2	0	0.0	0	0.0
18	Punjab	502	0.79	48.79	19	3.8	75	14.9	79	15.7	143	28.5	168	33.5	18	3.6
19	Rajasthan	964	0.06	124.50	73	7.6	235	24.4	164	17.0	174	18.0	145	15.0	173	17.9
20	Tamil Nadu	896	0.52	47.52	190	21.2	463	51.7	197	22.0	44	4.9	1	0.1	1	0.1
21	Telangana	551	0.01	62.20	192	34.8	228	41.4	101	18.3	25	4.5	2	0.4	3	0.5
22	Tripura	98	0.54	26.38	26	26.5	56	57.1	11	11.2	4	4.1	1	1.0	0	0.0
23	Uttar Pradesh	904	0.15	44.14	218	24.1	367	40.6	196	21.7	101	11.2	18	2.0	4	0.4
24	Uttarakhand	152	0.20	68.10	17	11.2	44	28.9	36	23.7	27	17.8	18	11.8	10	6.6
25	West Bengal	733	0.05	16.55	193	26.3	402	54.8	124	16.9	14	1.9	0	0.0	0	0.0
26	Andaman and Nicobar	109	0.04	4.90	94	86.2	15	13.8	0	0.0	0	0.0	0	0.0	0	0.0
27	Chandigarh	13	2.51	49.01	0	0.0	4	30.8	2	15.4	3	23.1	3	23.1	1	7.7
28	Daman & Diu and Dadra & Nagar Haveli	22	1.45	7.80	2	9.1	16	72.7	4	18.2	0	0.0	0	0.0	0	0.0
29	Delhi	116	0.62	51.69	9	7.8	28	24.1	43	37.1	22	19.0	11	9.5	3	2.6
30	Jammu and Kashmir	310	0.20	88.88	86	27.7	146	47.1	45	14.5	20	6.5	11	3.5	2	0.6
31	Puducherry	9	1.16	6.04	1	11.1	7	77.8	1	11.1	0	0.0	0	0.0	0	0.0
	Total	17599	0.01	124.50	4221	24.0	7456	42.4	3621	20.6	1274	7.2	699	4.0	328	1.9

State-wise Depth to Water Level Distribution of Percentage of Observation Wells January 2023

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	782	0.01	69.82	283	36.2	337	43.1	110	14.1	38	4.9	13	1.7	1	0.1
2	Arunachal Pradesh	26	0.05	11.47	6	23.1	8	30.8	9	34.6	3	11.5	0	0.0	0	0.0
3	Assam	299	0.15	20.34	69	23.1	176	58.9	45	15.1	8	2.7	1	0.3	0	0.0
4	Bihar	789	0.42	15.70	49	6.2	515	65.3	214	27.1	11	1.4	0	0.0	0	0.0
5	Chhattisgarh	1018	0.30	50.00	74	7.3	513	50.4	380	37.3	47	4.6	3	0.3	1	0.1
6	Goa	83	1.60	16.31	3	3.6	37	44.6	29	34.9	14	16.9	0	0.0	0	0.0
7	Gujarat	721	0.33	61.81	77	10.7	235	32.6	243	33.7	128	17.8	35	4.9	3	0.4
8	Haryana	268	0.09	88.92	37	13.8	52	19.4	50	18.7	71	26.5	42	15.7	16	6.0
9	Himachal Pradesh	81	0.29	38.21	10	12.3	30	37.0	20	24.7	16	19.8	5	6.2	0	0.0
10	Jharkhand	399	0.26	15.60	24	6.0	153	38.3	212	53.1	10	2.5	0	0.0	0	0.0
11	Karnataka	1365	0.01	23.50	95	7.0	539	39.5	547	40.1	182	13.3	2	0.1	0	0.0
12	Kerala	1399	0.01	53.00	168	12.0	427	30.5	600	42.9	189	13.5	12	0.9	3	0.2
13	Madhya Pradesh	1183	0.20	39.32	70	5.9	375	31.7	518	43.8	206	17.4	14	1.2	0	0.0
14	Maharashtra	1659	0.10	56.90	161	9.7	719	43.3	610	36.8	154	9.3	13	0.8	2	0.1
15	Meghalaya	49	0.20	8.27	10	20.4	29	59.2	10	20.4	0	0.0	0	0.0	0	0.0
16	Nagaland	13	1.87	12.04	1	7.7	4	30.8	6	46.2	2	15.4	0	0.0	0	0.0
17	Odisha	1408	0.05	16.50	278	19.7	778	55.3	337	23.9	15	1.1	0	0.0	0	0.0
18	Punjab	219	0.57	47.15	13	5.9	42	19.2	38	17.4	71	32.4	48	21.9	7	3.2
19	Rajasthan	958	0.15	146.11	52	5.4	175	18.3	209	21.8	194	20.3	152	15.9	176	18.4
20	Tamil Nadu	897	0.33	46.90	112	12.5	503	56.1	218	24.3	60	6.7	3	0.3	1	0.1
21	Telangana	591	0.16	59.90	121	20.5	247	41.8	172	29.1	42	7.1	7	1.2	2	0.3
22	Tripura	97	0.89	26.70	18	18.6	57	58.8	16	16.5	5	5.2	1	1.0	0	0.0
23	Uttar Pradesh	999	0.35	44.36	105	10.5	474	47.4	259	25.9	130	13.0	28	2.8	3	0.3
24	Uttarakhand	164	0.08	70.78	14	8.5	46	28.0	34	20.7	35	21.3	21	12.8	14	8.5
25	West Bengal	738	0.05	22.21	124	16.8	410	55.6	179	24.3	24	3.3	1	0.1	0	0.0
26	Chandigarh	12	2.74	48.08	0	0.0	4	33.3	2	16.7	2	16.7	3	25.0	1	8.3
27	Daman & Diu and Dadra & Nagar Haveli	5	5.49	7.34	0	0.0	0	0.0	5	100.0	0	0.0	0	0.0	0	0.0
28	Delhi	115	0.96	55.49	7	6.1	30	26.1	43	37.4	21	18.3	12	10.4	2	1.7
29	Jammu and Kashmir	253	0.12	89.00	42	16.6	123	48.6	52	20.6	21	8.3	14	5.5	1	0.4
30	Puducherry	9	1.60	6.30	1	11.1	7	77.8	1	11.1	0	0.0	0	0.0	0	0.0
	Total	16599	0.01	146.11	2024	12.2	7045	42.4	5168	31.1	1699	10.2	430	2.6	233	1.4

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2021 to Pre-Monsoon 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	1	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	0
2	Arunachal Pradesh	22	10	45.5	1	4.5	0	0.0	9	40.9	1	4.5	0	0.0	11	10
3	Assam	208	103	49.5	4	1.9	2	1.0	92	44.2	4	1.9	1	0.5	109	97
4	Bihar	181	32	17.7	6	3.3	1	0.6	94	51.9	42	23.2	6	3.3	39	142
5	Chhattisgarh	636	83	13.1	13	2.0	6	0.9	326	51.3	103	16.2	90	14.2	102	519
6	Gujarat	602	148	24.6	34	5.6	24	4.0	243	40.4	77	12.8	58	9.6	206	378
7	Haryana	859	359	41.8	64	7.5	12	1.4	369	43.0	28	3.3	17	2.0	435	414
8	Himachal Pradesh	80	31	38.8	5	6.3	4	5.0	36	45.0	2	2.5	2	2.5	40	40
9	Jharkhand	115	7	6.1	8	7.0	8	7.0	33	28.7	27	23.5	32	27.8	23	92
10	Kerala	1126	645	57.3	48	4.3	14	1.2	373	33.1	25	2.2	11	1.0	707	409
11	Madhya Pradesh	1072	347	32.4	74	6.9	58	5.4	380	35.4	121	11.3	72	6.7	479	573
12	Maharashtra	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
13	Meghalaya	45	15	33.3	0	0.0	0	0.0	25	55.6	4	8.9	0	0.0	15	29
14	Odisha	1138	648	56.9	87	7.6	19	1.7	336	29.5	32	2.8	3	0.3	754	371
15	Punjab	691	180	26.0	7	1.0	7	1.0	450	65.1	25	3.6	19	2.7	194	494
16	Rajasthan	884	254	28.7	94	10.6	70	7.9	283	32.0	77	8.7	84	9.5	418	444
17	Tamil Nadu	363	170	46.8	66	18.2	40	11.0	70	19.3	10	2.8	5	1.4	276	85
18	Telangana	112	36	32.1	8	7.1	8	7.1	46	41.1	8	7.1	6	5.4	52	60
19	Tripura	91	39	42.9	0	0.0	0	0.0	49	53.8	2	2.2	0	0.0	39	51
20	Uttar Pradesh	591	234	39.6	32	5.4	13	2.2	226	38.2	65	11.0	19	3.2	279	310
21	Uttarakhand	151	55	36.4	14	9.3	11	7.3	50	33.1	11	7.3	10	6.6	80	71
22	West Bengal	378	190	50.3	49	13.0	17	4.5	111	29.4	7	1.9	4	1.1	256	122
23	Chandigarh	8	5	62.5	0	0.0	0	0.0	3	37.5	0	0.0	0	0.0	5	3
24	Daman & Diu and Dadra & Nagar Haveli	5	2	40.0	0	0.0	0	0.0	2	40.0	1	20.0	0	0.0	2	3
25	Delhi	96	47	49.0	28	29.2	5	5.2	14	14.6	0	0.0	2	2.1	80	16
26	Jammu and Kashmir	212	101	47.6	9	4.2	2	0.9	87	41.0	8	3.8	3	1.4	112	98
27	Puducherry	5	3	60.0	0	0.0	1	20.0	1	20.0	0	0.0	0	0.0	4	1
	Total	9673	3745	38.7	651	6.7	323	3.3	3708	38.3	680	7.0	444	4.6	4719	4832

N.B. 122 monitoring wells (1.2%) show no change in Water Level. Reduction in no. of wells analysed is due to less no of stations monitored during Pre-monsoon 2021 because of Covid-19 pandemic.

Annexure-VI

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from with August 2021 to August 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	681	296	43.5	47	6.9	22	3.2	259	38.0	34	5.0	19	2.8	365	312
2	Arunachal Pradesh	19	5	26.3	0	0.0	0	0.0	12	63.2	1	5.3	0	0.0	5	13
3	Assam	250	101	40.4	3	1.2	2	0.8	130	52.0	10	4.0	1	0.4	106	141
4	Bihar	492	87	17.7	8	1.6	2	0.4	217	44.1	134	27.2	41	8.3	97	392
5	Chhattisgarh	702	299	42.6	100	14.2	67	9.5	182	25.9	36	5.1	13	1.9	466	231
6	Goa	80	50	62.5	5	6.3	1	1.3	23	28.8	0	0.0	1	1.3	56	24
7	Gujarat	592	218	36.8	106	17.9	112	18.9	119	20.1	19	3.2	14	2.4	436	152
8	Haryana	190	83	43.7	50	26.3	23	12.1	21	11.1	7	3.7	6	3.2	156	34
9	Himachal Pradesh	80	34	42.5	1	1.3	2	2.5	40	50.0	0	0.0	3	3.8	37	43
10	Jharkhand	315	90	28.6	22	7.0	6	1.9	118	37.5	52	16.5	26	8.3	118	196
11	Karnataka	1219	598	49.1	154	12.6	122	10.0	283	23.2	38	3.1	12	1.0	874	333
12	Kerala	1268	481	37.9	82	6.5	19	1.5	601	47.4	49	3.9	19	1.5	582	669
13	Madhya Pradesh	1215	534	44.0	187	15.4	103	8.5	294	24.2	52	4.3	34	2.8	824	380
14	Maharashtra	1551	600	38.7	167	10.8	94	6.1	542	34.9	77	5.0	30	1.9	861	649
15	Meghalaya	34	10	29.4	0	0.0	0	0.0	22	64.7	0	0.0	0	0.0	10	22
16	Nagaland	10	3	30.0	2	20.0	2	20.0	1	10.0	2	20.0	0	0.0	7	3
17	Odisha	1300	832	64.0	147	11.3	43	3.3	257	19.8	6	0.5	1	0.1	1022	264
18	Punjab	172	107	62.2	19	11.0	8	4.7	34	19.8	3	1.7	1	0.6	134	38
19	Rajasthan	893	304	34.0	118	13.2	139	15.6	222	24.9	43	4.8	51	5.7	561	316
20	Tamil Nadu	828	249	30.1	101	12.2	102	12.3	309	37.3	45	5.4	15	1.8	452	369
21	Telangana	571	212	37.1	69	12.1	47	8.2	135	23.6	54	9.5	36	6.3	328	225
22	Tripura	84	32	38.1	5	6.0	1	1.2	38	45.2	7	8.3	1	1.2	38	46
23	Uttar Pradesh	630	142	22.5	28	4.4	7	1.1	293	46.5	117	18.6	41	6.5	177	451
24	Uttarakhand	151	23	15.2	6	4.0	9	6.0	84	55.6	19	12.6	10	6.6	38	113
25	West Bengal	643	203	31.6	8	1.2	4	0.6	309	48.1	75	11.7	44	6.8	215	428
26	Chandigarh	9	5	55.6	1	11.1	0	0.0	3	33.3	0	0.0	0	0.0	6	3
27	Daman & Diu and Dadra & Nagar Haveli	2	1	50.0	0	0.0	0	0.0	1	50.0	0	0.0	0	0.0	1	1
28	Delhi	92	42	45.7	12	13.0	0	0.0	29	31.5	6	6.5	3	3.3	54	38
29	Jammu and Kashmir	256	142	55.5	16	6.3	5	2.0	86	33.6	4	1.6	1	0.4	163	91
30	Puducherry	9	3	33.3	0	0.0	0	0.0	6	66.7	0	0.0	0	0.0	3	6
	Total	14338	5786	40.4	1464	10.2	942	6.6	4670	32.6	890	6.2	423	3.0	8192	5983

N.B. 163 monitoring wells (1.2%) show no change in Water Level.

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from with November 2021 to November 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	648	250	38.6	45	6.9	29	4.5	284	43.8	24	3.7	10	1.5	324	318
2	Arunachal Pradesh	19	6	31.6	1	5.3	0	0.0	9	47.4	2	10.5	0	0.0	7	11
3	Assam	258	138	53.5	10	3.9	6	2.3	98	38.0	3	1.2	3	1.2	154	104
4	Bihar	588	131	22.3	8	1.4	2	0.3	323	54.9	95	16.2	26	4.4	141	444
5	Chhattisgarh	768	326	42.4	85	11.1	30	3.9	246	32.0	54	7.0	17	2.2	441	317
6	Goa	81	23	28.4	1	1.2	0	0.0	54	66.7	1	1.2	1	1.2	24	56
7	Gujarat	626	178	28.4	61	9.7	42	6.7	226	36.1	58	9.3	53	8.5	281	337
8	Haryana	814	368	45.2	48	5.9	16	2.0	313	38.5	41	5.0	8	1.0	432	362
9	Himachal Pradesh	75	18	24.0	1	1.3	0	0.0	51	68.0	2	2.7	3	4.0	19	56
10	Jharkhand	292	58	19.9	20	6.8	14	4.8	158	54.1	28	9.6	11	3.8	92	197
11	Karnataka	1183	294	24.9	72	6.1	33	2.8	635	53.7	102	8.6	37	3.1	399	774
12	Kerala	1233	213	17.3	21	1.7	9	0.7	809	65.6	135	10.9	37	3.0	243	981
13	Madhya Pradesh	1149	532	46.3	124	10.8	67	5.8	299	26.0	54	4.7	29	2.5	723	382
14	Maharashtra	1577	454	28.8	115	7.3	51	3.2	735	46.6	135	8.6	57	3.6	620	927
15	Meghalaya	50	29	58.0	2	4.0	0	0.0	15	30.0	3	6.0	0	0.0	31	18
16	Nagaland	11	3	27.3	0	0.0	5	45.5	1	9.1	1	9.1	1	9.1	8	3
17	Odisha	1338	574	42.9	62	4.6	6	0.4	627	46.9	26	1.9	1	0.1	642	654
18	Punjab	414	231	55.8	14	3.4	6	1.4	146	35.3	8	1.9	7	1.7	251	161
19	Rajasthan	906	317	35.0	116	12.8	105	11.6	245	27.0	57	6.3	48	5.3	538	350
20	Tamil Nadu	811	140	17.3	60	7.4	45	5.5	391	48.2	129	15.9	41	5.1	245	561
21	Telangana	466	214	45.9	43	9.2	20	4.3	161	34.5	20	4.3	7	1.5	277	188
22	Tripura	93	51	54.8	4	4.3	1	1.1	31	33.3	5	5.4	0	0.0	56	36
23	Uttar Pradesh	659	180	27.3	26	3.9	8	1.2	368	55.8	57	8.6	16	2.4	214	441
24	Uttarakhand	146	54	37.0	11	7.5	6	4.1	56	38.4	15	10.3	4	2.7	71	75
25	West Bengal	643	91	14.2	5	0.8	5	0.8	388	60.3	113	17.6	41	6.4	101	542
26	Andaman and Nicobar	108	69	63.9	0	0.0	0	0.0	28	25.9	0	0.0	0	0.0	69	28
27	Chandigarh	9	4	44.4	0	0.0	0	0.0	4	44.4	1	11.1	0	0.0	4	5
28	Delhi	103	35	34.0	4	3.9	1	1.0	56	54.4	4	3.9	3	2.9	40	63
29	Jammu and Kashmir	224	95	42.4	4	1.8	4	1.8	109	48.7	5	2.2	4	1.8	103	118
30	Puducherry	9	0	0.0	0	0.0	0	0.0	6	66.7	3	33.3	0	0.0	0	9
	Total	15301	5076	33.2	963	6.3	511	3.3	6872	44.9	1181	7.7	465	3.0	6550	8518

N. B. 233 monitoring wells (1.5%) show no change in Water Level.

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from with January 2022 to January 2023 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	695	249	35.8	15	2.2	15	2.2	345	49.6	44	6.3	18	2.6	279	407
2	Arunachal Pradesh	25	11	44.0	0	0.0	0	0.0	14	56.0	0	0.0	0	0.0	11	14
3	Assam	265	143	54.0	1	0.4	0	0.0	112	42.3	3	1.1	4	1.5	144	119
4	Bihar	598	111	18.6	6	1.0	1	0.2	350	58.5	105	17.6	23	3.8	118	478
5	Chhattisgarh	725	225	31.0	51	7.0	22	3.0	339	46.8	59	8.1	26	3.6	298	424
6	Goa	83	32	38.6	2	2.4	3	3.6	40	48.2	1	1.2	2	2.4	37	43
7	Gujarat	632	154	24.4	47	7.4	37	5.9	254	40.2	67	10.6	70	11.1	238	391
8	Haryana	227	95	41.9	12	5.3	4	1.8	102	44.9	9	4.0	4	1.8	111	115
9	Himachal Pradesh	80	14	17.5	4	5.0	1	1.3	54	67.5	2	2.5	4	5.0	19	60
10	Jharkhand	311	55	17.7	6	1.9	2	0.6	173	55.6	58	18.6	16	5.1	63	247
11	Karnataka	1122	113	10.1	33	2.9	26	2.3	700	62.4	177	15.8	69	6.1	172	946
12	Kerala	1203	332	27.6	73	6.1	51	4.2	651	54.1	59	4.9	26	2.2	456	736
13	Madhya Pradesh	1100	332	30.2	68	6.2	35	3.2	430	39.1	125	11.4	80	7.3	435	635
14	Maharashtra	1520	400	26.3	71	4.7	42	2.8	723	47.6	164	10.8	92	6.1	513	979
15	Meghalaya	49	20	40.8	2	4.1	0	0.0	27	55.1	0	0.0	0	0.0	22	27
16	Nagaland	9	2	22.2	0	0.0	1	11.1	1	11.1	3	33.3	2	22.2	3	6
17	Odisha	1327	302	22.8	14	1.1	2	0.2	848	63.9	92	6.9	32	2.4	318	972
18	Punjab	168	42	25.0	6	3.6	0	0.0	107	63.7	9	5.4	4	2.4	48	120
19	Rajasthan	904	251	27.8	99	11.0	77	8.5	321	35.5	83	9.2	62	6.9	427	466
20	Tamil Nadu	821	96	11.7	21	2.6	14	1.7	482	58.7	149	18.1	56	6.8	131	687
21	Telangana	580	222	38.3	41	7.1	17	2.9	207	35.7	35	6.0	48	8.3	280	290
22	Tripura	94	36	38.3	8	8.5	1	1.1	45	47.9	2	2.1	1	1.1	45	48
23	Uttar Pradesh	674	172	25.5	19	2.8	6	0.9	405	60.1	60	8.9	7	1.0	197	472
24	Uttarakhand	158	44	27.8	2	1.3	2	1.3	93	58.9	9	5.7	6	3.8	48	108
25	West Bengal	630	110	17.5	17	2.7	11	1.7	399	63.3	68	10.8	25	4.0	138	492
26	Chandigarh	11	6	54.5	1	9.1	0	0.0	4	36.4	0	0.0	0	0.0	7	4
27	Daman & Diu and Dadra & Nagar Haveli	3	0	0.0	0	0.0	0	0.0	2	66.7	1	33.3	0	0.0	0	3
28	Delhi	78	28	35.9	1	1.3	1	1.3	42	53.8	4	5.1	1	1.3	30	47
29	Jammu and Kashmir	213	48	22.5	1	0.5	2	0.9	138	64.8	21	9.9	3	1.4	51	162
30	Puducherry	9	0	0.0	0	0.0	0	0.0	5	55.6	3	33.3	0	0.0	0	8
	Total	14314	3645	25.5	621	4.3	373	2.6	7413	51.8	1412	9.9	681	4.8	4639	9506

N. B. 169 monitoring wells (1.2%) show no change in Water Level.

State-wise Seasonal Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2022 to August 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	678	365	53.8	112	16.5	38	5.6	134	19.8	16	2.4	9	1.3	515	159
2	Arunachal Pradesh	22	11	50.0	7	31.8	3	13.6	1	4.5	0	0.0	0	0.0	21	1
3	Assam	255	162	63.5	54	21.2	14	5.5	21	8.2	0	0.0	1	0.4	230	22
4	Bihar	531	339	63.8	95	17.9	25	4.7	58	10.9	10	1.9	3	0.6	459	71
5	Chhattisgarh	798	155	19.4	245	30.7	378	47.4	11	1.4	0	0.0	4	0.5	778	15
6	Goa	62	27	43.5	20	32.3	12	19.4	1	1.6	1	1.6	1	1.6	59	3
7	Gujarat	562	131	23.3	117	20.8	284	50.5	19	3.4	4	0.7	4	0.7	532	27
8	Haryana	235	76	32.3	48	20.4	23	9.8	56	23.8	18	7.7	14	6.0	147	88
9	Himachal Pradesh	79	40	50.6	22	27.8	8	10.1	8	10.1	0	0.0	0	0.0	70	8
10	Jharkhand	291	68	23.4	83	28.5	104	35.7	22	7.6	9	3.1	4	1.4	255	35
11	Karnataka	1233	541	43.9	270	21.9	278	22.5	111	9.0	13	1.1	3	0.2	1089	127
12	Kerala	1313	651	49.6	327	24.9	179	13.6	140	10.7	11	0.8	1	0.1	1157	152
13	Madhya Pradesh	1109	131	11.8	231	20.8	702	63.3	27	2.4	6	0.5	11	1.0	1064	44
14	Maharashtra	1602	266	16.6	419	26.2	821	51.2	58	3.6	13	0.8	14	0.9	1506	85
15	Meghalaya	48	31	64.6	16	33.3	1	2.1	0	0.0	0	0.0	0	0.0	48	0
16	Nagaland	9	2	22.2	0	0.0	4	44.4	3	33.3	0	0.0	0	0.0	6	3
17	Odisha	1262	495	39.2	416	33.0	329	26.1	20	1.6	0	0.0	0	0.0	1240	20
18	Punjab	576	117	20.3	25	4.3	8	1.4	297	51.6	96	16.7	33	5.7	150	426
19	Rajasthan	887	359	40.5	164	18.5	244	27.5	93	10.5	15	1.7	7	0.8	767	115
20	Tamil Nadu	838	183	21.8	26	3.1	17	2.0	473	56.4	99	11.8	34	4.1	226	606
21	Telangana	526	142	27.0	165	31.4	191	36.3	24	4.6	1	0.2	2	0.4	498	27
22	Tripura	82	43	52.4	16	19.5	8	9.8	12	14.6	2	2.4	0	0.0	67	14
23	Uttar Pradesh	735	342	46.5	173	23.5	50	6.8	145	19.7	17	2.3	4	0.5	565	166
24	Uttarakhand	154	60	39.0	20	13.0	33	21.4	25	16.2	9	5.8	7	4.5	113	41
25	West Bengal	666	368	55.3	133	20.0	87	13.1	44	6.6	5	0.8	2	0.3	588	51
26	Chandigarh	7	4	57.1	0	0.0	0	0.0	3	42.9	0	0.0	0	0.0	4	3
27	Daman & Diu and Dadra & Nagar Haveli	4	2	50.0	0	0.0	2	50.0	0	0.0	0	0.0	0	0.0	4	0
28	Delhi	116	70	60.3	3	2.6	2	1.7	36	31.0	4	3.4	1	0.9	75	41
29	Jammu and Kashmir	256	109	42.6	74	28.9	33	12.9	36	14.1	3	1.2	0	0.0	216	39
30	Puducherry	9	0	0.0	0	0.0	0	0.0	6	66.7	3	33.3	0	0.0	0	9
	Total	14945	5290	35.4	3281	22.0	3878	25.9	1884	12.6	355	2.4	159	1.1	12449	2398

N. B. 98 monitoring wells (0.66 %) show no change in Water Level.

State-wise Seasonal Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2022 to November 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	651	342	52.5	159	24.4	67	10.3	67	10.3	11	1.7	2	0.3	568	80
2	Arunachal Pradesh	22	13	59.1	1	4.5	2	9.1	6	27.3	0	0.0	0	0.0	16	6
3	Assam	247	182	73.7	33	13.4	10	4.0	18	7.3	3	1.2	1	0.4	225	22
4	Bihar	550	308	56.0	97	17.6	16	2.9	115	20.9	10	1.8	2	0.4	421	127
5	Chhattisgarh	785	226	28.8	239	30.4	272	34.6	39	5.0	2	0.3	5	0.6	737	46
6	Goa	65	43	66.2	8	12.3	3	4.6	8	12.3	2	3.1	1	1.5	54	11
7	Gujarat	612	168	27.5	144	23.5	232	37.9	55	9.0	7	1.1	5	0.8	544	67
8	Haryana	857	454	53.0	68	7.9	35	4.1	261	30.5	27	3.2	9	1.1	557	297
9	Himachal Pradesh	73	48	65.8	10	13.7	6	8.2	7	9.6	2	2.7	0	0.0	64	9
10	Jharkhand	295	91	30.8	108	36.6	64	21.7	23	7.8	5	1.7	2	0.7	263	30
11	Karnataka	1323	621	46.9	239	18.1	133	10.1	281	21.2	27	2.0	11	0.8	993	319
12	Kerala	1321	856	64.8	187	14.2	50	3.8	190	14.4	11	0.8	8	0.6	1093	209
13	Madhya Pradesh	1133	225	19.9	337	29.7	502	44.3	47	4.1	10	0.9	9	0.8	1064	66
14	Maharashtra	1623	423	26.1	457	28.2	596	36.7	96	5.9	20	1.2	20	1.2	1476	136
15	Meghalaya	48	29	60.4	13	27.1	3	6.3	3	6.3	0	0.0	0	0.0	45	3
16	Nagaland	11	2	18.2	0	0.0	6	54.5	3	27.3	0	0.0	0	0.0	8	3
17	Odisha	1260	655	52.0	401	31.8	120	9.5	69	5.5	4	0.3	0	0.0	1176	73
18	Punjab	431	212	49.2	22	5.1	14	3.2	149	34.6	29	6.7	4	0.9	248	182
19	Rajasthan	873	293	33.6	167	19.1	235	26.9	124	14.2	25	2.9	20	2.3	695	169
20	Tamil Nadu	836	335	40.1	109	13.0	51	6.1	282	33.7	38	4.5	17	2.0	495	337
21	Telangana	495	144	29.1	150	30.3	179	36.2	18	3.6	1	0.2	3	0.6	473	22
22	Tripura	90	61	67.8	16	17.8	3	3.3	8	8.9	2	2.2	0	0.0	80	10
23	Uttar Pradesh	714	366	51.3	211	29.6	51	7.1	68	9.5	13	1.8	4	0.6	628	85
24	Uttarakhand	148	56	37.8	43	29.1	33	22.3	10	6.8	5	3.4	1	0.7	132	16
25	West Bengal	649	353	54.4	94	14.5	38	5.9	147	22.7	11	1.7	4	0.6	485	162
26	Andaman and Nicobar	108	75	69.4	3	2.8	0	0.0	27	25.0	0	0.0	0	0.0	78	27
27	Chandigarh	7	6	85.7	1	14.3	0	0.0	0	0.0	0	0.0	0	0.0	7	0
28	Daman & Diu and Dadra & Nagar Haveli	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0
29	Delhi	110	73	66.4	4	3.6	3	2.7	28	25.5	2	1.8	0	0.0	80	30
30	Jammu and Kashmir	257	149	58.0	51	19.8	19	7.4	30	11.7	2	0.8	2	0.8	219	34
31	Puducherry	9	2	22.2	0	0.0	0	0.0	6	66.7	1	11.1	0	0.0	2	7
	Total	15603	6811	43.7	3372	21.6	2743	17.6	2185	14.0	270	1.7	130	0.8	12926	2585

N. B. 92 monitoring wells (0.6 %) show no change in Water Level.

State-wise Seasonal Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2022 to January 2023 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	683	414	60.6	120	17.6	46	6.7	87	12.7	5	0.7	6	0.9	580	98
2	Arunachal Pradesh	24	15	62.5	1	4.2	0	0.0	5	20.8	2	8.3	0	0.0	16	7
3	Assam	259	140	54.1	13	5.0	3	1.2	94	36.3	7	2.7	0	0.0	156	101
4	Bihar	543	283	52.1	48	8.8	11	2.0	164	30.2	29	5.3	4	0.7	342	197
5	Chhattisgarh	791	300	37.9	214	27.1	123	15.5	104	13.1	28	3.5	13	1.6	637	145
6	Goa	65	44	67.7	3	4.6	2	3.1	10	15.4	1	1.5	4	6.2	49	15
7	Gujarat	613	208	33.9	131	21.4	157	25.6	78	12.7	18	2.9	14	2.3	496	110
8	Haryana	240	101	42.1	42	17.5	20	8.3	52	21.7	17	7.1	5	2.1	163	74
9	Himachal Pradesh	73	48	65.8	4	5.5	4	5.5	14	19.2	3	4.1	0	0.0	56	17
10	Jharkhand	293	168	57.3	56	19.1	14	4.8	35	11.9	10	3.4	9	3.1	238	54
11	Karnataka	1298	252	19.4	63	4.9	44	3.4	677	52.2	178	13.7	78	6.0	359	933
12	Kerala	1288	583	45.3	71	5.5	34	2.6	519	40.3	51	4.0	19	1.5	688	589
13	Madhya Pradesh	1082	394	36.4	271	25.0	232	21.4	113	10.4	33	3.0	27	2.5	897	173
14	Maharashtra	1528	580	38.0	379	24.8	279	18.3	196	12.8	50	3.3	32	2.1	1238	278
15	Meghalaya	47	27	57.4	3	6.4	0	0.0	16	34.0	1	2.1	0	0.0	30	17
16	Nagaland	11	1	9.1	0	0.0	6	54.5	3	27.3	1	9.1	0	0.0	7	4
17	Odisha	1235	806	65.3	131	10.6	26	2.1	207	16.8	44	3.6	12	1.0	963	263
18	Punjab	165	92	55.8	11	6.7	5	3.0	50	30.3	5	3.0	2	1.2	108	57
19	Rajasthan	881	262	29.7	157	17.8	193	21.9	194	22.0	42	4.8	23	2.6	612	259
20	Tamil Nadu	828	269	32.5	93	11.2	42	5.1	339	40.9	54	6.5	29	3.5	404	422
21	Telangana	526	208	39.5	133	25.3	121	23.0	53	10.1	4	0.8	6	1.1	462	63
22	Tripura	88	50	56.8	10	11.4	2	2.3	23	26.1	2	2.3	0	0.0	62	25
23	Uttar Pradesh	671	457	68.1	90	13.4	20	3.0	92	13.7	9	1.3	2	0.3	567	103
24	Uttarakhand	158	73	46.2	37	23.4	22	13.9	14	8.9	9	5.7	3	1.9	132	26
25	West Bengal	640	317	49.5	43	6.7	18	2.8	223	34.8	24	3.8	10	1.6	378	257
26	Chandigarh	8	6	75.0	1	12.5	0	0.0	1	12.5	0	0.0	0	0.0	7	1
27	Daman & Diu and Dadra & Nagar Haveli	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
28	Delhi	81	46	56.8	2	2.5	0	0.0	32	39.5	1	1.2	0	0.0	48	33
29	Jammu and Kashmir	204	146	71.6	31	15.2	6	2.9	16	7.8	5	2.5	0	0.0	183	21
30	Puducherry	9	1	11.1	0	0.0	0	0.0	7	77.8	1	11.1	0	0.0	1	8
	Total	14333	6292	43.9	2158	15.1	1430	10.0	3418	23.8	634	4.4	298	2.1	9880	4350

N. B. 103 monitoring wells (0.8%) show no change in Water Level

State-wise Decadal Water Level Fluctuation with Mean [Pre-monsoon (2012 to 2021)] and Pre-monsoon 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	648	332	51.2	109	16.8	80	12.3	109	16.8	11	1.7	6	0.9	521	126
2	Arunachal Pradesh	20	7	35.0	0	0.0	0	0.0	12	60.0	1	5.0	0	0.0	7	13
3	Assam	229	122	53.3	21	9.2	2	0.9	76	33.2	6	2.6	2	0.9	145	84
4	Bihar	514	309	60.1	66	12.8	20	3.9	113	22.0	5	1.0	1	0.2	395	119
5	Chhattisgarh	641	230	35.9	51	8.0	23	3.6	238	37.1	76	11.9	21	3.3	304	335
6	Goa	66	20	30.3	1	1.5	0	0.0	45	68.2	0	0.0	0	0.0	21	45
7	Gujarat	665	259	38.9	77	11.6	83	12.5	157	23.6	50	7.5	34	5.1	419	241
8	Haryana	895	247	27.6	47	5.3	21	2.3	344	38.4	159	17.8	75	8.4	315	578
9	Himachal Pradesh	83	34	41.0	2	2.4	3	3.6	39	47.0	4	4.8	1	1.2	39	44
10	Jharkhand	177	84	47.5	16	9.0	9	5.1	61	34.5	7	4.0	0	0.0	109	68
11	Karnataka	1239	474	38.3	347	28.0	272	22.0	101	8.2	26	2.1	14	1.1	1093	141
12	Kerala	1349	919	68.1	111	8.2	27	2.0	260	19.3	25	1.9	7	0.5	1057	292
13	Madhya Pradesh	1155	493	42.7	124	10.7	68	5.9	355	30.7	80	6.9	34	2.9	685	469
14	Maharashtra	1400	552	39.4	231	16.5	186	13.3	332	23.7	77	5.5	20	1.4	969	429
15	Meghalaya	44	16	36.4	0	0.0	0	0.0	25	56.8	3	6.8	0	0.0	16	28
16	Nagaland	7	1	14.3	1	14.3	0	0.0	4	57.1	1	14.3	0	0.0	2	5
17	Odisha	1105	647	58.6	97	8.8	19	1.7	315	28.5	24	2.2	3	0.3	763	342
18	Punjab	571	70	12.3	5	0.9	7	1.2	214	37.5	140	24.5	134	23.5	82	488
19	Rajasthan	843	257	30.5	60	7.1	64	7.6	227	26.9	103	12.2	132	15.7	381	462
20	Tamil Nadu	643	175	27.2	165	25.7	259	40.3	39	6.1	2	0.3	3	0.5	599	44
21	Telangana	164	62	37.8	45	27.4	33	20.1	18	11.0	3	1.8	3	1.8	140	24
22	Tripura	62	28	45.2	0	0.0	0	0.0	32	51.6	2	3.2	0	0.0	28	34
23	Uttar Pradesh	638	332	52.0	34	5.3	8	1.3	216	33.9	30	4.7	16	2.5	374	262
24	Uttarakhand	149	59	39.6	10	6.7	6	4.0	47	31.5	16	10.7	11	7.4	75	74
25	West Bengal	636	336	52.8	65	10.2	22	3.5	188	29.6	17	2.7	8	1.3	423	213
26	Andaman and Nicobar	109	80	73.4	5	4.6	1	0.9	22	20.2	1	0.9	0	0.0	86	23
27	Chandigarh	8	5	62.5	0	0.0	0	0.0	2	25.0	1	12.5	0	0.0	5	3
28	Daman & Diu and Dadra & Nagar Haveli	9	6	66.7	0	0.0	0	0.0	3	33.3	0	0.0	0	0.0	6	3
29	Delhi	70	23	32.9	15	21.4	12	17.1	11	15.7	5	7.1	4	5.7	50	20
30	Jammu and Kashmir	41	13	31.7	0	0.0	0	0.0	28	68.3	0	0.0	0	0.0	13	28
31	Puducherry	7	5	71.4	2	28.6	0	0.0	0	0.0	0	0.0	0	0.0	7	0
	Total	14187	6197	43.7	1707	12.0	1225	8.6	3633	25.6	875	6.2	529	3.7	9129	5037

State-wise Decadal Water Level Fluctuation with Mean [August (2012 to 2021)] and August 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	637	318	49.9	98	15.4	77	12.1	135	21.2	4	0.6	5	0.8	493	144
2	Arunachal Pradesh	18	6	33.3	0	0.0	0	0.0	11	61.1	1	5.6	0	0.0	6	12
3	Assam	228	102	44.7	2	0.9	2	0.9	114	50.0	5	2.2	3	1.3	106	122
4	Bihar	585	212	36.2	15	2.6	2	0.3	298	50.9	46	7.9	12	2.1	229	356
5	Chhattisgarh	703	350	49.8	68	9.7	6	0.9	234	33.3	34	4.8	11	1.6	424	279
6	Goa	80	22	27.5	2	2.5	0	0.0	50	62.5	5	6.3	1	1.3	24	56
7	Gujarat	642	270	42.1	100	15.6	114	17.8	112	17.4	28	4.4	18	2.8	484	158
8	Haryana	179	84	46.9	29	16.2	7	3.9	45	25.1	11	6.1	3	1.7	120	59
9	Himachal Pradesh	87	24	27.6	2	2.3	0	0.0	55	63.2	4	4.6	2	2.3	26	61
10	Jharkhand	221	80	36.2	14	6.3	0	0.0	90	40.7	29	13.1	8	3.6	94	127
11	Karnataka	1326	529	39.9	319	24.1	286	21.6	168	12.7	20	1.5	4	0.3	1134	192
12	Kerala	1360	673	49.5	113	8.3	20	1.5	511	37.6	33	2.4	8	0.6	806	552
13	Madhya Pradesh	1259	630	50.0	203	16.1	75	6.0	274	21.8	54	4.3	23	1.8	908	351
14	Maharashtra	1511	663	43.9	331	21.9	232	15.4	230	15.2	30	2.0	24	1.6	1226	284
15	Meghalaya	47	29	61.7	1	2.1	0	0.0	17	36.2	0	0.0	0	0.0	30	17
16	Nagaland	10	4	40.0	1	10.0	1	10.0	2	20.0	2	20.0	0	0.0	6	4
17	Odisha	1179	726	61.6	47	4.0	2	0.2	396	33.6	8	0.7	0	0.0	775	404
18	Punjab	186	41	22.0	4	2.2	3	1.6	68	36.6	33	17.7	37	19.9	48	138
19	Rajasthan	881	295	33.5	93	10.6	88	10.0	209	23.7	86	9.8	110	12.5	476	405
20	Tamil Nadu	784	269	34.3	166	21.2	179	22.8	150	19.1	15	1.9	5	0.6	614	170
21	Telangana	573	180	31.4	115	20.1	147	25.7	56	9.8	39	6.8	26	4.5	442	121
22	Tripura	52	20	38.5	2	3.8	1	1.9	20	38.5	8	15.4	1	1.9	23	29
23	Uttar Pradesh	664	198	29.8	36	5.4	10	1.5	333	50.2	61	9.2	25	3.8	244	419
24	Uttarakhand	144	25	17.4	4	2.8	8	5.6	67	46.5	22	15.3	18	12.5	37	107
25	West Bengal	656	300	45.7	13	2.0	2	0.3	263	40.1	53	8.1	25	3.8	315	341
26	Chandigarh	10	2	20.0	1	10.0	0	0.0	3	30.0	4	40.0	0	0.0	3	7
27	Daman & Diu and Dadra & Nagar Haveli	4	3	75.0	0	0.0	0	0.0	1	25.0	0	0.0	0	0.0	3	1
28	Delhi	69	19	27.5	12	17.4	10	14.5	17	24.6	5	7.2	6	8.7	41	28
29	Jammu and Kashmir	155	82	52.9	7	4.5	1	0.6	60	38.7	3	1.9	1	0.6	90	64
30	Puducherry	9	3	33.3	0	0.0	0	0.0	6	66.7	0	0.0	0	0.0	3	6
	Total	14259	6159	43.2	1798	12.6	1273	8.9	3995	28.0	643	4.5	376	2.6	9230	5014

State-wise Decadal Water Level Fluctuation with Mean [Post-monsoon (2012 to 2021)] and post-monsoon 2022 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	621	328	52.8	83	13.4	51	8.2	148	23.8	9	1.4	1	0.2	462	158
2	Arunachal Pradesh	19	6	31.6	0	0.0	0	0.0	11	57.9	2	10.5	0	0.0	6	13
3	Assam	237	135	57.0	4	1.7	1	0.4	92	38.8	2	0.8	3	1.3	140	97
4	Bihar	621	286	46.1	16	2.6	4	0.6	268	43.2	36	5.8	9	1.4	306	313
5	Chhattisgarh	747	434	58.1	73	9.8	19	2.5	192	25.7	20	2.7	8	1.1	526	220
6	Goa	83	8	9.6	0	0.0	0	0.0	66	79.5	7	8.4	2	2.4	8	75
7	Gujarat	683	280	41.0	104	15.2	63	9.2	170	24.9	36	5.3	30	4.4	447	236
8	Haryana	787	234	29.7	78	9.9	30	3.8	273	34.7	103	13.1	69	8.8	342	445
9	Himachal Pradesh	83	23	27.7	4	4.8	0	0.0	52	62.7	3	3.6	1	1.2	27	56
10	Jharkhand	227	99	43.6	13	5.7	3	1.3	94	41.4	15	6.6	3	1.3	115	112
11	Karnataka	1262	510	40.4	177	14.0	140	11.1	394	31.2	28	2.2	12	1.0	827	434
12	Kerala	1378	596	43.3	33	2.4	8	0.6	698	50.7	32	2.3	10	0.7	637	740
13	Madhya Pradesh	1170	604	51.6	232	19.8	84	7.2	194	16.6	40	3.4	15	1.3	920	249
14	Maharashtra	1576	697	44.2	259	16.4	127	8.1	407	25.8	61	3.9	22	1.4	1083	490
15	Meghalaya	47	27	57.4	2	4.3	0	0.0	16	34.0	2	4.3	0	0.0	29	18
16	Nagaland	12	5	41.7	2	16.7	1	8.3	3	25.0	1	8.3	0	0.0	8	4
17	Odisha	1189	667	56.1	29	2.4	3	0.3	465	39.1	24	2.0	1	0.1	699	490
18	Punjab	441	111	25.2	10	2.3	8	1.8	172	39.0	82	18.6	57	12.9	129	311
19	Rajasthan	871	260	29.9	105	12.1	88	10.1	233	26.8	89	10.2	96	11.0	453	418
20	Tamil Nadu	808	268	33.2	170	21.0	185	22.9	165	20.4	17	2.1	3	0.4	623	185
21	Telangana	161	89	55.3	37	23.0	20	12.4	14	8.7	1	0.6	0	0.0	146	15
22	Tripura	70	22	31.4	2	2.9	1	1.4	40	57.1	5	7.1	0	0.0	25	45
23	Uttar Pradesh	689	373	54.1	54	7.8	14	2.0	204	29.6	30	4.4	14	2.0	441	248
24	Uttarakhand	142	68	47.9	13	9.2	5	3.5	38	26.8	12	8.5	6	4.2	86	56
25	West Bengal	640	241	37.7	14	2.2	1	0.2	324	50.6	49	7.7	11	1.7	256	384
26	Andaman and Nicobar	108	75	69.4	0	0.0	0	0.0	33	30.6	0	0.0	0	0.0	75	33
27	Chandigarh	11	5	45.5	0	0.0	0	0.0	3	27.3	1	9.1	2	18.2	5	6
28	Daman & Diu and Dadra & Nagar Haveli	21	12	57.1	0	0.0	0	0.0	9	42.9	0	0.0	0	0.0	12	9
29	Delhi	67	26	38.8	12	17.9	9	13.4	15	22.4	2	3.0	3	4.5	47	20
30	Jammu and Kashmir	207	90	43.5	3	1.4	2	1.0	107	51.7	5	2.4	0	0.0	95	112
31	Puducherry	8	3	37.5	1	12.5	0	0.0	4	50.0	0	0.0	0	0.0	4	4
	Total	14986	6582	43.9	1530	10.2	867	5.8	4904	32.7	714	4.8	378	2.5	8979	5996

State-wise Decadal Water Level Fluctuation with Mean [January (2013 to 2022)] and January 2023 in Unconfined Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	655	361	55.1	81	12.4	51	7.8	145	22.1	12	1.8	5	0.8	493	162
2	Arunachal Pradesh	20	9	45.0	0	0.0	0	0.0	9	45.0	2	10.0	0	0.0	9	11
3	Assam	250	117	46.8	6	2.4	0	0.0	121	48.4	5	2.0	0	0.0	123	126
4	Bihar	628	248	39.5	23	3.7	1	0.2	323	51.4	27	4.3	5	0.8	272	355
5	Chhattisgarh	772	387	50.1	98	12.7	18	2.3	221	28.6	36	4.7	12	1.6	503	269
6	Goa	83	9	10.8	1	1.2	2	2.4	64	77.1	5	6.0	2	2.4	12	71
7	Gujarat	710	287	40.4	100	14.1	89	12.5	167	23.5	46	6.5	21	3.0	476	234
8	Haryana	233	109	46.8	27	11.6	4	1.7	62	26.6	24	10.3	7	3.0	140	93
9	Himachal Pradesh	81	20	24.7	1	1.2	2	2.5	53	65.4	2	2.5	3	3.7	23	58
10	Jharkhand	231	78	33.8	8	3.5	1	0.4	122	52.8	19	8.2	3	1.3	87	144
11	Karnataka	1230	340	27.6	111	9.0	56	4.6	586	47.6	105	8.5	30	2.4	507	721
12	Kerala	1357	607	44.7	43	3.2	25	1.8	622	45.8	44	3.2	16	1.2	675	682
13	Madhya Pradesh	1116	524	47.0	146	13.1	59	5.3	285	25.5	66	5.9	36	3.2	729	387
14	Maharashtra	1506	698	46.3	213	14.1	108	7.2	400	26.6	60	4.0	27	1.8	1019	487
15	Meghalaya	47	16	34.0	0	0.0	0	0.0	28	59.6	3	6.4	0	0.0	16	31
16	Nagaland	12	4	33.3	1	8.3	1	8.3	3	25.0	3	25.0	0	0.0	6	6
17	Odisha	1181	500	42.3	21	1.8	2	0.2	599	50.7	50	4.2	9	0.8	523	658
18	Punjab	178	38	21.3	6	3.4	1	0.6	72	40.4	37	20.8	24	13.5	45	133
19	Rajasthan	881	263	29.9	102	11.6	77	8.7	233	26.4	89	10.1	117	13.3	442	439
20	Tamil Nadu	832	300	36.1	128	15.4	138	16.6	227	27.3	31	3.7	8	1.0	566	266
21	Telangana	575	219	38.1	93	16.2	91	15.8	87	15.1	29	5.0	51	8.9	403	167
22	Tripura	72	35	48.6	3	4.2	0	0.0	31	43.1	3	4.2	0	0.0	38	34
23	Uttar Pradesh	683	363	53.1	35	5.1	10	1.5	236	34.6	27	4.0	12	1.8	408	275
24	Uttarakhand	150	67	44.7	11	7.3	4	2.7	45	30.0	13	8.7	10	6.7	82	68
25	West Bengal	638	330	51.7	28	4.4	10	1.6	234	36.7	27	4.2	9	1.4	368	270
26	Chandigarh	12	5	41.7	0	0.0	1	8.3	4	33.3	0	0.0	2	16.7	6	6
27	Daman & Diu and Dadra & Nagar Haveli	5	1	20.0	0	0.0	0	0.0	3	60.0	1	20.0	0	0.0	1	4
28	Delhi	109	22	20.2	19	17.4	51	46.8	10	9.2	6	5.5	1	0.9	92	17
29	Jammu and Kashmir	28	8	28.6	0	0.0	0	0.0	20	71.4	0	0.0	0	0.0	8	20
30	Puducherry	8	1	12.5	0	0.0	0	0.0	7	87.5	0	0.0	0	0.0	1	7
	Total	14283	5966	41.8	1305	9.1	802	5.6	5019	35.1	772	5.4	410	2.9	8073	6201

State-wise Depth to Water Level Distribution of Percentage of Observation Wells Pre-Monsoon 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	171	0.75	155.42	8	4.7	42	24.6	55	32.2	44	25.7	12	7.0	10	5.8
2	Arunachal Pradesh	4	4.76	6.20	0	0.0	1	25.0	3	75.0	0	0.0	0	0.0	0	0.0
3	Assam	27	0.57	16.75	2	7.4	15	55.6	8	29.6	2	7.4	0	0.0	0	0.0
4	Bihar	10	3.90	18.50	0	0.0	1	10.0	3	30.0	6	60.0	0	0.0	0	0.0
5	Chhattisgarh	105	2.35	46.72	0	0.0	10	9.5	44	41.9	41	39.0	8	7.6	2	1.9
6	Goa	30	1.15	25.75	1	3.3	7	23.3	12	40.0	8	26.7	2	6.7	0	0.0
7	Gujarat	105	3.37	195.72	0	0.0	9	8.6	13	12.4	8	7.6	20	19.0	55	52.4
8	Haryana	144	1.22	92.00	3	2.1	8	5.6	13	9.0	34	23.6	48	33.3	38	26.4
9	Himachal Pradesh	1	2.50	2.50	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0
10	Jharkhand	10	4.50	33.00	0	0.0	1	10.0	3	30.0	5	50.0	1	10.0	0	0.0
11	Karnataka	226	0.04	97.50	14	6.2	35	15.5	58	25.7	75	33.2	38	16.8	6	2.7
12	Kerala	59	0.82	50.00	5	8.5	7	11.9	17	28.8	21	35.6	7	11.9	2	3.4
13	Madhya Pradesh	106	3.08	55.14	0	0.0	2	1.9	22	20.8	40	37.7	36	34.0	6	5.7
14	Maharashtra	74	3.00	150.70	0	0.0	8	10.8	27	36.5	22	29.7	9	12.2	8	10.8
15	Meghalaya	9	2.17	32.78	0	0.0	4	44.4	1	11.1	2	22.2	2	22.2	0	0.0
16	Odisha	98	0.32	52.05	5	5.1	31	31.6	36	36.7	20	20.4	4	4.1	2	2.0
17	Punjab	65	2.68	77.80	0	0.0	2	3.1	5	7.7	18	27.7	33	50.8	7	10.8
18	Tamil Nadu	278	0.01	89.49	25	9.0	81	29.1	69	24.8	41	14.7	24	8.6	38	13.7
19	Telangana	259	0.71	132.85	14	5.4	51	19.7	83	32.0	73	28.2	28	10.8	10	3.9
20	Tripura	3	3.37	15.42	0	0.0	1	33.3	1	33.3	1	33.3	0	0.0	0	0.0
21	Uttar Pradesh	23	3.78	31.64	0	0.0	2	8.7	11	47.8	5	21.7	5	21.7	0	0.0
22	Uttarakhand	4	8.40	86.62	0	0.0	0	0.0	1	25.0	0	0.0	0	0.0	3	75.0
23	West Bengal	614	0.30	30.00	4	0.7	108	17.6	204	33.2	248	40.4	50	8.1	0	0.0
24	Andaman and Nicobar	2	3.51	7.19	0	0.0	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0
25	Chandigarh	6	19.33	63.41	0	0.0	0	0.0	0	0.0	1	16.7	1	16.7	4	66.7
26	Delhi	6	12.40	66.01	0	0.0	0	0.0	0	0.0	1	16.7	2	33.3	3	50.0
27	Jammu and Kashmir	4	7.47	15.74	0	0.0	0	0.0	2	50.0	2	50.0	0	0.0	0	0.0
28	Puducherry	7	5.85	24.85	0	0.0	0	0.0	1	14.3	0	0.0	6	85.7	0	0.0
	Total	2450	0.01	195.72	81	3.3	428	17.5	693	28.3	718	29.3	336	13.7	194	7.9

State-wise Depth to Water Level Distribution of Percentage of Observation Wells August 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	290	0.01	177.30	35	12.1	75	25.9	85	29.3	69	23.8	19	6.6	7	2.4
2	Arunachal Pradesh	4	2.10	2.64	0	0.0	4	100.0	0	0.0	0	0.0	0	0.0	0	0.0
3	Assam	28	0.10	22.66	12	42.9	10	35.7	5	17.9	0	0.0	1	3.6	0	0.0
4	Bihar	43	0.83	19.64	4	9.3	13	30.2	14	32.6	12	27.9	0	0.0	0	0.0
5	Chhattisgarh	131	0.65	58.00	10	7.6	47	35.9	41	31.3	29	22.1	3	2.3	1	0.8
6	Goa	21	0.72	18.56	6	28.6	6	28.6	3	14.3	6	28.6	0	0.0	0	0.0
7	Gujarat	102	0.41	265.30	5	4.9	5	4.9	7	6.9	16	15.7	14	13.7	55	53.9
8	Haryana	81	0.55	96.10	2	2.5	3	3.7	4	4.9	21	25.9	34	42.0	17	21.0
9	Himachal Pradesh	2	0.87	3.44	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0	0	0.0
10	Jharkhand	92	0.12	27.60	8	8.7	29	31.5	32	34.8	16	17.4	7	7.6	0	0.0
11	Karnataka	200	0.10	64.60	30	15.0	61	30.5	46	23.0	44	22.0	18	9.0	1	0.5
12	Kerala	63	0.60	48.60	8	12.7	8	12.7	26	41.3	16	25.4	4	6.3	1	1.6
13	Madhya Pradesh	132	0.01	41.82	24	18.2	42	31.8	36	27.3	21	15.9	8	6.1	1	0.8
14	Maharashtra	75	0.30	51.00	11	14.7	29	38.7	21	28.0	8	10.7	4	5.3	2	2.7
15	Meghalaya	12	2.03	41.40	0	0.0	4	33.3	5	41.7	0	0.0	2	16.7	1	8.3
16	Odisha	101	0.03	27.91	27	26.7	36	35.6	23	22.8	12	11.9	3	3.0	0	0.0
17	Punjab	62	1.77	65.34	2	3.2	1	1.6	1	1.6	20	32.3	28	45.2	10	16.1
18	Tamil Nadu	270	0.80	100.00	19	7.0	62	23.0	87	32.2	43	15.9	26	9.6	33	12.2
19	Telangana	465	0.01	67.47	180	38.7	133	28.6	81	17.4	49	10.5	17	3.7	5	1.1
20	Tripura	5	2.90	14.23	0	0.0	3	60.0	1	20.0	1	20.0	0	0.0	0	0.0
21	Uttar Pradesh	14	4.30	32.19	0	0.0	1	7.1	9	64.3	2	14.3	2	14.3	0	0.0
22	Uttarakhand	3	7.80	64.75	0	0.0	0	0.0	1	33.3	0	0.0	0	0.0	2	66.7
23	West Bengal	754	0.32	32.41	22	2.9	188	24.9	233	30.9	257	34.1	54	7.2	0	0.0
24	Chandigarh	7	14.97	63.70	0	0.0	0	0.0	0	0.0	2	28.6	2	28.6	3	42.9
25	Delhi	6	13.41	66.51	0	0.0	0	0.0	0	0.0	1	16.7	2	33.3	3	50.0
26	Jammu and Kashmir	7	4.72	15.08	0	0.0	1	14.3	3	42.9	3	42.9	0	0.0	0	0.0
27	Puducherry	5	19.20	24.36	0	0.0	0	0.0	0	0.0	2	40.0	3	60.0	0	0.0
	Total	2975	0.01	265.30	406	13.6	762	25.6	764	25.7	650	21.8	251	8.4	142	4.8

State-wise Depth to Water Level Distribution of Percentage of Observation Wells November 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	291	0.01	84.40	68	23.4	83	28.5	69	23.7	59	20.3	9	3.1	3	1.0
2	Arunachal Pradesh	4	1.54	3.75	1	25.0	3	75.0	0	0.0	0	0.0	0	0.0	0	0.0
3	Assam	43	0.55	23.30	11	25.6	21	48.8	9	20.9	1	2.3	1	2.3	0	0.0
4	Bihar	60	1.44	14.30	3	5.0	30	50.0	21	35.0	6	10.0	0	0.0	0	0.0
5	Chhattisgarh	163	1.35	58.00	3	1.8	49	30.1	64	39.3	41	25.2	5	3.1	1	0.6
6	Goa	38	1.15	25.10	5	13.2	11	28.9	11	28.9	8	21.1	3	7.9	0	0.0
7	Gujarat	103	1.67	191.17	2	1.9	13	12.6	8	7.8	12	11.7	17	16.5	51	49.5
8	Haryana	157	0.60	92.30	3	1.9	8	5.1	15	9.6	39	24.8	54	34.4	38	24.2
9	Himachal Pradesh	2	1.63	4.85	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0	0	0.0
10	Jharkhand	88	0.51	26.35	2	2.3	26	29.5	35	39.8	20	22.7	5	5.7	0	0.0
11	Karnataka	246	0.05	122.20	31	12.6	83	33.7	57	23.2	54	22.0	19	7.7	2	0.8
12	Kerala	68	0.50	49.53	7	10.3	9	13.2	27	39.7	19	27.9	5	7.4	1	1.5
13	Madhya Pradesh	173	0.40	47.84	10	5.8	56	32.4	54	31.2	38	22.0	14	8.1	1	0.6
14	Maharashtra	77	0.10	56.20	6	7.8	27	35.1	15	19.5	16	20.8	10	13.0	3	3.9
15	Meghalaya	12	2.03	41.75	0	0.0	3	25.0	4	33.3	2	16.7	2	16.7	1	8.3
16	Odisha	212	0.15	44.52	27	12.7	81	38.2	66	31.1	30	14.2	7	3.3	1	0.5
17	Punjab	72	1.46	61.90	2	2.8	3	4.2	7	9.7	21	29.2	30	41.7	9	12.5
18	Tamil Nadu	373	0.22	93.65	46	12.3	113	30.3	88	23.6	55	14.7	31	8.3	40	10.7
19	Telangana	415	0.02	58.73	126	30.4	133	32.0	97	23.4	44	10.6	10	2.4	5	1.2
20	Tripura	5	2.97	14.36	0	0.0	3	60.0	1	20.0	1	20.0	0	0.0	0	0.0
21	Uttar Pradesh	80	1.05	36.76	9	11.3	23	28.8	27	33.8	11	13.8	10	12.5	0	0.0
22	Uttarakhand	12	0.47	79.10	2	16.7	2	16.7	3	25.0	2	16.7	0	0.0	3	25.0
23	West Bengal	758	0.39	30.49	30	4.0	148	19.5	281	37.1	240	31.7	59	7.8	0	0.0
24	Andaman and Nicobar	2	2.16	10.34	0	0.0	1	50.0	0	0.0	1	50.0	0	0.0	0	0.0
25	Chandigarh	6	14.96	64.44	0	0.0	0	0.0	0	0.0	2	33.3	1	16.7	3	50.0
26	Delhi	6	13.08	66.75	0	0.0	0	0.0	0	0.0	1	16.7	2	33.3	3	50.0
27	Jammu and Kashmir	7	6.02	15.60	0	0.0	0	0.0	3	42.9	4	57.1	0	0.0	0	0.0
28	Puducherry	7	3.89	23.19	0	0.0	1	14.3	0	0.0	3	42.9	3	42.9	0	0.0
	Total	3480	0.01	191.17	395	11.4	931	26.8	962	27.6	730	21.0	297	8.5	165	4.7

State-wise Depth to Water Level Distribution of Percentage of Observation Wells January 2023 in Deeper Aquifer

Sr. No.	State/UT Name	No of well analysed	DTWL, mbgl		No./Percentage of wells showing depth to water level (mbgl) in the range of											
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Andhra Pradesh	390	0.01	74.90	62	15.9	101	25.9	132	33.8	68	17.4	19	4.9	8	2.1
2	Arunachal Pradesh	4	1.81	5.59	1	25.0	2	50.0	1	25.0	0	0.0	0	0.0	0	0.0
3	Assam	49	0.65	26.96	10	20.4	19	38.8	17	34.7	2	4.1	1	2.0	0	0.0
4	Bihar	59	1.35	22.02	1	1.7	18	30.5	30	50.8	9	15.3	1	1.7	0	0.0
5	Chhattisgarh	147	1.57	58.00	1	0.7	28	19.0	52	35.4	52	35.4	13	8.8	1	0.7
6	Goa	40	1.00	24.16	4	10.0	7	17.5	16	40.0	10	25.0	3	7.5	0	0.0
7	Gujarat	111	2.47	198.83	0	0.0	12	10.8	11	9.9	13	11.7	22	19.8	53	47.7
8	Haryana	85	0.90	67.61	2	2.4	4	4.7	10	11.8	21	24.7	30	35.3	18	21.2
9	Himachal Pradesh	1	1.47	1.47	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	Jharkhand	94	1.70	33.12	2	2.1	11	11.7	46	48.9	26	27.7	9	9.6	0	0.0
11	Karnataka	266	1.05	128.00	13	4.9	51	19.2	102	38.3	73	27.4	23	8.6	4	1.5
12	Kerala	66	0.01	54.27	6	9.1	10	15.2	17	25.8	23	34.8	9	13.6	1	1.5
13	Madhya Pradesh	170	0.50	199.45	1	0.6	18	10.6	57	33.5	54	31.8	29	17.1	11	6.5
14	Maharashtra	78	1.74	51.00	2	2.6	15	19.2	32	41.0	12	15.4	13	16.7	4	5.1
15	Meghalaya	13	1.86	48.16	1	7.7	3	23.1	3	23.1	1	7.7	3	23.1	2	15.4
16	Odisha	199	0.29	46.95	15	7.5	46	23.1	89	44.7	37	18.6	10	5.0	2	1.0
17	Punjab	63	1.27	59.59	1	1.6	5	7.9	6	9.5	18	28.6	25	39.7	8	12.7
18	Tamil Nadu	380	0.50	94.50	40	10.5	117	30.8	100	26.3	49	12.9	33	8.7	41	10.8
19	Telangana	504	0.09	57.84	81	16.1	167	33.1	157	31.2	71	14.1	20	4.0	8	1.6
20	Tripura	4	3.15	8.00	0	0.0	2	50.0	2	50.0	0	0.0	0	0.0	0	0.0
21	Uttar Pradesh	103	0.10	31.44	6	5.8	34	33.0	24	23.3	25	24.3	14	13.6	0	0.0
22	Uttarakhand	11	2.86	84.30	0	0.0	3	27.3	3	27.3	2	18.2	0	0.0	3	27.3
23	West Bengal	785	0.37	29.98	5	0.6	97	12.4	294	37.5	307	39.1	82	10.4	0	0.0
24	Chandigarh	8	10.24	63.10	0	0.0	0	0.0	0	0.0	4	50.0	2	25.0	2	25.0
25	Delhi	6	13.51	66.60	0	0.0	0	0.0	0	0.0	1	16.7	2	33.3	3	50.0
26	Jammu and Kashmir	6	6.03	15.31	0	0.0	0	0.0	3	50.0	3	50.0	0	0.0	0	0.0
27	Puducherry	7	4.16	22.75	0	0.0	1	14.3	0	0.0	4	57.1	2	28.6	0	0.0
	Total	3649	0.01	199.45	255	7.0	771	21.1	1204	33.0	885	24.3	365	10.0	169	4.6

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2021 to Pre-Monsoon 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Arunachal Pradesh	4	0	0.0	0	0.0	1	25.0	1	25.0	2	50.0	0	0.0	1	3
2	Assam	10	5	50.0	1	10.0	0	0.0	4	40.0	0	0.0	0	0.0	6	4
3	Bihar	4	1	25.0	0	0.0	0	0.0	1	25.0	1	25.0	1	25.0	1	3
4	Chhattisgarh	55	8	14.5	4	7.3	1	1.8	17	30.9	13	23.6	12	21.8	13	42
5	Gujarat	94	17	18.1	4	4.3	3	3.2	44	46.8	12	12.8	14	14.9	24	70
6	Haryana	85	30	35.3	4	4.7	2	2.4	39	45.9	9	10.6	0	0.0	36	48
7	Jharkhand	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	0	1
8	Kerala	43	21	48.8	1	2.3	5	11.6	13	30.2	0	0.0	3	7.0	27	16
9	Madhya Pradesh	91	21	23.1	4	4.4	19	20.9	26	28.6	9	9.9	12	13.2	44	47
10	Meghalaya	6	3	50.0	0	0.0	0	0.0	2	33.3	0	0.0	1	16.7	3	3
11	Odisha	33	15	45.5	3	9.1	1	3.0	12	36.4	1	3.0	1	3.0	19	14
12	Punjab	53	19	35.8	2	3.8	1	1.9	20	37.7	7	13.2	4	7.5	22	31
13	Tamil Nadu	149	58	38.9	21	14.1	37	24.8	22	14.8	6	4.0	5	3.4	116	33
14	Telangana	44	14	31.8	4	9.1	6	13.6	13	29.5	1	2.3	6	13.6	24	20
15	Tripura	3	0	0.0	0	0.0	0	0.0	3	100.0	0	0.0	0	0.0	0	3
16	Uttar Pradesh	7	5	71.4	0	0.0	0	0.0	2	28.6	0	0.0	0	0.0	5	2
17	Uttarakhand	4	1	25.0	0	0.0	1	25.0	1	25.0	0	0.0	1	25.0	2	2
18	West Bengal	347	130	37.5	56	16.1	41	11.8	72	20.7	21	6.1	26	7.5	227	119
19	Chandigarh	5	1	20.0	0	0.0	1	20.0	2	40.0	1	20.0	0	0.0	2	3
20	Delhi	5	0	0.0	2	40.0	1	20.0	2	40.0	0	0.0	0	0.0	3	2
21	Jammu and Kashmir	4	2	50.0	0	0.0	1	25.0	1	25.0	0	0.0	0	0.0	3	1
22	Puducherry	7	1	14.3	0	0.0	0	0.0	3	42.9	2	28.6	1	14.3	1	6
	Total	1054	352	33.4	106	10.1	121	11.5	300	28.5	85	8.1	88	8.3	579	473

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from August 2021 to August 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	72	17	23.6	10	13.9	12	16.7	16	22.2	11	15.3	6	8.3	39	33
2	Arunachal Pradesh	4	4	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0
3	Assam	10	4	40.0	0	0.0	0	0.0	4	40.0	2	20.0	0	0.0	4	6
4	Bihar	3	0	0.0	0	0.0	0	0.0	1	33.3	0	0.0	2	66.7	0	3
5	Chhattisgarh	90	22	24.4	12	13.3	11	12.2	22	24.4	11	12.2	10	11.1	45	43
6	Goa	21	11	52.4	3	14.3	0	0.0	7	33.3	0	0.0	0	0.0	14	7
7	Gujarat	78	26	33.3	10	12.8	14	17.9	16	20.5	2	2.6	10	12.8	50	28
8	Haryana	46	16	34.8	8	17.4	6	13.0	10	21.7	1	2.2	5	10.9	30	16
9	Himachal Pradesh	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
10	Jharkhand	11	0	0.0	2	18.2	4	36.4	2	18.2	2	18.2	1	9.1	6	5
11	Karnataka	178	35	19.7	22	12.4	87	48.9	22	12.4	8	4.5	4	2.2	144	34
12	Kerala	46	20	43.5	2	4.3	3	6.5	16	34.8	2	4.3	3	6.5	25	21
13	Madhya Pradesh	123	33	26.8	19	15.4	38	30.9	17	13.8	3	2.4	12	9.8	90	32
14	Maharashtra	34	13	38.2	3	8.8	3	8.8	13	38.2	1	2.9	1	2.9	19	15
15	Meghalaya	5	0	0.0	0	0.0	1	20.0	4	80.0	0	0.0	0	0.0	1	4
16	Nagaland	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
17	Odisha	66	42	63.6	11	16.7	3	4.5	6	9.1	2	3.0	2	3.0	56	10
18	Punjab	44	23	52.3	3	6.8	5	11.4	6	13.6	4	9.1	3	6.8	31	13
19	Tamil Nadu	241	51	21.2	35	14.5	65	27.0	66	27.4	13	5.4	10	4.1	151	89
20	Telangana	340	44	12.9	29	8.5	29	8.5	72	21.2	40	11.8	79	23.2	102	191
21	Tripura	5	3	60.0	0	0.0	0	0.0	2	40.0	0	0.0	0	0.0	3	2
22	Uttar Pradesh	8	3	37.5	0	0.0	0	0.0	5	62.5	0	0.0	0	0.0	3	5
23	Uttarakhand	4	0	0.0	1	25.0	0	0.0	1	25.0	2	50.0	0	0.0	1	3
24	West Bengal	502	62	12.4	19	3.8	20	4.0	200	39.8	126	25.1	75	14.9	101	401
25	Chandigarh	7	4	57.1	2	28.6	0	0.0	1	14.3	0	0.0	0	0.0	6	1
26	Delhi	6	1	16.7	3	50.0	0	0.0	2	33.3	0	0.0	0	0.0	4	2
27	Jammu and Kashmir	5	1	20.0	0	0.0	2	40.0	1	20.0	0	0.0	1	20.0	3	2
28	Puducherry	5	1	20.0	2	40.0	0	0.0	1	20.0	1	20.0	0	0.0	3	2
	Total	1956	438	22.4	196	10.0	303	15.5	513	26.2	231	11.8	224	11.5	937	968

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from November 2021 to November 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	91	29	31.9	5	5.5	20	22.0	21	23.1	8	8.8	7	7.7	54	36
2	Arunachal Pradesh	4	3	75.0	1	25.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0
3	Assam	19	9	47.4	4	21.1	0	0.0	4	21.1	1	5.3	1	5.3	13	6
4	Bihar	6	0	0.0	0	0.0	0	0.0	3	50.0	2	33.3	1	16.7	0	6
5	Chhattisgarh	110	29	26.4	12	10.9	7	6.4	35	31.8	19	17.3	6	5.5	48	60
6	Goa	36	8	22.2	1	2.8	0	0.0	19	52.8	5	13.9	2	5.6	9	26
7	Gujarat	82	22	26.8	11	13.4	8	9.8	27	32.9	8	9.8	6	7.3	41	41
8	Haryana	95	33	34.7	6	6.3	3	3.2	44	46.3	5	5.3	2	2.1	42	51
9	Himachal Pradesh	1	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	1
10	Jharkhand	6	1	16.7	0	0.0	1	16.7	2	33.3	2	33.3	0	0.0	2	4
11	Karnataka	172	37	21.5	20	11.6	53	30.8	40	23.3	16	9.3	6	3.5	110	62
12	Kerala	44	5	11.4	2	4.5	0	0.0	24	54.5	6	13.6	7	15.9	7	37
13	Madhya Pradesh	105	41	39.0	16	15.2	20	19.0	15	14.3	3	2.9	8	7.6	77	26
14	Maharashtra	31	8	25.8	3	9.7	4	12.9	12	38.7	1	3.2	2	6.5	15	15
15	Meghalaya	8	4	50.0	1	12.5	0	0.0	2	25.0	1	12.5	0	0.0	5	3
16	Nagaland	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
17	Odisha	84	35	41.7	6	7.1	1	1.2	33	39.3	2	2.4	5	6.0	42	40
18	Punjab	29	12	41.4	2	6.9	1	3.4	11	37.9	1	3.4	2	6.9	15	14
19	Tamil Nadu	228	42	18.4	28	12.3	34	14.9	73	32.0	33	14.5	17	7.5	104	123
20	Telangana	160	69	43.1	20	12.5	14	8.8	39	24.4	9	5.6	8	5.0	103	56
21	Tripura	5	3	60.0	0	0.0	0	0.0	2	40.0	0	0.0	0	0.0	3	2
22	Uttar Pradesh	6	2	33.3	0	0.0	0	0.0	3	50.0	0	0.0	1	16.7	2	4
23	Uttarakhand	4	2	50.0	0	0.0	1	25.0	1	25.0	0	0.0	0	0.0	3	1
24	West Bengal	553	40	7.2	14	2.5	18	3.3	202	36.5	179	32.4	100	18.1	72	481
25	Andaman and Nicobar	2	0	0.0	0	0.0	0	0.0	1	50.0	1	50.0	0	0.0	0	2
26	Chandigarh	5	2	40.0	0	0.0	0	0.0	2	40.0	1	20.0	0	0.0	2	3
27	Delhi	6	0	0.0	3	50.0	0	0.0	2	33.3	0	0.0	1	16.7	3	3
28	Puducherry	7	5	71.4	1	14.3	0	0.0	1	14.3	0	0.0	0	0.0	6	1
	Total	1900	442	23.3	156	8.2	185	9.7	619	32.6	303	15.9	182	9.6	783	1104

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from January 2023 to January 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	97	22	22.7	7	7.2	6	6.2	37	38.1	12	12.4	13	13.4	35	62
2	Assam	25	13	52.0	1	4.0	0	0.0	8	32.0	2	8.0	1	4.0	14	11
3	Chhattisgarh	95	37	38.9	9	9.5	4	4.2	28	29.5	7	7.4	10	10.5	50	45
4	Goa	34	8	23.5	1	2.9	0	0.0	23	67.6	1	2.9	0	0.0	9	24
5	Gujarat	87	28	32.2	9	10.3	4	4.6	28	32.2	9	10.3	9	10.3	41	46
6	Haryana	55	18	32.7	5	9.1	1	1.8	28	50.9	2	3.6	0	0.0	24	30
7	Jharkhand	8	0	0.0	0	0.0	0	0.0	3	37.5	3	37.5	2	25.0	0	8
8	Karnataka	165	21	12.7	9	5.5	36	21.8	64	38.8	15	9.1	19	11.5	66	98
9	Kerala	51	10	19.6	2	3.9	2	3.9	23	45.1	6	11.8	8	15.7	14	37
10	Madhya Pradesh	98	21	21.4	4	4.1	8	8.2	28	28.6	9	9.2	25	25.5	33	62
11	Maharashtra	44	9	20.5	0	0.0	7	15.9	19	43.2	3	6.8	6	13.6	16	28
12	Meghalaya	9	6	66.7	0	0.0	0	0.0	3	33.3	0	0.0	0	0.0	6	3
13	Odisha	89	17	19.1	2	2.2	3	3.4	49	55.1	7	7.9	11	12.4	22	67
14	Punjab	32	3	9.4	1	3.1	0	0.0	20	62.5	5	15.6	3	9.4	4	28
15	Tamil Nadu	254	38	15.0	14	5.5	16	6.3	115	45.3	38	15.0	33	13.0	68	186
16	Telangana	391	91	23.3	17	4.3	15	3.8	117	29.9	50	12.8	94	24.0	123	261
17	Tripura	3	2	66.7	0	0.0	0	0.0	1	33.3	0	0.0	0	0.0	2	1
18	Uttar Pradesh	8	2	25.0	0	0.0	0	0.0	5	62.5	1	12.5	0	0.0	2	6
19	Uttarakhand	5	2	40.0	0	0.0	0	0.0	1	20.0	2	40.0	0	0.0	2	3
20	West Bengal	499	41	8.2	7	1.4	8	1.6	178	35.7	143	28.7	122	24.4	56	443
21	Chandigarh	6	3	50.0	1	16.7	0	0.0	2	33.3	0	0.0	0	0.0	4	2
22	Delhi	6	0	0.0	3	50.0	0	0.0	2	33.3	1	16.7	0	0.0	3	3
23	Puducherry	7	1	14.3	1	14.3	1	14.3	4	57.1	0	0.0	0	0.0	3	4
	Total	2068	393	19.0	93	4.5	111	5.4	786	38.0	316	15.3	356	17.2	597	1458

State-wise Seasonal Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2022 to August 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	146	52	35.6	17	11.6	26	17.8	34	23.3	6	4.1	10	6.8	95	50
2	Arunachal Pradesh	4	0	0.0	4	100.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0
3	Assam	22	10	45.5	9	40.9	0	0.0	2	9.1	1	4.5	0	0.0	19	3
4	Bihar	5	4	80.0	0	0.0	1	20.0	0	0.0	0	0.0	0	0.0	5	0
5	Chhattisgarh	92	16	17.4	13	14.1	49	53.3	9	9.8	1	1.1	4	4.3	78	14
6	Goa	18	5	27.8	5	27.8	7	38.9	1	5.6	0	0.0	0	0.0	17	1
7	Gujarat	84	21	25.0	11	13.1	35	41.7	8	9.5	1	1.2	7	8.3	67	16
8	Haryana	54	7	13.0	2	3.7	3	5.6	12	22.2	13	24.1	17	31.5	12	42
9	Himachal Pradesh	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
10	Jharkhand	8	0	0.0	1	12.5	6	75.0	1	12.5	0	0.0	0	0.0	7	1
11	Karnataka	163	44	27.0	33	20.2	68	41.7	8	4.9	4	2.5	5	3.1	145	17
12	Kerala	55	19	34.5	17	30.9	11	20.0	3	5.5	2	3.6	2	3.6	47	7
13	Madhya Pradesh	95	7	7.4	6	6.3	72	75.8	2	2.1	4	4.2	4	4.2	85	10
14	Maharashtra	63	12	19.0	11	17.5	35	55.6	3	4.8	1	1.6	1	1.6	58	5
15	Meghalaya	9	2	22.2	4	44.4	2	22.2	1	11.1	0	0.0	0	0.0	8	1
16	Nagaland	1	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	0
17	Odisha	92	29	31.5	31	33.7	27	29.3	2	2.2	2	2.2	0	0.0	87	4
18	Punjab	43	4	9.3	2	4.7	1	2.3	11	25.6	14	32.6	10	23.3	7	35
19	Tamil Nadu	251	56	22.3	9	3.6	13	5.2	114	45.4	29	11.6	28	11.2	78	171
20	Telangana	254	44	17.3	73	28.7	124	48.8	4	1.6	3	1.2	6	2.4	241	13
21	Tripura	3	3	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0
22	Uttar Pradesh	13	5	38.5	0	0.0	0	0.0	8	61.5	0	0.0	0	0.0	5	8
23	Uttarakhand	4	2	50.0	0	0.0	1	25.0	1	25.0	0	0.0	0	0.0	3	1
24	West Bengal	586	240	41.0	95	16.2	70	11.9	142	24.2	21	3.6	14	2.4	405	177
25	Chandigarh	5	2	40.0	0	0.0	0	0.0	3	60.0	0	0.0	0	0.0	2	3
26	Delhi	6	4	66.7	0	0.0	0	0.0	2	33.3	0	0.0	0	0.0	4	2
27	Jammu and Kashmir	4	1	25.0	1	25.0	1	25.0	0	0.0	1	25.0	0	0.0	3	1
28	Puducherry	5	1	20.0	2	40.0	0	0.0	2	40.0	0	0.0	0	0.0	3	2
	Total	2086	591	28.3	346	16.6	553	26.5	373	17.9	103	4.9	108	5.2	1490	584

State-wise Seasonal Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2022 to November 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	144	57	39.6	29	20.1	42	29.2	9	6.3	2	1.4	3	2.1	128	14
2	Arunachal Pradesh	4	1	25.0	2	50.0	1	25.0	0	0.0	0	0.0	0	0.0	4	0
3	Assam	28	16	57.1	10	35.7	0	0.0	1	3.6	1	3.6	0	0.0	26	2
4	Bihar	5	1	20.0	2	40.0	1	20.0	1	20.0	0	0.0	0	0.0	4	1
5	Chhattisgarh	97	17	17.5	29	29.9	32	33.0	13	13.4	3	3.1	3	3.1	78	19
6	Goa	31	22	71.0	2	6.5	2	6.5	3	9.7	1	3.2	1	3.2	26	5
7	Gujarat	87	25	28.7	14	16.1	29	33.3	13	14.9	2	2.3	3	3.4	68	18
8	Haryana	123	49	39.8	11	8.9	1	0.8	46	37.4	12	9.8	4	3.3	61	62
9	Himachal Pradesh	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
10	Jharkhand	8	1	12.5	1	12.5	6	75.0	0	0.0	0	0.0	0	0.0	8	0
11	Karnataka	209	46	22.0	46	22.0	96	45.9	11	5.3	6	2.9	3	1.4	188	20
12	Kerala	57	30	52.6	11	19.3	6	10.5	7	12.3	0	0.0	3	5.3	47	10
13	Madhya Pradesh	98	8	8.2	11	11.2	72	73.5	3	3.1	2	2.0	2	2.0	91	7
14	Maharashtra	66	15	22.7	16	24.2	29	43.9	0	0.0	2	3.0	4	6.1	60	6
15	Meghalaya	8	3	37.5	1	12.5	2	25.0	2	25.0	0	0.0	0	0.0	6	2
16	Nagaland	1	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	0
17	Odisha	88	38	43.2	30	34.1	14	15.9	5	5.7	0	0.0	0	0.0	82	5
18	Punjab	36	6	16.7	1	2.8	1	2.8	21	58.3	6	16.7	1	2.8	8	28
19	Tamil Nadu	254	92	36.2	44	17.3	33	13.0	58	22.8	11	4.3	13	5.1	169	82
20	Telangana	246	42	17.1	60	24.4	130	52.8	7	2.8	5	2.0	2	0.8	232	14
21	Tripura	3	3	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0
22	Uttar Pradesh	21	12	57.1	2	9.5	2	9.5	3	14.3	0	0.0	1	4.8	16	4
23	Uttarakhand	4	1	25.0	0	0.0	3	75.0	0	0.0	0	0.0	0	0.0	4	0
24	West Bengal	588	209	35.5	106	18.0	84	14.3	145	24.7	23	3.9	20	3.4	399	188
25	Andaman and Nicobar	2	1	50.0	0	0.0	0	0.0	0	0.0	1	50.0	0	0.0	1	1
26	Chandigarh	5	2	40.0	1	20.0	0	0.0	2	40.0	0	0.0	0	0.0	3	2
27	Delhi	6	2	33.3	0	0.0	1	16.7	3	50.0	0	0.0	0	0.0	3	3
28	Jammu and Kashmir	4	2	50.0	0	0.0	1	25.0	0	0.0	1	25.0	0	0.0	3	1
29	Puducherry	7	3	42.9	1	14.3	3	42.9	0	0.0	0	0.0	0	0.0	7	0
	Total	2231	705	31.6	430	19.3	592	26.5	353	15.8	78	3.5	63	2.8	1727	494

State-wise Seasonal Fluctuation & Frequency Distribution of Different Ranges from Pre-Monsoon 2022 to January 2023 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	152	64	42.1	31	20.4	41	27.0	10	6.6	0	0.0	5	3.3	136	15
2	Arunachal Pradesh	4	0	0.0	3	75.0	0	0.0	1	25.0	0	0.0	0	0.0	3	1
3	Assam	29	18	62.1	2	6.9	0	0.0	6	20.7	2	6.9	1	3.4	20	9
4	Bihar	5	0	0.0	0	0.0	2	40.0	3	60.0	0	0.0	0	0.0	2	3
5	Chhattisgarh	90	18	20.0	19	21.1	25	27.8	6	6.7	9	10.0	13	14.4	62	28
6	Goa	30	21	70.0	1	3.3	1	3.3	5	16.7	1	3.3	1	3.3	23	7
7	Gujarat	89	36	40.4	13	14.6	10	11.2	13	14.6	8	9.0	9	10.1	59	30
8	Haryana	53	26	49.1	2	3.8	5	9.4	16	30.2	4	7.5	0	0.0	33	20
9	Himachal Pradesh	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
10	Jharkhand	8	0	0.0	3	37.5	1	12.5	2	25.0	1	12.5	1	12.5	4	4
11	Karnataka	208	51	24.5	21	10.1	59	28.4	41	19.7	19	9.1	16	7.7	131	76
12	Kerala	53	19	35.8	5	9.4	3	5.7	19	35.8	3	5.7	4	7.5	27	26
13	Madhya Pradesh	96	17	17.7	17	17.7	51	53.1	4	4.2	2	2.1	5	5.2	85	11
14	Maharashtra	63	19	30.2	15	23.8	15	23.8	5	7.9	2	3.2	7	11.1	49	14
15	Meghalaya	9	5	55.6	2	22.2	0	0.0	2	22.2	0	0.0	0	0.0	7	2
16	Nagaland	1	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
17	Odisha	90	45	50.0	13	14.4	9	10.0	12	13.3	6	6.7	4	4.4	67	22
18	Punjab	31	12	38.7	1	3.2	2	6.5	13	41.9	2	6.5	1	3.2	15	16
19	Tamil Nadu	253	85	33.6	47	18.6	27	10.7	67	26.5	11	4.3	16	6.3	159	94
20	Telangana	256	85	33.2	52	20.3	98	38.3	15	5.9	1	0.4	5	2.0	235	21
21	Tripura	2	2	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0
22	Uttar Pradesh	22	13	59.1	4	18.2	1	4.5	3	13.6	1	4.5	0	0.0	18	4
23	Uttarakhand	4	1	25.0	1	25.0	2	50.0	0	0.0	0	0.0	0	0.0	4	0
24	West Bengal	552	139	25.2	49	8.9	32	5.8	231	41.8	59	10.7	42	7.6	220	332
25	Chandigarh	5	4	80.0	0	0.0	1	20.0	0	0.0	0	0.0	0	0.0	5	0
26	Delhi	6	2	33.3	0	0.0	1	16.7	3	50.0	0	0.0	0	0.0	3	3
27	Jammu and Kashmir	3	1	33.3	0	0.0	1	33.3	0	0.0	1	33.3	0	0.0	2	1
28	Puducherry	7	3	42.9	1	14.3	3	42.9	0	0.0	0	0.0	0	0.0	7	0
	Total	2122	687	32.4	303	14.3	390	18.4	477	22.5	132	6.2	130	6.1	1380	739

State-wise Decadal Water Level Fluctuation with Mean [Pre-monsoon (2012 to 2021)] and Pre-monsoon 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	37	9	24.3	7	18.9	11	29.7	2	5.4	3	8.1	5	13.5	27	10
2	Assam	10	7	70.0	1	10.0	0	0.0	2	20.0	0	0.0	0	0.0	8	2
3	Bihar	9	1	11.1	3	33.3	0	0.0	3	33.3	1	11.1	1	11.1	4	5
4	Chhattisgarh	76	25	32.9	9	11.8	12	15.8	16	21.1	7	9.2	7	9.2	46	30
5	Goa	31	9	29.0	0	0.0	1	3.2	20	64.5	1	3.2	0	0.0	10	21
6	Gujarat	86	15	17.4	12	14.0	17	19.8	15	17.4	6	7.0	21	24.4	44	42
7	Haryana	74	7	9.5	5	6.8	2	2.7	30	40.5	15	20.3	15	20.3	14	60
8	Karnataka	167	29	17.4	30	18.0	92	55.1	9	5.4	1	0.6	6	3.6	151	16
9	Kerala	54	25	46.3	5	9.3	10	18.5	11	20.4	2	3.7	1	1.9	40	14
10	Madhya Pradesh	101	19	18.8	7	6.9	41	40.6	19	18.8	5	5.0	10	9.9	67	34
11	Maharashtra	26	7	26.9	1	3.8	14	53.8	0	0.0	0	0.0	4	15.4	22	4
12	Meghalaya	4	0	0.0	0	0.0	0	0.0	4	100.0	0	0.0	0	0.0	0	4
13	Nagaland	1	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	0
14	Odisha	39	23	59.0	5	12.8	0	0.0	6	15.4	3	7.7	2	5.1	28	11
15	Punjab	45	2	4.4	0	0.0	0	0.0	16	35.6	14	31.1	13	28.9	2	43
16	Tamil Nadu	95	22	23.2	22	23.2	38	40.0	9	9.5	1	1.1	3	3.2	82	13
17	Telangana	29	8	27.6	2	6.9	11	37.9	2	6.9	0	0.0	6	20.7	21	8
18	Tripura	2	1	50.0	0	0.0	0	0.0	1	50.0	0	0.0	0	0.0	1	1
19	Uttar Pradesh	6	3	50.0	0	0.0	0	0.0	2	33.3	1	16.7	0	0.0	3	3
20	Uttarakhand	4	1	25.0	0	0.0	1	25.0	0	0.0	2	50.0	0	0.0	2	2
21	West Bengal	515	190	36.9	45	8.7	14	2.7	149	28.9	74	14.4	43	8.3	249	266
22	Andaman and Nicobar	2	0	0.0	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0	2	0
23	Chandigarh	4	0	0.0	0	0.0	1	25.0	1	25.0	1	25.0	1	25.0	1	3
24	Delhi	6	1	16.7	0	0.0	3	50.0	0	0.0	0	0.0	2	33.3	4	2
25	Puducherry	7	1	14.3	1	14.3	1	14.3	2	28.6	0	0.0	2	28.6	3	4
Total		1430	405	28.3	156	10.9	271	19.0	319	22.3	137	9.6	142	9.9	832	598

State-wise Decadal Water Level Fluctuation with Mean [August (2012 to 2021)] and August 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	54	6	11.1	8	14.8	30	55.6	2	3.7	4	7.4	4	7.4	44	10
2	Assam	10	4	40.0	2	20.0	0	0.0	4	40.0	0	0.0	0	0.0	6	4
3	Bihar	7	1	14.3	0	0.0	0	0.0	2	28.6	3	42.9	1	14.3	1	6
4	Chhattisgarh	98	20	20.4	11	11.2	10	10.2	25	25.5	13	13.3	19	19.4	41	57
5	Goa	21	7	33.3	1	4.8	0	0.0	12	57.1	1	4.8	0	0.0	8	13
6	Gujarat	76	12	15.8	10	13.2	15	19.7	7	9.2	9	11.8	23	30.3	37	39
7	Haryana	23	5	21.7	3	13.0	1	4.3	9	39.1	3	13.0	2	8.7	9	14
8	Karnataka	196	28	14.3	32	16.3	119	60.7	12	6.1	2	1.0	3	1.5	179	17
9	Kerala	55	20	36.4	5	9.1	3	5.5	18	32.7	5	9.1	4	7.3	28	27
10	Madhya Pradesh	131	30	22.9	38	29.0	35	26.7	15	11.5	3	2.3	10	7.6	103	28
11	Maharashtra	33	9	27.3	5	15.2	16	48.5	2	6.1	1	3.0	0	0.0	30	3
12	Meghalaya	6	2	33.3	0	0.0	1	16.7	3	50.0	0	0.0	0	0.0	3	3
13	Nagaland	1	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	0
14	Odisha	44	23	52.3	4	9.1	0	0.0	13	29.5	1	2.3	3	6.8	27	17
15	Punjab	38	3	7.9	2	5.3	1	2.6	9	23.7	9	23.7	14	36.8	6	32
16	Tamil Nadu	226	51	22.6	42	18.6	105	46.5	19	8.4	4	1.8	5	2.2	198	28
17	Telangana	293	25	8.5	22	7.5	74	25.3	53	18.1	37	12.6	82	28.0	121	172
18	Tripura	3	1	33.3	0	0.0	0	0.0	2	66.7	0	0.0	0	0.0	1	2
19	Uttar Pradesh	7	1	14.3	1	14.3	0	0.0	2	28.6	2	28.6	1	14.3	2	5
20	Uttarakhand	4	1	25.0	0	0.0	0	0.0	1	25.0	0	0.0	2	50.0	1	3
21	West Bengal	581	72	12.4	15	2.6	9	1.5	238	41.0	153	26.3	94	16.2	96	485
22	Chandigarh	6	2	33.3	0	0.0	1	16.7	1	16.7	1	16.7	1	16.7	3	3
23	Delhi	6	1	16.7	0	0.0	3	50.0	0	0.0	1	16.7	1	16.7	4	2
24	Puducherry	5	2	40.0	1	20.0	0	0.0	2	40.0	0	0.0	0	0.0	3	2
	Total	1924	326	16.9	202	10.5	424	22.0	451	23.4	252	13.1	269	14.0	952	972

State-wise Decadal Water Level Fluctuation with Mean [November (2012 to 2021)] and November 2022 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall						Rise	Fall
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%		
1	Andhra Pradesh	71	13	18.3	9	12.7	38	53.5	5	7.0	2	2.8	4	5.6	60	11
2	Assam	13	7	53.8	0	0.0	0	0.0	6	46.2	0	0.0	0	0.0	7	6
3	Bihar	8	1	12.5	0	0.0	1	12.5	5	62.5	1	12.5	0	0.0	2	6
4	Chhattisgarh	113	34	30.1	10	8.8	5	4.4	38	33.6	17	15.0	9	8.0	49	64
5	Goa	40	3	7.5	0	0.0	0	0.0	33	82.5	4	10.0	0	0.0	3	37
6	Gujarat	76	14	18.4	11	14.5	17	22.4	18	23.7	1	1.3	15	19.7	42	34
7	Haryana	64	15	23.4	7	10.9	1	1.6	13	20.3	13	20.3	15	23.4	23	41
8	Jharkhand	1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
9	Karnataka	195	41	21.0	17	8.7	109	55.9	23	11.8	3	1.5	2	1.0	167	28
10	Kerala	61	20	32.8	3	4.9	3	4.9	29	47.5	4	6.6	2	3.3	26	35
11	Madhya Pradesh	107	27	25.2	19	17.8	45	42.1	7	6.5	4	3.7	5	4.7	91	16
12	Maharashtra	31	11	35.5	4	12.9	14	45.2	2	6.5	0	0.0	0	0.0	29	2
13	Meghalaya	4	1	25.0	0	0.0	0	0.0	3	75.0	0	0.0	0	0.0	1	3
14	Nagaland	1	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
15	Odisha	47	25	53.2	1	2.1	0	0.0	12	25.5	6	12.8	3	6.4	26	21
16	Punjab	32	0	0.0	1	3.1	0	0.0	9	28.1	8	25.0	14	43.8	1	31
17	Tamil Nadu	250	47	18.8	43	17.2	120	48.0	24	9.6	8	3.2	8	3.2	210	40
18	Telangana	29	7	24.1	1	3.4	14	48.3	4	13.8	1	3.4	2	6.9	22	7
19	Tripura	5	1	20.0	0	0.0	0	0.0	4	80.0	0	0.0	0	0.0	1	4
20	Uttar Pradesh	5	2	40.0	0	0.0	0	0.0	2	40.0	1	20.0	0	0.0	2	3
21	Uttarakhand	4	2	50.0	0	0.0	1	25.0	1	25.0	0	0.0	0	0.0	3	1
22	West Bengal	587	63	10.7	19	3.2	16	2.7	265	45.1	133	22.7	91	15.5	98	489
23	Andaman and Nicobar	2	1	50.0	0	0.0	0	0.0	0	0.0	0	0.0	1	50.0	1	1
24	Chandigarh	5	1	20.0	1	20.0	1	20.0	1	20.0	0	0.0	1	20.0	3	2
25	Delhi	6	0	0.0	0	0.0	4	66.7	0	0.0	0	0.0	2	33.3	4	2
26	Puducherry	7	0	0.0	4	57.1	1	14.3	2	28.6	0	0.0	0	0.0	5	2
	Total	1764	337	19.1	151	8.6	390	22.1	506	28.7	206	11.7	174	9.9	878	886

State-wise Decadal Water Level Fluctuation with Mean [January (2013 to 2022)] and January 2023 in Deeper Aquifer

Sr. No.	State/UT Name	No of wells analysed	No. of wells in different depth range												Total No. of wells	
			Rise						Fall							
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%	Rise	Fall
1	Andhra Pradesh	75	13	17.3	16	21.3	37	49.3	4	5.3	0	0.0	5	6.7	66	9
2	Assam	13	8	61.5	0	0.0	0	0.0	4	30.8	1	7.7	0	0.0	8	5
3	Bihar	10	0	0.0	0	0.0	3	30.0	3	30.0	3	30.0	1	10.0	3	7
4	Chhattisgarh	101	36	35.6	7	6.9	10	9.9	24	23.8	13	12.9	11	10.9	53	48
5	Goa	39	3	7.7	1	2.6	0	0.0	34	87.2	1	2.6	0	0.0	4	35
6	Gujarat	85	22	25.9	9	10.6	17	20.0	16	18.8	7	8.2	14	16.5	48	37
7	Haryana	40	13	32.5	2	5.0	1	2.5	11	27.5	10	25.0	3	7.5	16	24
8	Jharkhand	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	0	1
9	Karnataka	193	33	17.1	18	9.3	85	44.0	42	21.8	8	4.1	7	3.6	136	57
10	Kerala	60	25	41.7	4	6.7	1	1.7	16	26.7	4	6.7	10	16.7	30	30
11	Madhya Pradesh	103	31	30.1	11	10.7	36	35.0	13	12.6	2	1.9	10	9.7	78	25
12	Maharashtra	33	9	27.3	3	9.1	12	36.4	6	18.2	1	3.0	2	6.1	24	9
13	Meghalaya	5	2	40.0	0	0.0	0	0.0	2	40.0	0	0.0	1	20.0	2	3
14	Nagaland	1	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0
15	Odisha	45	17	37.8	2	4.4	0	0.0	12	26.7	10	22.2	4	8.9	19	26
16	Punjab	30	1	3.3	0	0.0	0	0.0	6	20.0	9	30.0	14	46.7	1	29
17	Tamil Nadu	259	57	22.0	36	13.9	101	39.0	38	14.7	11	4.2	16	6.2	194	65
18	Telangana	334	28	8.4	23	6.9	54	16.2	55	16.5	62	18.6	112	33.5	105	229
19	Tripura	3	0	0.0	0	0.0	0	0.0	3	100.0	0	0.0	0	0.0	0	3
20	Uttar Pradesh	8	4	50.0	0	0.0	0	0.0	3	37.5	0	0.0	1	12.5	4	4
21	Uttarakhand	4	0	0.0	1	25.0	0	0.0	2	50.0	0	0.0	1	25.0	1	3
22	West Bengal	571	76	13.3	11	1.9	8	1.4	226	39.6	105	18.4	145	25.4	95	476
23	Chandigarh	7	2	28.6	0	0.0	1	14.3	2	28.6	0	0.0	2	28.6	3	4
24	Delhi	6	0	0.0	0	0.0	4	66.7	0	0.0	0	0.0	2	33.3	4	2
25	Puducherry	7	3	42.9	2	28.6	0	0.0	1	14.3	1	14.3	0	0.0	5	2
	Total	2033	383	18.8	147	7.2	370	18.2	523	25.7	248	12.2	362	17.8	900	1133

State-wise status of groundwater level, quality monitoring Stations as on March 2024

S. N.	State/UT	Groundwater Quality Monitoring Stations (numbers)
1	Andhra Pradesh	1473
2	Arunachal Pradesh	20
3	Assam	389
4	Bihar	796
5	Chhattisgarh	1041
6	Goa	72
7	Gujarat	632
8	Haryana	881
9	Himachal Pradesh	180
10	Jharkhand	460
11	Karnataka	1228
12	Kerala	364
13	Madhya Pradesh	1386
14	Maharashtra	1669
15	Manipur	4
16	Meghalaya	27
17	Mizoram	
18	Nagaland	94
19	Odisha	1718
20	Punjab	921
21	Rajasthan	630
22	Sikkim	
23	Tamil Nadu	1538
24	Telangana	974
25	Tripura	92
26	Uttar Pradesh	560
27	Uttarakhand	208
28	West Bengal	1206
	UTs	
1	Andaman & Nicobar	113
2	Chandigarh	8
3	Daman & Diu and Dadra & Nagar Haveli	17
4	Delhi	103
5	Jammu and Kashmir	287
6	Ladakh	
7	Puducherry	17
	Total	19468

Location	All India			
For the period	From	01/08/24	To	15/08/24
Date	20/08/24			
Issuing Office	CGWB, CHQ-Faridabad			

Para I

S. no.	Name of State	Total no. of samples analysed	No. of samples contaminated			Parameters of contamination
			Above Acceptable Limit	Above Permissible Limit	Total samples Contaminated	
1	Maharashtra	34	11	21	32	Electrical conductivity, Fluoride, Chloride, Nitrate, Sulphate, Calcium, Magnesium, Total Hardness
2	Kerala	69	11	8	19	pH, Electrical conductivity, Fluoride, Chloride, Nitrate, Calcium, Magnesium, Total Hardness
3	Bihar	64	11	52	63	Electrical conductivity, Fluoride, Chloride, Nitrate, Sulphate, Calcium, Magnesium, Total Hardness
4	Jharkhand	NIL	-	-	-	-
5	Meghalaya	18	1	7	8	pH, Nitrate, Manganese, Copper
6	Jammu and Kashmir	30	11	6	17	Chloride, Nitrate, Calcium, Magnesium, Total Hardness
7	Haryana	230	18	38	56	pH, Electrical conductivity, Fluoride, Chloride, Sulphate, Total Hardness, Chromium, Manganese, Iron, Copper, Arsenic, Selenium, Uranium
8	Punjab	257	11	104	115	pH, Electrical conductivity, Fluoride, Chloride, Nitrate, Sulphate, Total Hardness, Chromium, Manganese, Iron, Nickel, zinc, Copper, Arsenic, Lead, Uranium
9	Odisha	65	24	21	45	Electrical conductivity, Fluoride, Chloride, Nitrate, Sulphate, Calcium, Magnesium, Total Hardness
10	Andhra Pradesh	-	41	57	98	Electrical conductivity, Fluoride, Chloride, Nitrate, Calcium, Magnesium, Total Hardness
Total		767	139	314	453	

Samples were analyzed for basic parameters like pH, Electrical Conductivity, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Carbonate, Bicarbonate, Sulphate, Chloride, Nitrate & Fluoride in most of the states, and Heavy Metals were analyzed in Meghalaya, Haryana and Punjab, respectively. Table shows the number of samples showing anomalous values for different parameters as per BIS Drinking water Standard IS 10500 (2012). The detailed parameter-wise sample analysis is in the attached excel sheet.

The anomalies may be termed major in some case.

Risk perception for:

Manganese: Continue use can damage liver, lungs and kidneys, effects the metabolism of iron for formation of hemoglobin and leads to neurological conditions- impaired memory, impaired motor coordination and delayed reaction time- results in disease called Manganism.

Lead: Continue use can cause cardiovascular effects, increased blood pressure and incidence of hypertension. Decreased kidney function. Reproductive problems (in both men and women).

Iron: An excessive amount of exposure to iron can increase the risk of Parkinson's, cardiovascular disease, diabetes mellitus, pigmentation changes, Alzheimer's, as well as renal, liver, respiratory, and neurological issues

Arsenic: Arsenic in groundwater poses significant health risks, including skin lesions, cardiovascular disease, and several types of cancer due to long-term exposure. Chronic exposure to arsenic in groundwater can lead to serious health problems, including skin lesions, peripheral neuropathy, and an increased risk of several types of cancer, such as skin, lung, and bladder cancer. Long-term ingestion can cause cardiovascular disease, diabetes, and developmental disorders in children, potentially leading to cognitive and motor impairment.

Recommendation for Mitigation

Remedial Measures for pH

Treatment of acidic water:

- Passing through Neutralizing Filter containing Calcite, Magnesia (MgO) or Calcium Carbonate.
- Adding Soda Ash (Na_2CO_3)

Treatment of Basic water

- Installation of an Acid injector (white vinegar).

Remedial Measures for Nitrate

For removal of nitrate both non-treatment techniques like blending and treatment processes such as ion-exchange, reverse osmosis, biological denitrification and chemical reduction are useful.

a) Methods involving no treatment: In order to use any of these options the nitrate problem must be local-scale. Common methods are –

- Raw water source substitution
- Blending with low nitrate waters

This greatly reduces expenses and helps to provide safer drinking water to larger numbers of people.

b) Methods involving Treatment:

- Adsorption/Ion Exchange

- Reverse Osmosis
- Electrodialysis
- Bio-chemical Denitrification (By using denitrifying bacteria and microbes)
- Catalytic Reduction/Denitrification (using hydrogen gas)

Remedial Measures for Fluoride

- Adsorption and ion exchange
- Ion-Exchange resins
- Coagulation-precipitation
- Nalgonda Technique

Removal of Total Hardness, Calcium and Magnesium

- Chemical Process of Boiling Hard Water.
- Adding Slaked Lime (Clark's Process)
- Adding Washing Soda.
- Calgon Process.
- Ion Exchange Process.
- Using Ion Exchange Resins.

Carbonate (Temporary) Hardness also known as Ca Bicarbonate

Removal by Boiling or adding Lime

Non-Carbonate (Permanent) Hardness

Removal by Lime-soda, Zeolite or Demineralization Processes

Removal of Sulphate

- Reverse Osmosis (RO)
- Nano Filter (NF)
- Ion exchange
- Electrocoagulation
- Chemical precipitation
- Blending
- Rain Water Harvesting (RWH)
- Zero valent iron (ZVI) method

Specific Methods for Common Trace Metals

- **Manganese:** Treating the water at its source, filtration system and water treatment method.
- **Lead:** Reverse osmosis systems, water distillers and carbon filters.
- **Iron:** Oxygenation of groundwater followed by precipitation.
- **Arsenic:** Ion exchange, Chemical Precipitation.



GROUND WATER QUALITY IN SHALLOW AQUIFERS OF INDIA

CENTRAL GROUND WATER BOARD
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES
RIVER DEVELOPMENT AND GANGA REJUVENATION
GOVERNMENT OF INDIA
2023

REPORT ON

GROUND WATER QUALITY IN SHALLOW

AQUIFERS OF INDIA

Central Ground Water Board
Department of Water Resources, River Development and Ganga Rejuvenation
Ministry of Jal Shakti
Government of India
2023



देवश्री मुखर्जी
Debashree Mukherjee
सचिव
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सत्यमेव जयते



भारत सरकार
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 और गंगा संरक्षण विभाग
 GOVERNMENT OF INDIA
 MINISTRY OF JAL SHAKTI
 DEPARTMENT OF WATER RESOURCES,
 RIVER DEVELOPMENT & GANGA REJUVENATION



MESSAGE

In recent decades, groundwater has emerged as a cornerstone of India's agricultural and potable water security, with a significant portion of the nation's net irrigated area reliant on groundwater. India stands as the world's largest consumer of groundwater. However, the unsustainable exploitation of groundwater resources has led to over-extraction and a decline in its quality.

Globally, water pollution has emerged as a formidable challenge to the water security. Aquifers are being contaminated due to natural as well as anthropogenic sources. Monitoring of these contaminants is first step towards the sustainable management of these aquifers.

Numerous central and state government departments engaged in the water sector contribute to groundwater quality data generation through the collection and chemical analysis of water samples from diverse groundwater extraction structures across the country. The government's flagship initiative, the Jal Jeevan Mission, aimed at ensuring access to safe and potable drinking water in villages, has also facilitated the establishment of facilities for groundwater quality assessment to guarantee the provision of clean and contaminant-free drinking water.

The Central Ground Water Board plays a pivotal role in the routine monitoring of groundwater quality by analyzing water samples collected from its extensive network of quality monitoring stations each year. Various government initiatives have been implemented to formulate water quality monitoring and management plans, with quality assessments based on monitoring data aiding policymakers and water managers in strategic planning.

I commend the Central Ground Water Board for its exemplary publication, 'Ground Water Quality in Shallow Aquifers of India, 2023,' which offers comprehensive insights into nationwide chemical quality and reflects the prevalence of contaminants in groundwater. I am optimistic that this report will prove invaluable in addressing groundwater quality challenges and in the prudent management of this precious resource.

(Debashree Mukherjee)

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Government of India
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Department of Water Resources,
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Central Ground Water Board



FOREWORD

Water is a basic necessity for the survival of life. Even though India is blessed with large water resources, the ever-increasing growth of population, the steady rise in irrigation activities and rapid expansion of industries keep tremendous pressure on the available water resources. Water is available in two basic forms i.e., surface water and groundwater. Groundwater is at the core of sustainable development and is critical for socio-economic progress. Unlike many resources that are more static in nature, groundwater available for use and distribution can change drastically from year to year. Over the last few years much of the attention in groundwater has shifted from the problem of groundwater supply to considerations of groundwater quality.

Groundwater contamination recently has come to the attention of the public as incidents of contamination are being reported from every state. Central Ground Water Board for the last nearly six decades has been carrying out hydrogeological and hydrochemical investigations and has generated voluminous data. Central Ground Water Board monitors groundwater quality throughout the country on a regional scale, once a year during the month of May, from a network of monitoring stations, called "National Hydrograph Network Stations (NHNS)", which comprises open dug wells and piezometers. This report has been prepared based on the analytical results obtained from the water samples collected from these NHNS stations.

I am sure that this report will be of immense use to administrators, planners, academicians and other stakeholders in the field of groundwater quality management.

The sincere efforts made by Dr. S. K. Srivastava, Dr. K. Ravichandran, Dr. R. Dewangan, Dr. K. Radhapyari and Dr. Suresh Kumar in the compilation of data and preparation of this report in the present form are highly appreciable.

(Dr. Sunil Kumar Ambast)
Chairman

Faridabad

सुबोध यादव
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Subodh Yadav
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भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
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GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

MESSAGE

Groundwater is a vital resource, crucial for the socio-economic development of our nation. While it currently fulfills a significant portion of water demands across domestic, irrigation, and industrial sectors, its rapid exploitation and contamination are raising concerns among stakeholders and policymakers.

The contamination of groundwater can stem from natural geological processes or human activities, with the latter posing a growing threat to its quality. A considerable proportion of contemporary groundwater quality issues are attributed to urbanization, mining, industrial operations, and agricultural practices such as the use of fertilizers and pesticides. Additionally, unchecked extraction of groundwater may exacerbate salinity intrusion in coastal aquifers, particularly worrisome for countries boasting extensive coastlines.

In recent times, the focus on groundwater has shifted from mere supply concerns to encompassing quality considerations. Effectively managing groundwater quality presents a formidable challenge necessitating a systematic approach. Regular assessment of groundwater quality through chemical analysis of samples from diverse aquifers is indispensable for addressing quality-related challenges.

The Central Ground Water Board operates a network comprising approximately 17,000 quality monitoring stations nationwide, annually analyzing water samples. With 16 state-of-the-art chemical laboratories at its disposal, the Board consistently upgrades its facilities to detect emerging groundwater contaminants.

According to the present report, the number of districts experiencing salinity in groundwater has decreased from 198 in 2018 to 184 in 2022. However, the number of districts partially impacted by nitrate contamination has risen from 323 to 419, while fluoride contamination has increased from 212 districts to 392 during the same period.

I commend the Central Ground Water Board for producing the insightful and valuable report titled 'Ground Water Quality in Shallow Aquifers of India, 2022-23.' This comprehensive compilation of nationwide groundwater quality data will be helpful in informed policy decision making and adopting appropriate remedial measures by the stakeholders to tackle groundwater quality issues effectively.


(Subodh Yadav)




अनुराग खन्ना
सदस्य
Anurag Khanna
Member



भारत सरकार
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Central Ground Water Board



PREFACE

Groundwater is an important natural resource and is considered as a precious national asset. It is a major constituent of all living beings. The unplanned and accelerated development of this prime natural resource is creating concern among scientists, users, policymakers and other stakeholders.

The two main concerns are depleting resources volumetrically due to the depletion of water levels below ground and another major concern is quality of groundwater. Contamination of the Nation's groundwater resource has recently become an issue of widespread public concern. Water quality is one of the main challenges that societies will face during this century. This report contains compilation and statistical analysis of Water Quality Monitoring data observed at NHNS monitoring stations during the period April to May, 2022. The data has been interpreted to know the affected locations. The report attempts to briefly describe an overview and general conclusion based on the basis of water quality data of water samples. This report will provide knowledge about nationwide chemical quality and reflect the extent of contaminants occurring in groundwater.

We cannot afford to wait. We must put water at the heart of action plans. I am sure, this report would be useful in policy planning and implementation by Scientists, Academicians, NGOs and Individuals working in this sector. The findings of this report will pave ways to ensure the quality of this vital natural resource for sustainable and human development.

The efforts of Dr. S. K. Srivastava, Dr. K. Ravichandran, Dr. R. Dewangan, Dr. K. Radhapyari and Dr. Suresh Kumar are highly appreciable in the collection, compilation and synthesis of the data presented in the report.

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ANNEXURES

- i. Locations having Electrical conductivity > 3000 $\mu\text{S}/\text{cm}$ in ground water in different states/UT of India
- ii. Locations having Chloride > 1000 mg/litre in ground water in different states/UT of India
- iii. Locations having Fluoride > 1.5 mg/litre in ground water in different states/UT of India
- iv. Locations having Nitrate > 45 mg/litre in ground water in different states/UT of India
- v. Locations having Iron > 1.0 mg/litre in ground water in different states/UT of India
- vi. Location having Arsenic (>0.01 mg/Litre) in ground water in different states/UT of India
- vii. Location having Uranium >0.03 mg/L(>30ppb) in ground water in different states/UT of India.

1.0 INTRODUCTION

The quality of groundwater is a very sensitive issue. Groundwater is never pure and contains varying amounts of dissolved solids, the type and concentration depend on its source, surface and sub-surface environment, rate of groundwater movement, the residence time, the solubility of minerals present and the amount of dissolved carbon dioxide. In addition to the natural changes, anthropogenic activities such as sewage disposal, agricultural practices, industrial pollution etc. also contribute significantly to changes in groundwater quality. Once the contaminants have entered to the sub-surface geological environment, they may remain concealed for many years and may get dispersed over wide areas. Weathering of rock and mineral solubility controls the major ion composition of groundwaters. With increasing anthropogenic activities, a substantial amount of dissolved matter is added to groundwater. The ground water resources are being utilized for drinking, irrigation and industrial purposes. However, due to rapid growth of population, urbanization, industrialization and agriculture activities, ground water resources are under stress. There is growing concern on the deterioration of ground water quality due to geogenic and anthropogenic activities.

India is a vast country with varied hydrogeological situations resulting from diversified geological, climatological and topographic settings. Water-bearing rock formations (aquifers), range in age from Archaean to Recent. The natural chemical composition of ground water is influenced predominantly by type & depth of soils and subsurface geological formations through which ground water passes. Ground water quality is also influenced by contribution from the atmosphere and surface water bodies. Quality of ground water is also influenced by anthropogenic factors. For example, overexploitation of ground water in coastal regions may result in sea water ingress and consequent increase in salinity of ground water, excessive use of fertilizers and pesticides in agriculture and improper disposal of urban/industrial waste can cause contamination of ground water resources.

A diverse range of dissolved inorganic compounds present in different concentrations characterizes groundwater. These compounds originate from the chemical and biochemical interactions between water and geological substances. Inorganic impurities such as salinity, chloride, fluoride, nitrate, iron, and arsenic play a crucial role in assessing the suitability of groundwater for drinking purposes.

2.0 HYDROGEOLOGY

Behaviour of ground water in the Indian sub-continent is highly complicated due to the occurrence of diversified geological formations with considerable lithological and chronological variations, complex tectonic framework, climatological dissimilarities and various hydrochemical conditions. Broadly two groups of rock formations have been identified, on the basis of Ground Water hydraulics viz. Porous Formations and Fissured Formations.

2.1 POROUS FORMATIONS

Porous formations have been further subdivided into Unconsolidated and Semi – consolidated formations. The areas covered by alluvial sediments of river basins, coastal and deltaic tracts constitute the unconsolidated formations. These are by far the most significant ground water reservoirs for large scale and extensive development. The hydrogeological environment and ground water regime in the Indo-Ganga-Brahmaputra basin indicate the existence of potential aquifers having enormous fresh ground water resources.

The semi-consolidated formations occur mostly in narrow valleys or structurally faulted basins. The Gondwanas, Lathis, Tipams, Cuddalore sandstones and their equivalents are the most extensive productive aquifers. Under favourable situations, these formations give rise to free-flowing wells. In select tracts of northeastern India, these water-bearing formations are quite productive.

2.2 FISSURED FORMATIONS

The Fissured or consolidated formations occupy almost two-thirds of the country. Consolidated formations other than vesicular volcanic rocks have negligible primary porosity. From the hydrogeological point of view, fissured rocks are broadly classified into four types viz. Igneous and metamorphic rocks excluding volcanic and carbonate rocks, volcanic rocks, consolidated sedimentary rocks excluding carbonate rocks and Carbonate rocks.

- i) Igneous and metamorphic rocks excluding volcanic and carbonate rocks: -The most common rock types are granites, gneisses, charnockites, khondalites, quartzites, schists and associated phyllites, slates, etc. These rocks possess negligible primary porosity but attain porosity and permeability due to fracturing and weathering, which facilitates the yield from their rocks.
- ii) Volcanic rocks: -The predominant types of the volcanic rocks are the basaltic lava flows of Deccan Plateau. Water bearing properties of different flow units control ground water occurrence and movement in Deccan Traps. The Deccan Traps have usually poor to moderate permeabilities depending on the presence of primary and secondary pore spaces including vesicles/fractures.
- iii) Consolidated sedimentary rocks excluding carbonate rocks: Consolidated sedimentary rocks occur in Cuddapahs, Vindhyan and their equivalents. These formations consist of conglomerates, sandstones, shales, slates and quartzites. The presence of bedding planes, joints, contact zones and fractures controls the ground water occurrence, movement and yield potential of aquifers.
- iv) Carbonate rocks: - Limestones in the Cuddapah, Vindhyan and Bijawar groups of rocks dominates the carbonate rocks other than the marbles and dolomites. In carbonate rocks, the circulation of water creates solution cavities thereby increasing the permeability of the aquifers. Solution activity leads to widely contrasting permeability within short distances in such rocks.

3.0 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. At the same time, hydrochemistry has a potential use for tracing the origin and history of water. The hydrochemistry can also be of immense help in yielding information about the environment through which water has circulated. Hydrochemistry can be helpful in knowing about residence times, flow paths and aquifer characteristics as the chemical reactions are time and space dependent. 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_4 , NO_3 etc. Pollutants in the atmosphere can be transported 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 only slightly mineralized with specific electrical conductance (EC) generally below $50 \mu S/cm$, chloride 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

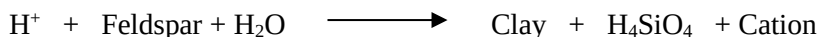
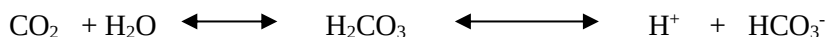
Surface water is found extremely variable in its chemical composition due to variations in relative contributions of ground water and surface water sources. The mineral content in river water usually bears an inverse relationship to discharge. The mineral content of river water tends to increase from 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 liter (meq/l). In case of cations, alkaline earths or normally calcium predominates but with increasing salinity the hydrochemical facies tends to change to mixed cations or even to Na- HCO_3 type.

3.3 CHEMISTRY OF GROUND WATER

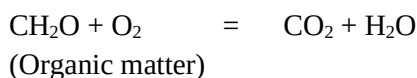
The downward percolating water is not inactive, and it is enriched in CO_2 . It can also act as a strong weathering agent apart from general solution effect. Consequently, the chemical composition of ground water will vary depending upon several factors like frequency of rain, which will leach out the 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.

4.0 WATER QUALITY CRITERIA

The available quality of groundwater is the resultant of all the processes and reactions, which taken place since the condensation of water in the atmosphere to the time it is retrieved in the form of groundwater from its source. The water has excellent capability to accumulate substances in soluble form as it moves over and into the land resource, from the biological processes and from human activities. Urbanization, agricultural development and discharges of municipal and industrial residues significantly alter characteristics of groundwater resource. The prevailing climatic conditions, topography, geological formations and use and abuse of this vital resource have significant effect on the characteristics of the water, because of which its quality varies with locations.

The definition of criteria and standards for water quality vary with the type of use. The characteristic of water required for human consumption, livestock, irrigation, industries etc., have different water quality requirements. The term water quality criteria may be defined as the “Scientific data evaluated to derive recommendations for characteristics of water for specific use”. The term standard applies to any definite rule, principle or measure established by any statutory Authority. The distinction between criteria and standards is important, as the two are neither interchangeable nor they become synonyms for the objective or goal. Realistic standards are dependent on criteria, designated uses and implementation as well as identification and monitoring procedure. The changes in all these factors may provide a basis for alteration in standards. In formulation of water quality criteria, the selection of water quality parameters depends on its use. Sayers, et. al. (1976 as quoted in CGWB & CPCB 2000) identified the key water quality parameters according to its various uses (**Table 4.0**).

Table 4.0: Water quality criteria parameters for various uses (Sayers et.al., 1976)

Public Water supply	Industrial Water supply	Agricultural water supply	Aquatic life & wild life water supply	Recreation and Aesthetics
Coliform bacteria Turbidity colour, Taste, Odour TDS, Cl, F, SO ₄ NO ₃ , CN, Trace Metals, Trace Organics Radioactive substances	Processing pH, Turbidity Colour, Alkalinity, Acidity, TDS, Suspended solids, Trace metals, Trace Organics Cooling PH, Temp, Silica, Al, Fe, Mg, Total hardness, Alkalinity / Acidity Suspended solids, Salinity	Farmstead Same as for public supply Live-stock Same as for public supply Irrigation TDS, EC, Na, Ca, Mg, K, B, Cl and Trace metals	Temp, DO, pH, Alkalinity, Acidity, TDS Salinity, pH, DCOs, Turbidity Colour, Settleable materials, Toxic substances, Nutrients, Floating materials	Recreations Tem, Turbidity, Colour, Odour, Floating Materials, Settable Materials Nutrients, Coliforms Aesthetics Same as for Recreation and Substances adversely affecting wild life

4.1 Water Quality Criteria for Drinking Purpose

With the objective of safeguarding water from degradation and to establish a basis for improvement in water quality, standards / guide lines / regulations have been laid down by various national and international organizations such as; Bureau of Indian Standards (BIS), World Health Organization (WHO), European Economic Community (EEC), Environmental Protection Agency (EPA), United States, and Inland Waters Directorate, Canada. The Bureau of Indian Standards (BIS) earlier known as Indian Standards Institutions (ISI) has laid down the standard specification for drinking water during 1983, which have been revised and updated from time to time. In order to enable the users, to exercise their discretion towards water quality criteria, the maximum permissible limit has been prescribed especially where no alternative sources are available. The national water quality standards describe essential and desirable characteristics required to be evaluated to assess suitability of water for drinking purposes. The important water quality characteristics as laid down in BIS standard (IS 10500: 2012) are summarized in **Table - 4.1**

Table 4.1: Drinking Water Characteristics (IS 10500: 2012)

S. No.	Parameters	Desirable Limits (mg/L)	Permissible limits (mg/L)
Essential Characteristics			
1	Colour Hazen Unit	5	15
2	Odour	Unobjectionable	-
3	Taste	Agreeable	-
4	Turbidity (NTU)	1	5
5	pH	6.5-8.5	No relaxation
6	Total Hardness, CaCO ₃	200	600
7	Iron (Fe)	1.0	No relaxation
8	Chloride (Cl)	250	1000
9	Residual Free Chlorine	0.2	1
10	Fluoride (F)	1.0	1.5
Desirable Characteristics			
11	Dissolved Solids	500	2000
12	Calcium (Ca)	75	200
13	Magnesium (Mg)	30	100
14	Copper (Cu)	0.05	1.5
15	Manganese (Mn)	0.1	0.3
16	Sulphate (SO ₄)	200	400
17	Nitrate (NO ₃)	45	No relaxation
18	Phenolic Compounds	0.001	0.002
19	Mercury (Hg)	0.001	No relaxation
20	Cadmium (Cd)	0.003	No relaxation
21	Selenium (Se)	0.01	No relaxation
22	Arsenic (As)	0.01	No relaxation
23	Cyanide (CN)	0.05	No relaxation
24	Lead (Pb)	0.01	No relaxation
25	Zinc (Zn)	5.0	15
26	Hexavalent Chromium	0.05	No relaxation

27	Alkalinity	200	600
28	Aluminum (Al)	0.03	0.2
29	Boron (B)	0.5	2.4
30	Pesticides	Absent	0.001
31	Uranium	0.03	No relaxation

NTU- Nephelometric Turbidity Unit.

N.B. The fluoride limits vary with average annual temperature of the areas. Similarly, the limits for magnesium are based on sulphate contents of water. When sulphate content is 250 mg/L or above, the magnesium should be between 30 and 50 mg/L but if sulphate is lower, higher content of magnesium is permissible.

4.2 Water Quality Criteria for Irrigation Purpose

Water quality plays a significant role in irrigated agriculture. Many problems originate due to inefficient management of water for agriculture use, especially when it carries high salt loads. The effect of total dissolved salts in irrigation water (measured in terms

of electrical conductance) on crop growth is extremely important. Soil water passes in to the plant through the root zone due to osmotic pressure and the plants root able to assimilate water and nutrients. Thus, the dissolved solid contents of the residual water in the root zone also have to be maintained within limits by proper leaching. These effects are visible in plants by their stunted growth, low yield, discoloration and even leaf burns at margin or top. The safe limits of electrical conductivity for crops of different degrees of salt tolerances under varying soil textures and drainage conditions are presented in **Table - 4.2**.

Table 4.2: Safe Limits for electrical conductivity for irrigation water (IS:11624-1986)

S. No.	Nature of soil	Crop Growth	Upper permissible safelimit of electrical conductivity in water $\mu\text{s/cm}$ at 25°C
1	Deep black soil and alluvial soil having clay content more than 30%; soils that are fairly to moderately well Drained	Semi-tolerant	1500
		Tolerant	2000
2	Textured soils having clay contents of 20-30%; soils that are well drained internally and have good surface drainage system	Semi-tolerant	2000
		Tolerant	4000
3	Medium textured soils having clay 10-20%; internally very well drained and having good surface drainage system	Semi-tolerant	4000
		Tolerant	6000

4	Light textured soils having clay less than 10%; soils that have excellent internal and surface drainage system.	Semi-tolerant	6000
		Tolerant	8000

In addition to problems caused by total amount of salts, some of the specific ions like sodium, boron and trace elements, if present in water in excess, also render it unsuitable for agricultural use.

4.2.1 SODIUM ADSORPTION RATIO (SAR) & RESIDUAL SODIUM CARBONATE (RSC)

The clay minerals in the soil adsorb divalent cations like calcium and magnesium ions from irrigation water. Whenever the exchange sites in clay are filled by divalent cations, the soil texture is conducive for plant growth. Sodium reacts with soil to reduce its permeability. In case the irrigation water is sodium dominant, the clay lattice is filled with sodium ions due to ion exchange. Such soils become impermeable and sticky and as such the cultivation becomes difficult to support plant growth. However, the cation exchange process is reversible and can be controlled either by adjusting the composition of water or by soil amendment by application of gypsum, which releases cations (Calcium) to occupy the exchange position. The tendency of water to replace adsorbed calcium and magnesium with sodium can be expressed by the Sodium Adsorption Ratio (SAR), where all the ion concentrations are in milli-equivalents per litre (meq/L).

$$SAR = \frac{Na}{\sqrt{(Ca + Mg)/2}}$$

When, water having high bicarbonates and low calcium and magnesium is used for irrigation purpose, precipitation of calcium and magnesium as carbonate takes place, changing the residual water to high sodium water with sodium bicarbonate in solution. It is termed as Residual Sodium Carbonate (RSC) which is expressed as;

$$RSC = (HCO_3 + CO_3) - (Ca + Mg)$$

(Where all the ions' concentrations are in milli equivalents / litre).

Percentage sodium (%Na):

Percentage sodium (%Na) is an indication of the soluble sodium content of the groundwater and also used to evaluate Na hazard. In all natural waters, %Na is a common parameter to assess its suitability for irrigation purposes since sodium reacts with the soil to reduce permeability.

$$\%Na = \frac{(Na + K)}{(Ca + Mg + Na + K)} * 100$$

The quality of water is commonly expressed by classes of relative suitability for irrigation with reference to salinity levels. The recommended classification with respect to Electrical Conductivity, Sodium content, Sodium Adsorption Ratio, and Residual Sodium Carbonate, under customary irrigation conditions has been depicted in **Table - 4.2.1.**

Table 4.2.1: Guidelines for evaluation of quality of irrigation water

Water Class	Alkalinity hazards		
	SAR IS:11624-1986	RSC (meq/L) IS:11624-1986	%Na Wilcox
Low	< 10	< 1.5	< 20
Medium	>10 – 18	1.5 – 3	20 - 60
High	>18 – 26	3 - 6	> 60
Very High	> 26	> 6	

4.3 Effects Of Water Quality Parameters on Human Health and Distribution for Various Users

It is essential to ensure that various constituents are within prescribed limits in drinking water supplies to avoid impact on human health (**Table – 4.2.3**). Man, life forms and domestic animals are affected by alteration in water quality due to natural or anthropogenic reasons. The effect of these substances depends on the quantity of water consumed per day and their concentration in water.

Table 4.2.3: Effects of water quality parameters on human health when used for drinking Purpose

S. No.	Parameters	Prescribed limits IS:10500, 2012		Probable Effects
		Desirable Limit	Permissible Limit	
1	Colour (Hazen unit)	5	15	Makes water aesthetically undesirable
2	Odour	Essentially free from objectionable odour		Makes water aesthetically undesirable
3	Taste	Agreeable		Makes water aesthetically undesirable
4	Turbidity (NTU)	1	5	High turbidity indicates contamination / Pollution.
5	pH	6.5	8.5	Indicative of acidic or alkaline waters, affects taste, corrosivity and the water supply system
6	Hardness as CaCO ₃ (mg/L)	200	600	Affects water supply system (Scaling), Excessive soap consumption, and calcification of arteries. There is no conclusive proof but it may cause urinary concretions, diseases of kidney or bladder and stomach disorder.
7	Iron (mg/L)	1.0	No relaxation	Gives bitter sweet astringent taste, causes staining of laundry and porcelain. In traces it is essential for nutrition.

S. No.	Parameters	Prescribed limits IS:10500, 2012		Probable Effects
		Desirable Limit	Permissible Limit	
8	Chloride (mg/L)	250	1000	May be injurious to some people suffering from diseases of heart or kidneys. Taste, indigestion, corrosion and palatability are affected.
9	Residual Chlorine (mg/L) Only when water is Chlorinated	0.20	-	Excessive chlorination of drinking water may cause asthma, colitis and eczema.
10	Total Dissolved Solids-TDS (mg/L)	500	2000	Palatability decreases and may cause gastro intestinal irritation in human, may have laxative effect particularly upon transits and corrosion, may damage water system.
11	Calcium (Ca) (mg/L)	75	200	Causes encrustation in water supply system. While in sufficiency causes a severe type of rickets, excess causes concretions in the body such as kidney or bladder stones and irritation in urinary passages.
12	Magnesium (mg) (mg/L)	30	100	Its salts are cathartics and diuretic. High concentration may have laxative effect particularly on new users. Magnesium deficiency is associated with structural and functional changes. It is essential as an activator of many enzyme systems.
13	Copper (Cu) (mg/L)	0.5	1.50	Astringent taste but essential and beneficial element in human metabolism. Deficiency results in nutritional anemia in infants. Large amount may result in liver damage, cause central nervous system irritation and depression. In water supply it enhance corrosion of aluminum in particular
14	Sulphate (SO ₄) (mg/L)	200	400	Causes gastro intestinal irritation along with Mg or Na, can have a cathartic effect on users, concentration more than 750 mg/L may have laxative effect along with Magnesium.
15	Nitrate (NO ₃) (mg/L)	45	No relaxation	Cause infant methaemoglobinaemia (blue babies) at very high concentration, causes gastric cancer and affects adversely central nervous system and cardiovascular system.
16	Fluoride (F) (mg/L)	1.0	1.50	Reduce dental carries, very high concentration may cause crippling skeletal fluorosis.
17	Cadmium (Cd) (mg/L)	0.003	No relaxation	Acute toxicity may be associated with renal, arterial hypertension, itai-itai disease, (a bone disease). Cadmium salt causes cramps, nausea, vomiting and diarrhea.
18	Lead (Pb) (mg/L)	0.01	No relaxation	Toxic in both acute and chronic exposures. Burning in the mouth, severe inflammation of the gastro-intestinal tract with vomiting and diarrhoea, chronic toxicity produces nausea, severe abdominal pain, paralysis, mental confusion, visual disturbances, anaemia etc.
19	Zinc (Zn) (mg/L)			An essential and beneficial element in human metabolism. Taste threshold for Zn occurs at

S. No.	Parameters	Prescribed limits IS:10500, 2012		Probable Effects
		Desirable Limit	Permissible Limit	
		5	15	about 5 mg/L imparts astringent taste to water.
20	Chromium (Cr ⁶) (mg/L)	0.05	No relaxation	Hexavalent state of Chromium produces lung tumors can produce cutaneous and nasal mucous membrane ulcers and dermatitis.
21	Boron (B) (mg/L)	0.5	2.4	Affects central nervous system its salt may cause nausea, cramps, convulsions, coma etc.
22	Alkalinity (mg/L) as CaCO ₃	200	600	Impart distinctly unpleasant taste may be deleterious to human being in presence of high pH, hardness and total dissolved solids.
23	Pesticides: (mg/l)	Absent	0.001	Imparts toxicity and accumulated in different organs of human body affecting immune and nervous systems may be carcinogenic.
24	Phosphate (PO ₄) (mg/L)	No guideline		High concentration may cause vomiting and diarrhea, stimulate secondary hyperthyroidism and bone loss
25	Sodium (Na) (mg/L)	No guidelines		Harmful to persons suffering from cardiac, renal and circulatory diseases.
26	Potassium (K) (mg/L)	No guidelines		An essential nutritional element but its excessive amounts is cathartic
27	Silica (SiO ₂) (mg/L)	No guidelines		-
28	Nickel (Ni) (mg/L)	0.02		Non-toxic element but may be carcinogenic in animals, can react with DNA resulting in DNA damage in animals.
29	Pathogens (a) Total coliform (per 100ml) (b) Faecal Coliform (per 100ml)	nil		Cause water borne diseases like coliform Jaundice, Typhoid, Cholera etc. produce infections involving skin mucous membrane of eyes, ears and throat.
30	Arsenic	0.01	No relaxation	Various skin diseases, Carcinogenic
31	Uranium	0.03	No relaxation	Kidney disease, Carcinogenic

5.0 GROUND WATER QUALITY MONITORING

The International Standard Organization (ISO) has defined monitoring as, "The programmed process of samplings, measurements and subsequent recording or signaling or both, of various water characteristics, often with the aim of assessing, conformity to specified objectives". A systematic plan for conducting water quality monitoring is called Monitoring Programme, which includes monitoring network design, preliminary survey, resource estimation, sampling, analysis, data management & reporting.

Monitoring of ground water quality is an effort to obtain information on chemical quality through representative sampling in different hydrogeological units. Ground Water is commonly tapped from phreatic aquifers through dugwells in a major part of the country and through springs and hand pumps in hilly areas. The main objective of ground water quality monitoring programme is to get information on the distribution of water quality on a regional scale as well as lattice is to create a background data bank of different chemical constituents in ground water.

One of the main objectives of the ground water quality monitoring is to assess the suitability of ground water for drinking purpose. The quality of drinking water is a powerful environmental determinant of the health of a community. The problem of the quality of water resources in general, and groundwater resources in particular, is becoming increasingly important in both industrialized and developing nation. In developing countries like India, the essential concerns as regards water resources are their quantity, availability, sustainability and suitability. Groundwater plays a leading role because it has of fundamental importance to all living beings.

Even though water is the most frequently occurring substance on earth, lack of safe drinking water is more prominent in the developing countries. Due to increasing world population, extraction of groundwater is also increasing for irrigations, industries, municipalities and urban and rural households' day by day. During dry season extensive withdrawal of groundwater for irrigation purpose is lowering the water table in the aquifer and also changing the chemical composition of water.

The physical and chemical quality of ground water is important in deciding its suitability for drinking purposes. Bureau of Indian Standards (BIS) formally known as Indian Standard Institute (ISI) vide its document IS: 10500:2012, Edition 3.2 (2012-15) has recommended the quality standards for drinking water. On this basis of classification, the natural ground water of India has been categorized as desirable, permissible and unfit for human consumption.

From the analytical results, it is seen that majority of water samples collected from observation / monitoring wells of CGWB in a major part of the country fall under desirable or permissible category and hence are suitable for drinking purposes. However, a small percentage of well waters are found to have concentrations of some constituents beyond the permissible limits. Such waters are not fit for human consumption and are likely to be harmful to health on continuous use.

5.1 Data Validation / Data Quality Control

Groundwater quality data validation is an essential step in ensuring the reliability and accuracy of the data. Here are some of the main steps for groundwater quality data validation.

- a. **Checking of Data Consistency:** Checking of the data for consistency by comparing the measurements of a particular parameter over time. This will help identify any changes in the groundwater quality due to measurement methodology or equipment
- b. **Checking the correlation between EC and TDS:**
 - a. The relationship between the two parameters is often described by a constant (commonly between 0.55 and 0.95 for freshwaters).
 - b. Thus: $TDS\ (mg/l) \sim (0.55\ to\ 0.95) \times EC\ (mS/cm)$.
 - c. The value of the constant varies according to the chemical composition of the water. For freshwaters, the normal range of TDS can be calculated from the following relationship:
 - d. $0.55\ conductivity\ (mS/cm) < TDS\ (mg/l) < 0.95\ conductivity\ (mS/cm)$.
 - e. Typically the constant is high for chloride rich waters and low for sulphate rich waters.

c. **Checking the cation-anion balance**

When a water quality sample has been analysed for the major ionic species, one of the most important validation tests can be conducted: the cation-anion balance.

$$\text{Sum of cations} = \text{sum of anions}$$

where:

cations = positively charged species in solution (meq/l)

anions = negatively charged species in solution (meq/l)

The Electronic charge balance is expressed as follows:

$$\text{Electronic Charge Balance (ECB \%)} = \frac{[\sum \text{ cations} - \sum \text{ anions}]}{[\sum \text{ cations} + \sum \text{ anions}]} \times 100$$

All concentrations should be in epm. Error charge balance has been computed for the chemical results of 2022-23 and analysis showing more than 10% ECB has not been accepted as it indicates that there has been an error made in at least one of the major cation/anion analyses.

6.0 GROUND WATER QUALITY SCENARIO IN INDIA

The quality of groundwater in India has been evaluated by sampling and analysis of water samples collected from Groundwater Monitoring wells. About **15507** Groundwater Monitoring wells were monitored for water quality during May 2022 representing pre-monsoon water quality. The state-wise chemical analysis data of the samples are given in the Annexure - IX. The summarized results of groundwater quality ranges are given in **Table - 6.1**.

Table - 6.1. Summarized results of groundwater quality ranges, (May 2022)

S. No	Parameters		Range	No. of sample	Percentage
1	Electrical Conductivity $\mu\text{S}/\text{cm}$ at 25°C	Fresh	< 750	6971	44.95
		Moderate	750- 2250	6780	43.72
		Slightly mineralized	2251- 3000	819	5.28
		Highly mineralized	> 3000	937	6.04
2	Chloride mg/L	Desirable limit	< 250	13130	84.67
		Permissible limit	251-1000	2026	13.06
		Beyond permissible limit	> 1000	351	2.26
3	Fluoride mg/L	Desirable limit	< 1.0	12951	83.51
		Permissible limit	1.0 - 1.5	1508	9.72
		Beyond permissible limit	>1.5	1048	6.75
4	Nitrate mg/L	Permissible limit	< 45	12159	78.41
		Beyond permissible limit	> 45	3348	21.59

The groundwater samples collected from dug wells and hand pumps tapping phreatic aquifers are analyzed for all the major inorganic parameters. Based on the results, it is found that ground water of the country is mostly of calcium bicarbonate (Ca-HCO_3) type when the total dissolved solids of water is below 500 mg/L (corresponding to electrical conductance of 750 $\mu\text{S}/\text{cm}$ at 25°C). They are of mixed cations and mixed anion type when the electrical conductance is between 750 and 3000 $\mu\text{S}/\text{cm}$ and waters with electrical conductance above 3000 $\mu\text{S}/\text{cm}$ are of sodium chloride (Na-Cl) type. However, other types of water are also found among these general classifications, which may be due to the local variations in hydro-chemical environments due to anthropogenic activities. Nevertheless, occurrence of high concentrations of some water quality parameters such as salinity, chloride, fluoride, iron, arsenic and nitrate have been observed in some pockets in few states of the country.

7.0 GROUND WATER QUALITY HOT SPOTS IN UNCONFINED AQUIFERS OF INDIA

Unconfined aquifers are extensively tapped for water supply across the country therefore; its quality is of paramount importance. The chemical parameters like TDS, Chloride, Fluoride, Iron, Arsenic and Nitrate etc are main constituents defining the quality of ground water in unconfined aquifers. Therefore, presence of these parameters in ground water beyond the permissible limit in the absence of alternate source has been considered as groundwater quality hotspots.

Groundwater quality hot spot maps of the country have been prepared depicting six main parameters based on their distribution shown on the separate maps. These maps depict the spatial distribution of the following constituents in ground water tapping the unconfined aquifers.

- I. Electrical Conductivity
- II. Chloride (> 1000 mg/L)
- III. Fluoride (>1.5 mg/L)
- IV. Nitrate (>45mg/L)
- V. Iron (>1.0mg/L)
- VI. Arsenic (>0.01 mg/L)
- VII. Uranium (>0.03 mg/L)
- VIII. Total Hardness (>600 mg/L)

7.1 Electrical Conductivity

Conductivity measurements are used routinely in many industrial and environmental applications as a fast, inexpensive and reliable way of measuring the ionic content in a solution. For example, the measurement of product conductivity is a typical way to monitor and continuously trend the performance of water purification systems. In many cases, conductivity is linked directly to the total dissolved solids (TDS).

Salinity is the saltiness or dissolved salt contents of a water body. Salt content is an important factor in water use. Salinity can be technically defined as the total mass in grams of all the dissolved substances per Kilogram of water. Different substances dissolve in water giving it taste and odour. In fact, humans and other animals have developed senses which are, to a degree, able to evaluate the potability of water, avoiding water that is too salty or putrid.

Salinity always exists in ground water but in variable amounts. It is mostly influenced by aquifer material, solubility of minerals, duration of contact and factors such as the permeability of soil, drainage facilities, and quantity of rainfall and above all, the climate of the area. The salinity of groundwater in coastal areas in addition to the above may be due to air borne salts originating from air water interface over the sea and also due to over pumping of fresh water which overlays saline water in coastal aquifer systems.

BIS has recommended a drinking water standard for total dissolved solids a limit of 500 mg/L (corresponding to EC of about 750 $\mu\text{S}/\text{cm}$ at 25°C) that can be extended to a TDS of 2000 mg/L

(corresponding to EC of about 3000 $\mu\text{S}/\text{cm}$ at 25°C) in case of no alternate source. Water having TDS more than 2000 mg/L is not suitable for drinking purpose. In Fig 7.1.1, the EC values (in $\mu\text{S}/\text{cm}$ at 25°C) of ground water from observation/monitoring wells have been used to show distribution patterns of electrical conductivity in different ranges of suitability for drinking purposes. It is apparent from the map that majority of the waters having EC values less than 750 $\mu\text{S}/\text{cm}$ at 25°C occur mostly in the states of J & K, Himachal Pradesh, Uttarakhand, N-Uttar Pradesh, Kerala, Sikkim, Chhattisgarh, Orissa, Western Ghats of Maharashtra & Karnataka and North- Eastern states such as Asam, Meghalaya, Arunachal Pradesh, Tripura etc., of the country.

Groundwater with EC ranging between 750 and 3000 $\mu\text{S}/\text{cm}$ at 25°C falling under ‘permissible’ range are confined mainly to parts of Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Jharkhand and Punjab. However, in some cases, relatively high values of EC in excess of 3000 $\mu\text{S}/\text{cm}$ are observed in many parts of the country. Especially in Rajasthan, Gujarat, Haryana, Andhra Pradesh, Maharashtra, Tamil Nadu, Karnataka etc. Table 7.1.1 shows the list of districts affected by high EC water (EC > 3000 $\mu\text{S}/\text{cm}$) and these areas are water quality hot spots from salinity point of view.

State-wise percentage of wells having EC >3000 $\mu\text{S}/\text{cm}$ is shown as a bar diagram in Fig 7.1.1 and the occurrences of Electrical Conductivity in ground water beyond permissible limit (>3000 $\mu\text{S}/\text{cm}$) have been shown on the contour map as Fig 7.1.2, the percentage groundwater samples in various EC range is also illustrated in Fig 7.1.3. locations details are given in Annexure-I.

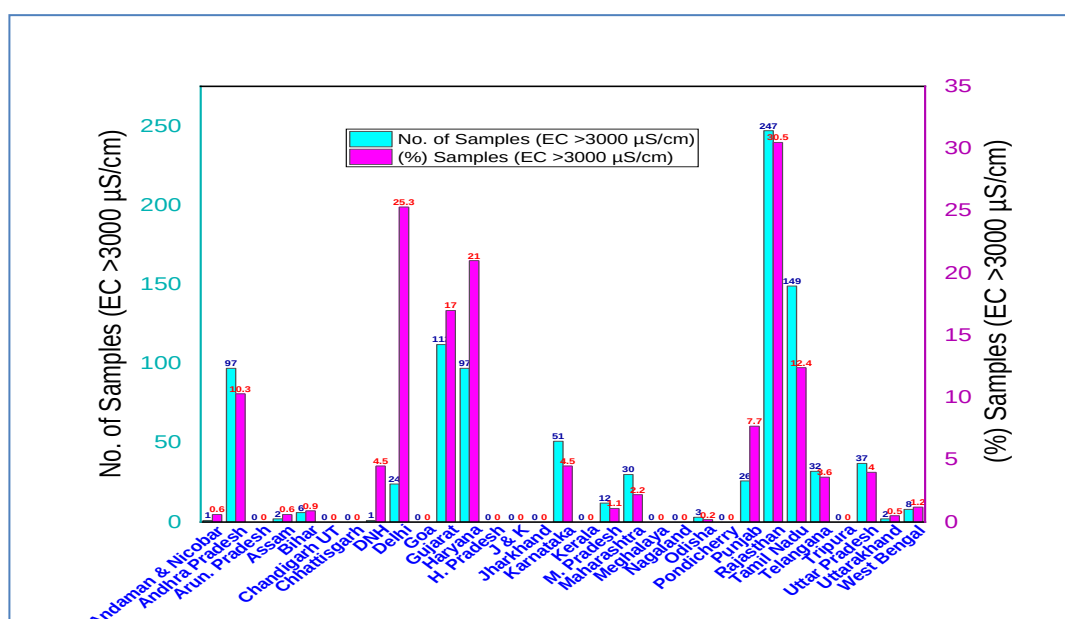


Fig 7.1.1 State-wise percentage of wells having EC >3000 $\mu\text{S}/\text{cm}$.

Table 7.1.1 State-wise percentage of samples having EC >3000 $\mu\text{S}/\text{cm}$

Sr. No	State and UT	No. of Samples collected (NHS 2022-23)	No. of Samples (EC >3000 μ S/cm)	(%) Samples (EC >3000 μ S/cm)
1	A & N Islands	110	1	0.9
2	Andhra Pradesh	940	97	10.3
3	Arunachal Pradesh	18	0	0.0
4	Assam	319	2	0.6
5	Bihar	661	6	0.9
6	Chandigarh UT	1	0	0.0
7	Chhattisgarh	801	0	0.0
8	Dadra and Nagar Haveli and Daman & Diu	22	1	4.5
9	Delhi	95	24	25.3
10	Goa	63	0	0.0
11	Gujarat	657	112	17.0
12	Haryana	463	97	21.0
13	Himachal Pradesh	160	0	0.0
14	Jammu & Kashmir	250	0	0.0
15	Jharkhand	392	0	0.0
16	Karnataka	1141	51	4.5
17	Kerala	265	0	0.0
18	Madhya Pradesh	1136	12	1.1
19	Maharashtra	1358	30	2.2
20	Meghalaya	65	0	0.0
21	Nagaland	15	0	0.0
22	Odisha	1274	3	0.2
23	Pondicherry	16	0	0.0
24	Punjab	338	26	7.7
25	Rajasthan	809	247	30.5
26	Tamil Nadu	1197	149	12.4
27	Telangana	890	32	3.6
28	Tripura	67	0	0.0
29	Uttar Pradesh	917	37	4.0
30	Uttarakhand	396	2	0.5
31	West Bengal	670	8	1.2
	Total (India)	15507	937	6.04

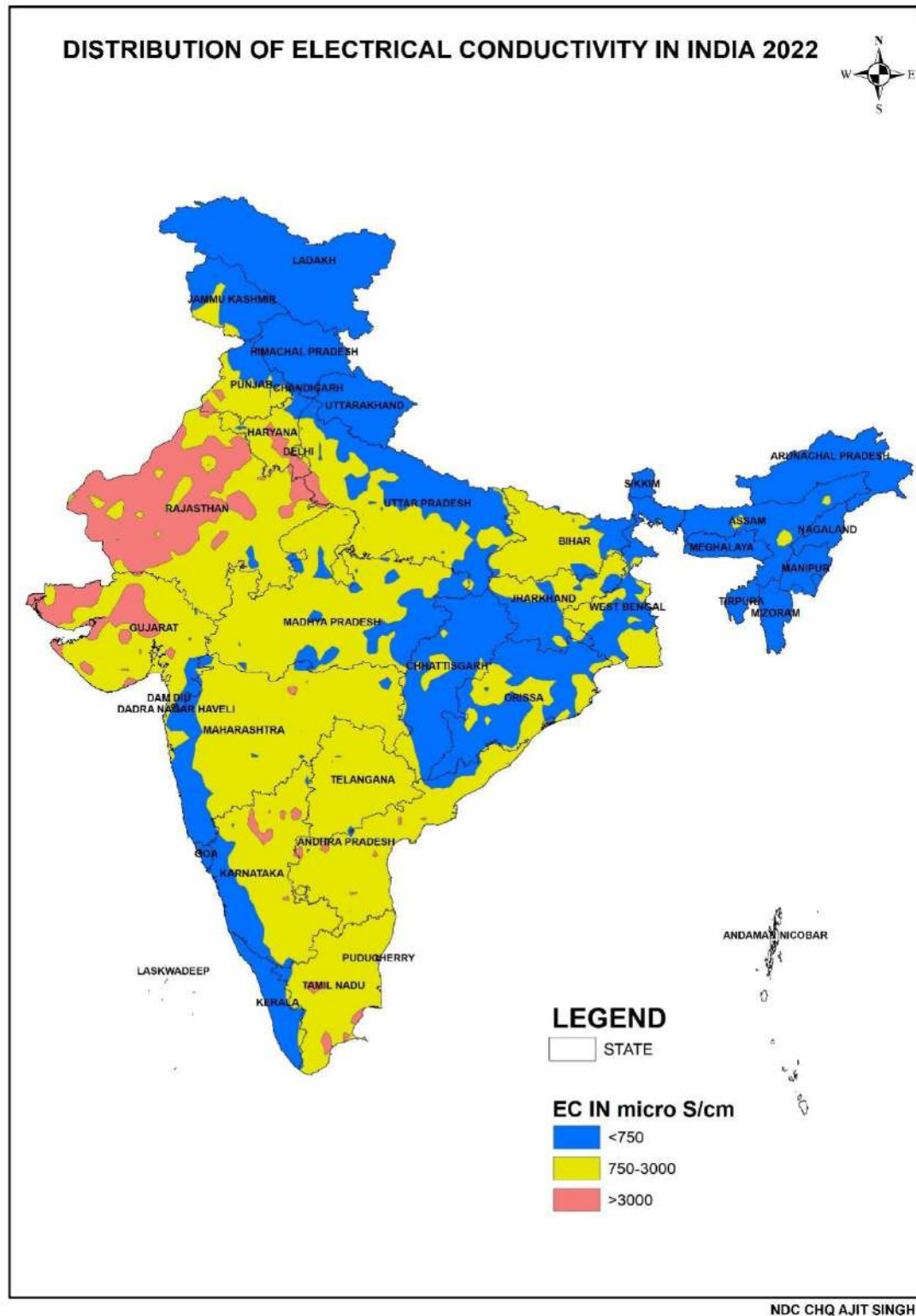


Fig 7.1.2 Spatial distribution of Electrical Conductivity during May 2022.

% groundwater samples in various EC range

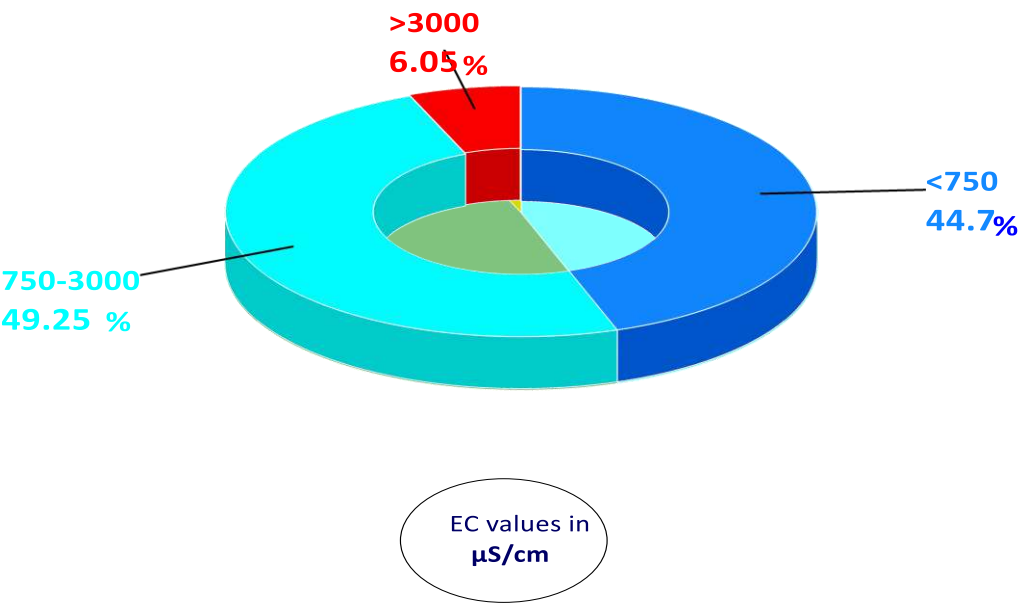


Fig 7.1.3 Percentage groundwater samples in various EC range (India).

Table 7.1.2: Districts Affected by Salinity (High EC) in Groundwater in Different States of India.

S. No.	State	Parts of districts having EC > 3000 μS/cm.
1.	Andaman and Nicobar	South Andaman
2.	Andhra Pradesh	Anantpur, Chittur, East Godavari, Guntur, Kadapa, Krishna Kurnool, Nellore, Srikakulam, Prakasam, Vijayanagram, Visakhapatnam, West Godavari
3.	Bihar	East Champaran, Jehanabad, Nalanda, Samastipur
4.	Dadra and Nagar Haveli and Daman & Diu	Diu
5.	Delhi	New Delhi, North, North West, South West, West Delhi
6.	Gujarat	Ahmedabad, Amreli, Anand, Arvalli, Banas Kantha, Bharuch, Bhavnagar, Botad, Chhota Udaipur, Devbhumi Dwarka, Gir Somnath, Jamnagar, Junagadh, Kachchh, Kheda, Mahesana, Morbi, Navsari, Patan, Porbandar, Rajkot, Sabarkantha, Surendra Nagar, Vadodara, Valsad
7.	Haryana	Bhiwani, Faridabad, Fatehabad, Gurgaon, Hisar, Jhajjar Jind, Kaithal, Karnal, Mahendragarh, Mewat, Palwal, Panipat, Rewari, Rohtak, Sirsa, Sonipat.
8.	Karnataka	Bagalkot, Belgaum, Bellari, Bijapur, Chikmagaluru, Chitradurga, Hassan, Kolar, Koppal, Raichur, Tumkur, Vijayanagara, Yadgir

S. No.	State	Parts of districts having EC > 3000 $\mu\text{S/cm}$.
9.	Madhya Pradesh	Bhind, Dhar, Gwalior, Indore, Neemuch, Shivpuri, Ujjain,
10.	Maharashtra	Ahmednagar, Akola, Amravati, Aurangabad, Beed, Buldhana, Chandrapur, Dhule, Jalna, Nagpur, Nashik, Parbhani, Sangli, Solapur, Wardha.
11.	Orissa	Ganjam, Khordha
12.	Punjab	Bathinda, Faridkot, Fazilka, Mansa, Muktsar, Sas Nagar
13.	Rajasthan	Ajmer, Alwar, Banswara, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittaurgarh, Churu, Dausa, Dhaulpur, Ganganagar, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhunjhunu, Jodhpur, Karauli, Nagaur, Pali, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk, Udaipur
14.	Tamil Nadu	Chennai, Coimbatore, Dharmapuri, Dindigul, Erode, Kancheepuram, Karur, Krishnagiri, Madurai, Nagapattinam, Namakkal, Perambalur, Pudukkottai, Ramanathapuram, Salem, Sivaganga, Theni, Thiruvannamalai, Tirunelveli, Tiruppur, Tiruvallur, Trichy, Tuticorin, Vellore, Villupuram, Virudhunagar.
15.	Telangana	Khamam, Mahbubnagar, Medak, Nalgonda, Nizamabad, Warangal
16.	Uttar Pradesh	Agra, Aligarh, Etah, Fatehpur, Firozabad, Gautam Buddha Nagar, Hamirpur, Hathras, Mahamaya Nagar, Mathura, Unnao
17.	Uttarakhand	Dehradun
18.	West Bengal	Howrah, Purulia, South 24 Parganas

Table 7.1.3: Comparative change in number of districts having EC > 3000 $\mu\text{S/cm}$ in various states.

S. No.	State	Nos. of districts having EC > 3000 $\mu\text{S/cm}$.		
		2015	2022	Increase/Decrease
1.	Andhra Pradesh	12	13	1
2.	Bihar	02	04	2
3.	Chattisgarh	01	00	-1
4.	Delhi	06	05	-1
5.	Gujarat	21	27	6
6.	Haryana	09	17	8
7.	Himachal Pradesh	00	00	0
8.	Jharkhand	01	00	-1
9.	Karnataka	11	13	2
10.	Kerala	00	00	0
11.	Maharashtra	17	15	-2
12.	Madhya Pradesh	08	07	-1
13.	Orissa	07	02	-5
14.	Punjab	06	06	0
15.	Rajasthan	29	28	-1
16.	Tamil Nadu	14	26	12
17.	Telangana	06	06	0
18.	Uttar Pradesh	10	11	1
19.	Uttarakhand	00	01	1
20.	West Bengal	06	03	-3
	Total	166	184	18

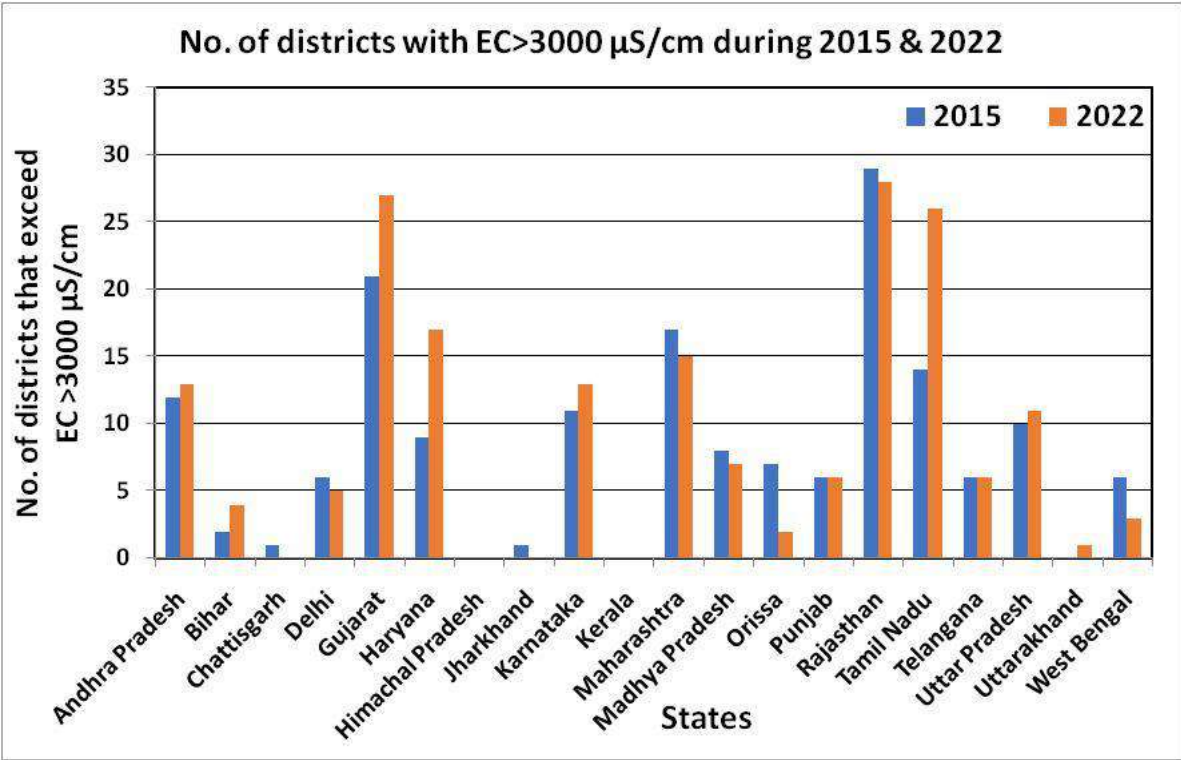


Fig. 7.1.4 Comparison on No of districts exceed EC >3000 μ S/cm during 2015 and 2022.

In comparison to 2015 (Table 7.1.3), it has been observed that the no. of districts having EC more than 3000 μ S/cm in various States has increased in 2022 by 9.03 %. In Bihar, Gujarat, Haryana, Karnataka, Tamilnadu and Uttar Pradesh States has the increase in the no. of district is a matter of concern. However, in some States it has decreased also, which may be because of dilution in that particular area.

7.1.1 TREND ON ELECTRICAL CONDUCTIVITY

Trend analysis determines whether the measured values of the water quality variables increase or decrease during a time period. The Electrical Conductivity (EC) of groundwater is contributed by all the dissolved ionic constituents. Therefore, it is a measure of the total ionic content of the water. It could be used as a source of inorganic pollution indicator as most of the inorganic compounds are present as ions in water. Hence, EC was taken to assess the trend of ground water quality in India. The number of wells monitored in the year 2020 and 2021 is comparatively less due to COVID pandemic situation. The percentage of well exceeds the electrical conductivity more than 3000 μ S/cm for the period of 2017 to 2022 were compared and presented in the Table7.1.4 and Fig 7.1.2 and observed that the percentage of samples exceed the permissible limit of 3000 μ S/cm were ranging between 5 - 7 % and no significant trend was noticed. Trend on water quality for Electrical conductivity (EC) prepared for the state of Tamil Nadu is showing a slightly decreasing trend (Fig. 7.1.5 & 7.1.5a).

Trend on Electrical Conductivity in a district, Virudhunagar of Tamil Nadu shows (Fig 7.1.6) an increasing trend due to lowest rain fall recorded district in the state of Tamil Nadu. Trend on Electrical Conductivity in a district, Tiruvallur of Tamil Nadu shows (Fig. 7.1.7) a decreasing

trend as a dilution factor due to the effect of implementation of mandatory rain water harvesting structure.

Table 7.1.4: Percentage of wells Exceed EC>3000 $\mu\text{S}/\text{cm}$ during the period of 2017-2022

Year	Total Number of samples analysed	No. of districts affected by EC	Total No of locations affected by EC	% of locations affected by EC (EC>3000 $\mu\text{S}/\text{cm}$)
2017	13200	198	720	5.45
2018	13247	198	825	6.23
2019	12503	172	832	6.65
2020	6582	90	416	6.32
2021	8427	119	544	6.46
2022	15507	184	937	6.04

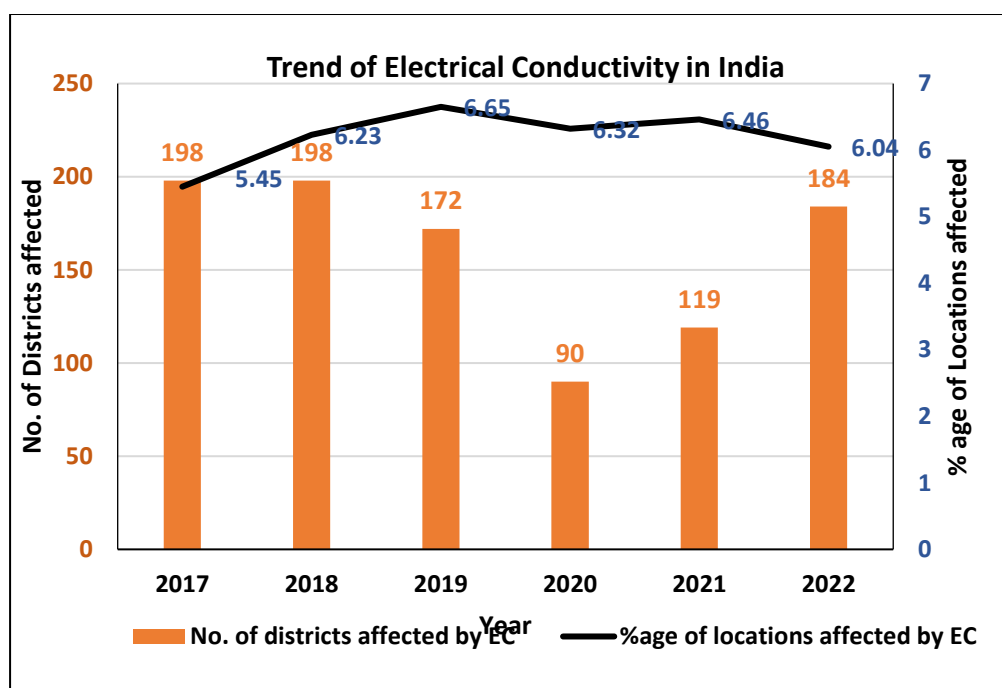


Fig. 7.1.5 Trend of Electrical Conductivity in India

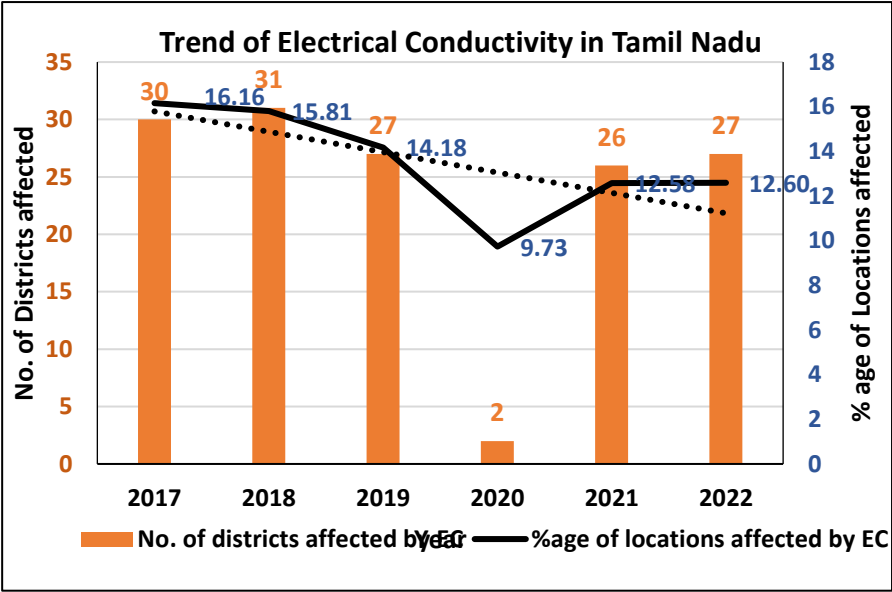


Fig. 7.1.5a Trend of Electrical Conductivity in Tamil Nadu

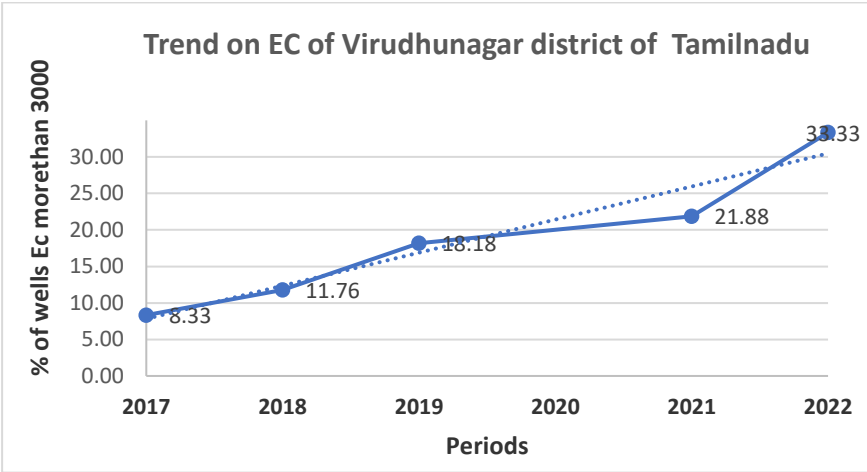


Fig. 7.1.6 Trend on Electrical Conductivity in a district (Virudhunagar) for the period of 2017-2022

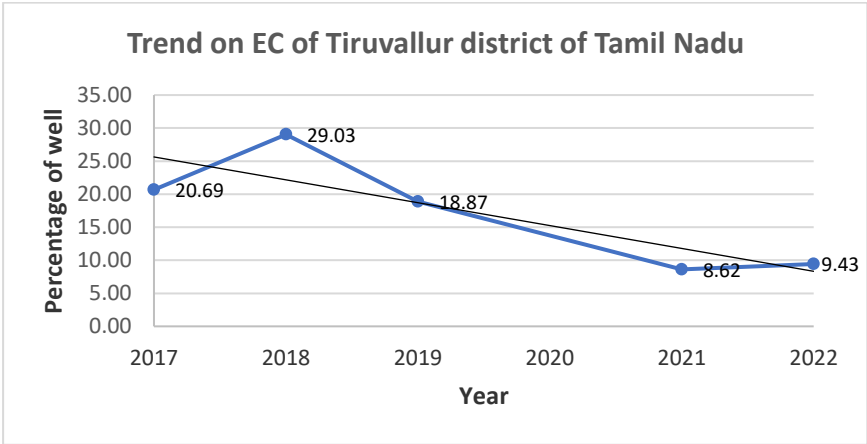


Fig. 7.1.7 Trend on Electrical Conductivity in a district (Tiruvallur) for the period of 2017-2022

7.2 CHLORIDE

Chloride is present in all-natural waters, mostly at low concentrations. It is highly soluble in water and moves freely with water through soil and rock. In ground water the chloride content is mostly below 250 mg/L except in cases where inland salinity is prevalent and in coastal areas.

BIS (Bureau of Indian Standard) have recommended a desirable limit of 250 mg /L of chloride in drinking water; this concentration limit can be extended to 1000 mg/L of chloride in case no alternative source of water with desirable concentration is available. However, ground water having concentration of chloride more than 1000 mg /L are not suitable for drinking purposes.

In Fig 7.2.1, the concentration of chloride (in mg/L) in ground water from observation wells have been used to show distribution patterns of chloride in different ranges of suitability. It is apparent from the map that majority of the samples having chloride values less than 250 mg/L are found mostly in the states of J & K, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, Orissa, M.P, Kerala, Maharashtra, West Bengal, North- Punjab, Sikkim & North-Eastern states.

Water with chloride ranging between 250 and 1000 mg/L falling under ‘permissible’ range are confined mostly to parts of Maharashtra, Western Madhya Pradesh, Southern Punjab, Southern West Bengal, Karnataka, Andhra Pradesh and Western Uttar Pradesh.

Relatively high values of Chloride (>1000 mg/L) are observed in the State of Rajasthan, Gujarat, Andhra Pradesh, Haryana, Maharashtra, Delhi, Karnataka and Tamil Nadu etc. Table 7.2.1 shows the Statewise list of districts affected by high chloride water (>1000 mg/L) and these areas are water quality hot spots from high chloride point of view.

The occurrences of chloride in ground water beyond permissible limit (1000 mg/L) have been shown on the contour map as Fig 7.2.1, State-wise percentage of wells having chloride >1000 mg/L is shown as a bar diagram in Fig 7.2.2 and also given location details in Annexure-II.

Table 7.2.1 State-wise percentage of samples having Chloride >1000mg/L

Sr. No	State and UT	No. of Samples collected (NHS 2022-23)	No. of Samples (Cl >1000 mg/l)	(%) Samples (Cl >1000 mg/l)
1	Andaman & Nicobar Islands	110	0	0.0
2	Andhra Pradesh	940	30	3.2
3	Arunachal Pradesh	18	0	0.0
4	Assam	319	0	0.0
5	Bihar	661	0	0.0
6	Chandigarh UT	1	0	0.0
7	Chhattisgarh	801	0	0.0
8	Dadra and Nagar Haveli and Daman & Diu	22	1	4.5
9	Delhi	95	1	1.1
10	Goa	63	0	0.0
11	Gujarat	657	65	9.9
12	Haryana	463	40	8.6
13	Himachal Pradesh	160	0	0.0
14	Jammu & Kashmir	250	0	0.0
15	Jharkhand	392	0	0.0
16	Karnataka	1141	11	1.0
17	Kerala	265	0	0.0
18	Madhya Pradesh	1136	0	0.0
19	Maharashtra	1358	10	0.7
20	Meghalaya	65	0	0.0
21	Nagaland	15	0	0.0
22	Odisha	1274	0	0.0
23	Pondicherry	16	0	0.0
24	Punjab	338	3	0.9
25	Rajasthan	809	127	15.7
26	Tamil Nadu	1197	41	3.4
27	Telangana	890	11	1.2
28	Tripura	67	0	0.0
29	Uttar Pradesh	917	9	1.0
30	Uttarakhand	396	0	0.0
31	West Bengal	670	2	0.3
	Total (India)	15507	351	2.3

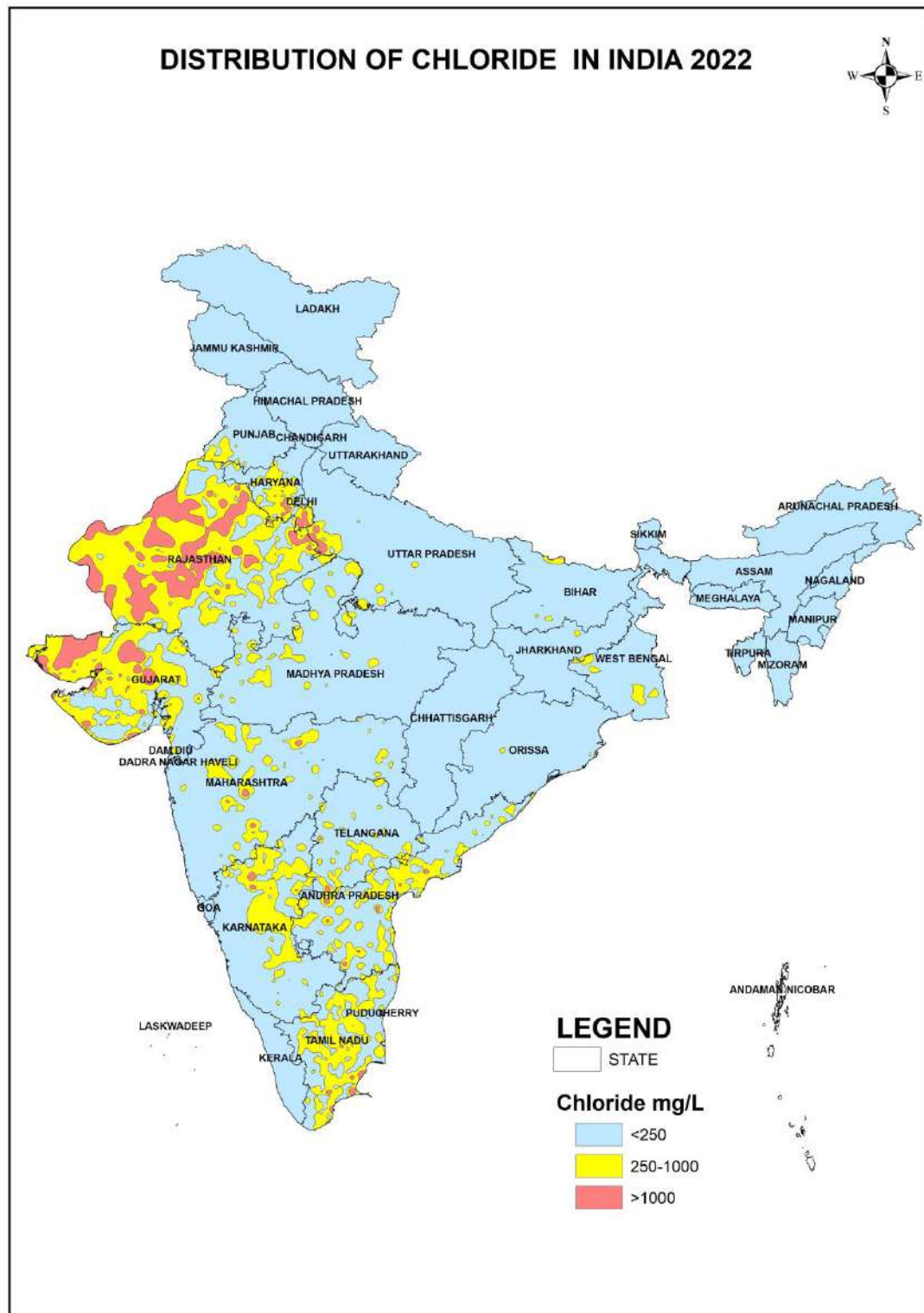


Fig 7.2.1 Spatial Distribution of Chloride during May 2022

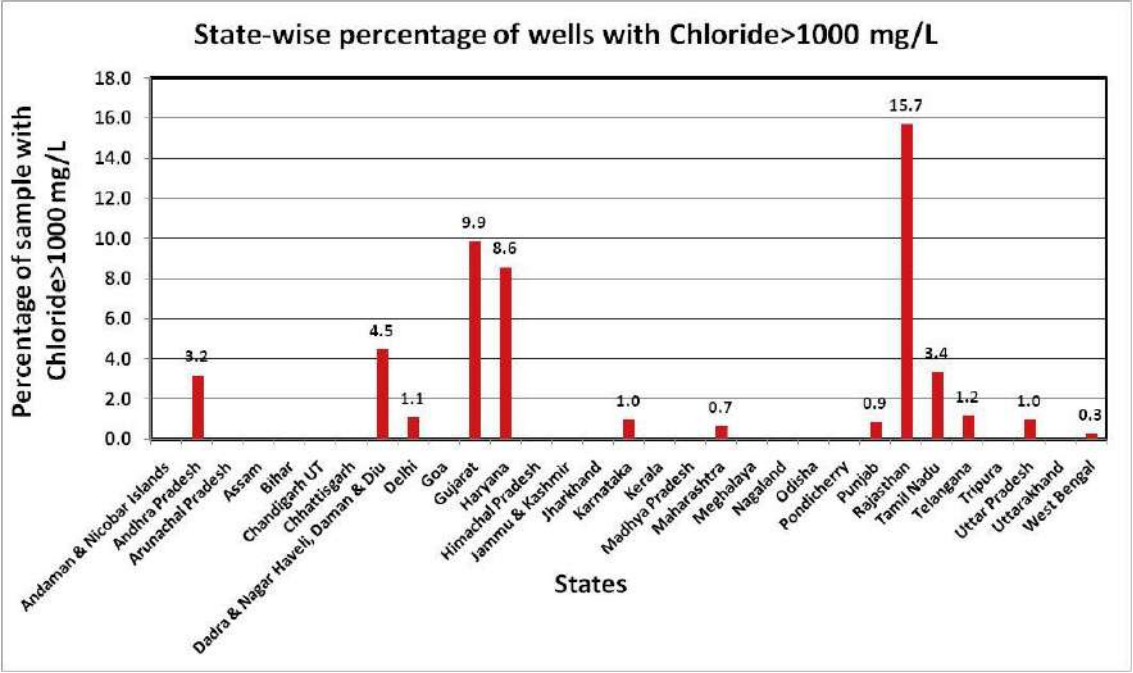


Fig 7.2.2 State-wise percentage of wells having Chloride > 1000 mg/L.

Table-7.2.2: Districts having Chloride concentration (more than 1000 mg/L) in Groundwater in India (NHS 2022-23)

Sr. No	State	Parts of district having Chloride > 1000 mg/L
1.	Andhra Pradesh	Anantpur, Chittur, East Godavari, Guntur, Kadappah, Krishna, Kurnool, Nellore, Prakasham, Srikakulam, West Godavari
2.	DD and DNH	Diu
3.	Delhi	North West Delhi
4.	Gujarat	Ahmedabad, Amreli, Anand, Banas Kantha, Bharuch, Bhavnagar, Chhota Udaipur, Devbhumi Dwarka, Jamnagar, Junagadh, Kachchh, Kheda, Morbi, Patan, Porbandar, Rajkot, Sabarkantha, Surendra Nagar, Valsad
5.	Haryana	Bhiwani, Faridabad, Gurgaon, Hisar, Jhajjar, Jind, Mahendragarh, Mewat, Palwal, Rewari, Rohtak, Sirsa, Sonipat
6.	Karnataka	Bagalkot, Belgaum, Bijapur, Raichur, Yadgir.
7.	Maharashtra	Ahmednagar, Akola, Amravati, Aurangabad, Beed, Chandrapur, Jalna, Parbhani, Solapur
8.	Punjab	Fazilka, Muktsar
9.	Rajasthan	Alwar, Banswara, Barmer, Bharatpur, Bhilwara, Bikaner, Churu, Dausa, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhunjhunu, Jodhpur, Karauli, Nagaur, Pali, Sawai Madhopur, Sikar, Sirohi, Udaipur.

Sr. No	State	Parts of district having Chloride > 1000 mg/L
10.	Tamil Nadu	Chennai, Coimbatore, Dindigul, Erode, Kancheepuram, Karur, Krishnagiri, Madurai, Namakkal, Perambalur, Pudukkottai, Ramanathapuram, Salem, Sivaganga, Tirunelveli, Tiruppur, Trichy, Tuticorin, Villupuram, Virudhunagar
11.	Telangana	Khammam, Mahboobnagar, Medak, Nalgonda
12.	Uttar Pradesh	Agra, Mahamaya Nagar, Mathura
13.	West Bengal	Howrah, South 24 Parganas

Table-7.2.3: Comparative Change in number of Districts having Cl > 1000 mg/L in Various states

S. No.	State	Nos. of districts having Cl > 1000 mg/L.		
		2015	2022	Increase/Decrease
1.	Andhra Pradesh	10	11	1
2.	Delhi	03	01	-2
3.	Gujarat	17	21	4
4.	Haryana	04	13	9
5.	Karnataka	05	05	0
6.	Madhya Pradesh	01	00	-1
7.	Maharashtra	06	09	3
8.	Orissa	02	00	-2
9.	Punjab	01	02	1
10.	Rajasthan	23	22	-1
11.	Tamil Nadu	07	20	13
12.	Telangana	04	04	0
13.	Uttar Pradesh	02	03	1
14.	West Bengal	01	02	1
	Total	104	113	9

In comparison to 2015, it has been observed that the no. of districts having chloride more than 1000 mg/L in various States has increased in 2022 by 8.65 % (Table 7.2.3 & Fig.7.2.3). In Gujarat, Haryana, Maharashtra, Tamilnadu, Uttar Pradesh and West Bengal has the increase in the no. of district is a matter of concern. However, in some States it has decreased also, which may be because of dilution in that particular area.

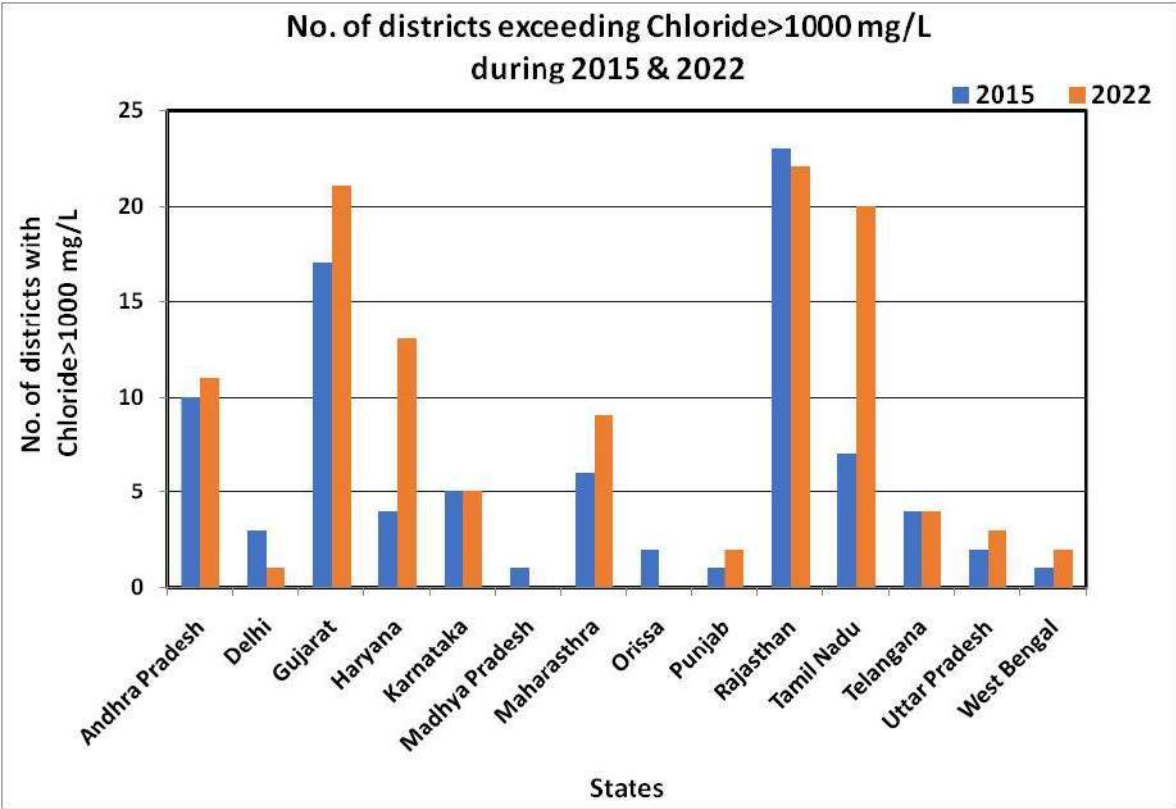


Fig. 7.2.3 Comparison on No of districts exceed Chloride >1000 mg/L during 2015 and 2022.

Techniques Available for Removal of Salinity

Traditionally, distillation has been the method used for desalting water for human consumption or other use. Membrane methods have emerged through the last 50 years and now predominate among the desalination practices. The following describes each of the various methods used for water desalination treatment.

1. Distillation Methods

There are several variations in distillation technology used in desalination. They are all based on the vapourization of liquid water when brought to its boiling point. The nearly pure water vapour produced is condensed and collected for use, while dissolved salts remain behind in the remaining liquid feed water. Some of the methods by which distillation is practiced are as follows:

- Multi-stage flash;
- Multiple effect;
- Vapour compression;
- Membrane distillation; and
- Solar humidification.

2. Membrane Technologies

Membrane processes involve passing of impaired feed water through a semi-permeable material which can filter out unwanted dissolved or undissolved constituents, depending on the size and treatment of the openings. Membrane technologies identified include:

- Reverse Osmosis;
- Microfiltration/Ultrafiltration/Nanofiltration;
- Electrodialysis Reversal; and
- Forward Osmosis.

3. Hybrid Technology: A method of reducing overall costs of desalination can be the use of hybrid systems using both RO and distillation processes. Such a system could provide a more suitable match between power and water development needs.

7.3 FLUORIDE

Fluorine is a fairly common element but it does not occur in the elemental state in nature because of its high reactivity. Fluorine is the most electronegative and reactive of all elements that occur naturally within many types of rock. It exists in the form of fluorides in a number of minerals of which fluor spar, cryolite, fluorite and fluorapatite are the most common. Fluorite (CaF_2) is a common fluoride mineral.

Most of the fluoride found in groundwater is naturally occurring from the breakdown of rocks and soils or weathering and deposition of atmospheric particles. Most of the fluorides are sparingly soluble and are present in ground water in small amounts. The occurrence of fluoride in natural water is affected by the type of rocks, climatic conditions, nature of hydrogeological strata and time of contact between rock and the circulating ground water. Presence of other ions, particularly bicarbonate and calcium ions also affect the concentration of fluoride in ground water.

It is well known that small amounts of fluoride (less than 1.0 mg/L) have proven to be beneficial in reducing tooth decay. Community water supplies commonly are treated with NaF or fluorosilicates to maintain fluoride levels ranging from 0.8 to 1.2 mg/L to reduce the incidence of *dental carries*. However, high concentrations such as 1.5 mg/L of F and above have resulted in staining of tooth enamel while at still higher levels of fluoride ranging between 5.0 and 10 mg/L, further pathological changes such as stiffness of the back and difficulty in performing natural movements may take place.

BIS has recommended an upper desirable limit of 1.0 mg/L of F^- as desirable concentration of fluoride in drinking water, which can be extended to 1.5 mg/L of F in case no alternative source of water is available. Water having fluoride concentration of more than 1.5 mg/L are not suitable for drinking purposes.

The fluoride content in groundwater from observation wells in a major part of the country is found to be less than 1.0 mg/L. The distribution of ground water samples with fluoride concentration more than 1.5 mg/L have been depicted on the map as Fig. 7.3.1. It is observed that there are several locations in the States of Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Rajasthan, Chhattisgarh, Haryana, Orissa, Punjab, Tamilnadu, Kerala, Telangana, Haryana, Uttar

Pradesh West Bengal, Bihar, Delhi, Jharkhand, Maharashtra, and Assam West Bengal where the fluoride in ground water exceeds 1.5 mg/L. The details of locations where fluoride concentration more than 1.5 mg/l is given in Annexure III. The list of districts showing localized occurrence of fluoride in ground water in excess of 1.5mg/L is given in table 7.3.1

The occurrences of fluoride in groundwater beyond permissible limit (1.5 mg/L) have also been shown on the contour map as Fig. 7.3.1, State-wise percentage of wells having fluoride >1.5mg/L is shown as a bar diagram in Fig 7.3.2.

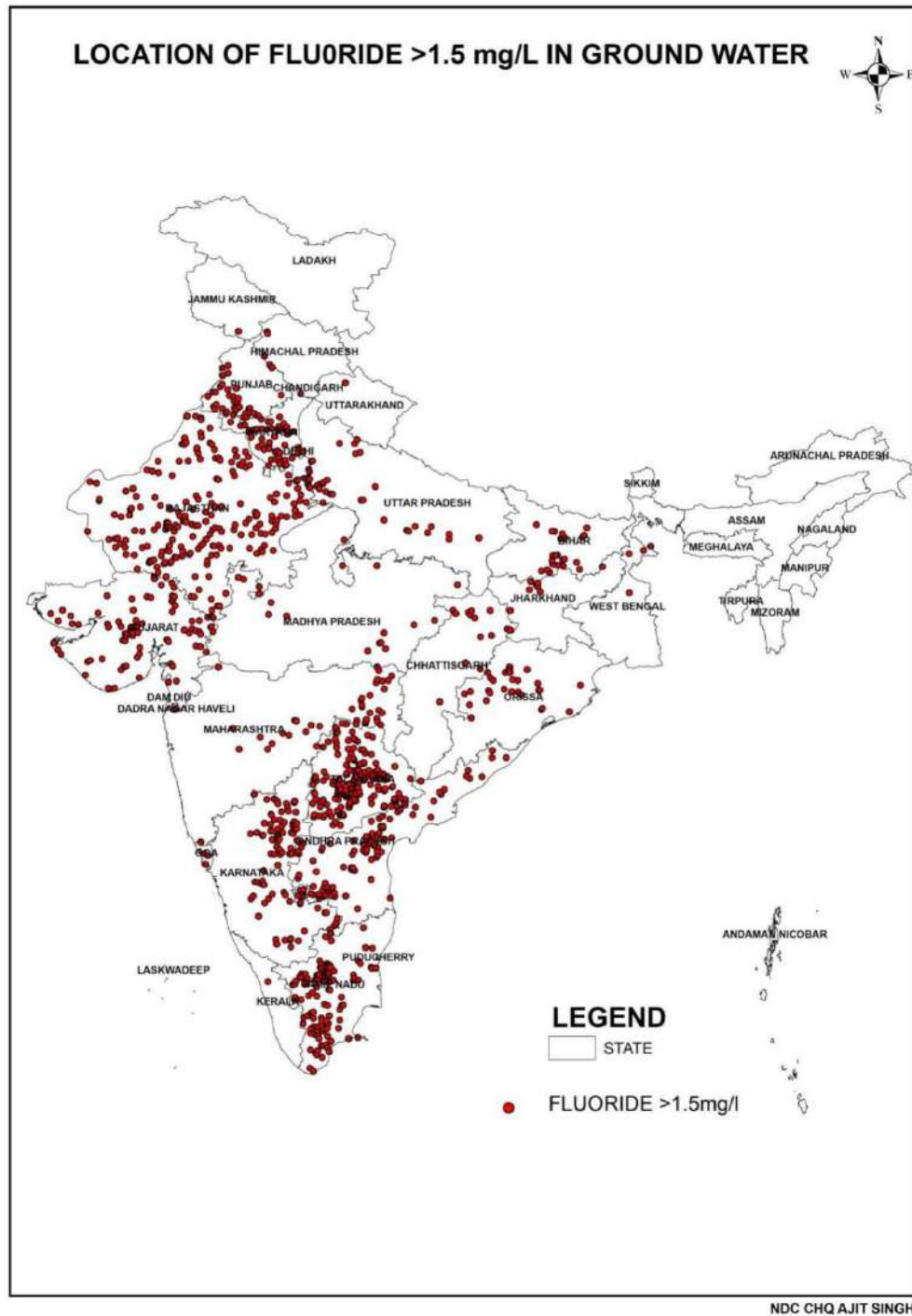


Fig 7.3.1 Locations having Fluoride concentration > 1.5 mg/L during May 2022.

Table 7.3.1 State-wise percentage of wells having fluoride >1.5mg/L

S. No	State and UT	No. of Samples collected (NHS 2022-23)	No. of Samples (F >1.5 mg/l)	% of Samples (F >1.5 mg/l)
1	Andaman & Nicobar Islands	110	0	0.0
2	Andhra Pradesh	940	98	10.4
3	Arunachal Pradesh	18	0	0.0
4	Assam	319	0	0.0
5	Bihar	661	23	3.5
6	Chandigarh UT	1	0	0.0
7	Chhattisgarh	801	14	1.7
8	Dadra and Nagar Haveli and Daman & Diu	22	1	4.5
9	Delhi	95	4	4.2
10	Goa	63	3	4.8
11	Gujarat	657	78	11.9
12	Haryana	463	53	11.4
13	Himachal Pradesh	160	7	4.4
14	Jammu & Kashmir	250	1	0.4
15	Jharkhand	392	11	2.8
16	Karnataka	1141	91	8.0
17	Kerala	265	1	0.4
18	Madhya Pradesh	1136	15	1.3
19	Maharashtra	1358	38	2.8
20	Meghalaya	65	0	0.0
21	Nagaland	15	0	0.0
22	Odisha	1274	30	2.4
23	Pondicherry	16	0	0.0
24	Punjab	338	33	9.8
25	Rajasthan	809	213	26.3
26	Tamil Nadu	1197	121	10.1
27	Telangana	890	168	18.9
28	Tripura	67	0	0.0
29	Uttar Pradesh	917	39	4.3
30	Uttarakhand	396	2	0.5
31	West Bengal	670	4	0.6
	Total(India)	15507	1048	6.8

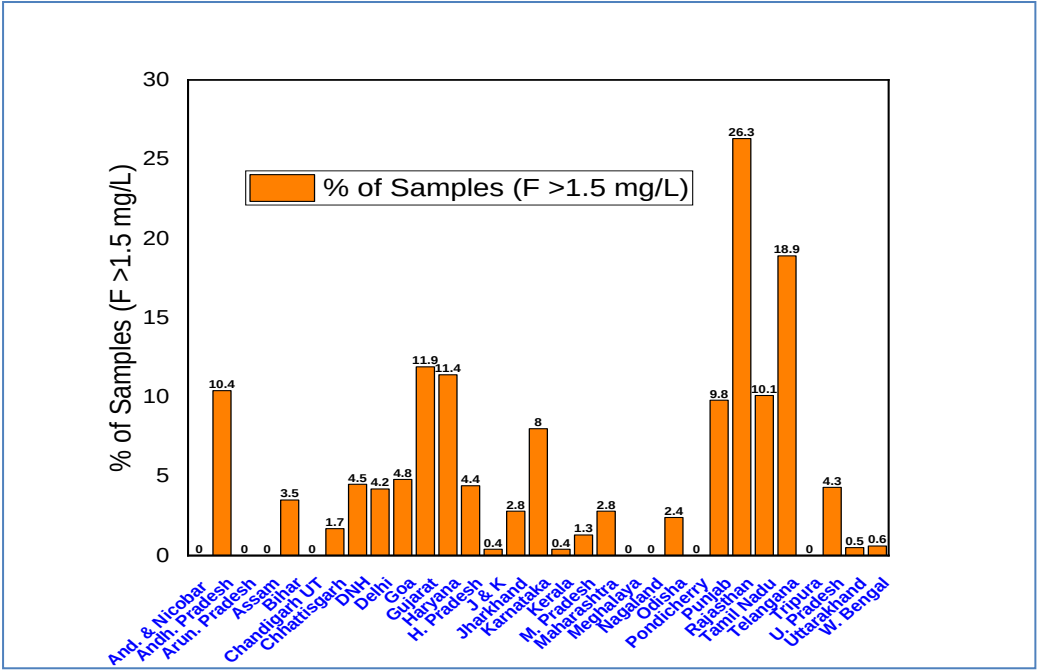


Fig 7.3.2 State-wise percentage of wells having fluoride >1.5 mg/L

Table 7.3.2 Districts showing localized occurrence of Fluoride (>1.5mg/L) in Groundwater in India

Sl. No	State	Parts of Districts having F > 1.5mg/L
1.	Andhra Pradesh	Anantpur, Chittur, East Godavari, Guntur, Kadapa, Krishna, Kurnool, Nellore, Prakasam, Srikakulam, Vijaynagaram, Visakhapatnam, West Godavari
2.	Bihar	Gaya, Jamui, Muzaffarpur, Nalanda, Nawada, Samastipur, Sheikhpura
3.	Chhattisgarh	Balodabazar, Balrampur, Dhamtari, Jashpur, Koriya, Raigarh, Surajpur
4.	Dadra And Nagar Haveli and Daman & Diu	Dadra And Nagar Haveli
5.	Delhi	East Delhi, North West Delhi, South Delhi
6.	Goa	North Goa, South Goa
7.	Gujarat	Amreli, Anand, BanasKantha, Bharuch, Bhavnagar, Botad, Chhota Udaipur, Dahod, Devbhumi Dwarka, Gir Somnath, Junagadh, Kachchh, Mahisagar, Morbi, Navsari, Panch Mahal, Patan, Rajkot, Sabarkantha, Surat, Surendra Nagar, Vadodara,

Sl. No	State	Parts of Districts having F > 1.5mg/L
8.	Haryana	Bhiwani, Fatehabad, Gurugram, Hisar, Jhajjar, Jind, Kaithal, Karnal, Mahendragarh, Palwal, Panipat, Rewari, Sirsa, Sonipat,
9.	Himachal Pradesh	Chamba, Sirmour, Una
10	Jammu & Kashmir	Samba
11	Jharkhand	Chhatra, Deoghar, Godda, Garhwa, Bokaro, Gridih
12	Karnataka	Bagalkot, Ballari, Bijapur, Chikballpura, Chamarajanagara, Chitradurg, Dakshina Davanagere, Gulbarga, Kolar, Kopal, Mandya, Mysore, Raichur, Ramnagara, Shivmoga, Tumkur, Vijayanagara, Yadgir
13	Kerala	Malappuram
14	Madhya Pradesh	Anuppur, Chhatarpur, Datia, Dindori, Neemuch, Seoni, Shajapur
15	Maharashtra	Ahmednagar, Beed, Bhandara, Chandrapur, Gadchiroli, Gondia, Hingoli, Nanded, Nandubar, Parbhani, Yavatmal,
16	Orissa	Anugul, Balangir, Baudh, Bhadrak, Debagarh, Kalahandi, Nayagarh, Nuapada, Puri, Sambalpur, Sonapur
17	Punjab	Bathinda, Faridkot, Fazilka, Firozpur, Mansa, Moga, Muktsar, Patiala, Sangrur, Taran Taran
18	Rajasthan	Ajmer, Alwar, Banswara, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Churu, Dausa, Dongarapur, Ganganagar, Hanumanghar, Jaipur, Jaisalmer, Jalore, Jhunjhun, Jodhpur, Karauli, Kota, Nagaur, Pali, Pratapgarh, Rajsamnd, Sawai Madhvpur, Sikar, Sirohi, Tonk, Udaipur
19	Tamil Nadu	Ariyalur, Cuddalore, Coimbatore, Dindigul, Erode, Kanyakumari, Karur, Krishnagiri, Maduri, Namakkal, Pudukkottai, Perambalur, Ramnathpuram, Selem, Sivaganga, Theni, Tripur, Tirunelveli, Tiruvallur, Tuticorin, Vellore, Villupuram, Virudhunagar,
20	Telangana	Adilabad, Hyderabad, Karimnagar, Khammam, Mahbubnagar, Medak, Nalgonda, Nizamabad, Ranga Reddy, Warangal
21	Uttar Pradesh	Agra, Aligarh, Azamgarh, Farrukhabad, Fatehpur, Firzabad, Gautam Buddha Nagar, JP Nagar, Kanpur Dehat, Lalitpur, Mainpuri, Mathura, Pratapgarh, Rai Bareli, Rampur
22	Uttarakhand	Uttarkashi
23	West Bengal	Dakshin Dinajpur, Malda, Murshidabad

Table-7.3.3: Comparative Change in number of Districts having F > 1.5 mg/L in various states.

S. No.	State	Nos. of districts having F> 1.5 mg/L.		
		2015	2022	Increase/Decrease
1.	Andhra Pradesh	09	13	4
2.	Assam	02	00	-2
3.	Bihar	05	8	3
4.	Chhattisgarh	07	07	0
5.	Delhi	05	03	-2
6.	DNH	0	1	1
7.	Goa	0	2	2
8.	Gujarat	17	24	7
9.	Haryana	10	14	4
10.	Himachal Pradesh	01	03	2
11.	Jammu & Kashmir	03	01	-2
12.	Jharkhand	06	06	0
13.	Karnataka	21	18	-3
14.	Kerala	01	01	0
15.	Maharashtra	06	11	5
16.	Madhya Pradesh	10	07	-3
17.	Odisha	14	11	-3
18.	Punjab	06	10	4
19.	Rajasthan	28	30	2
20.	Tamil Nadu	08	23	15
21.	Telangana	09	1	-8
22.	Uttar Pradesh	18	15	-3
23.	Uttarakhand	01	01	0
24.	West Bengal	04	03	-1
	Total	191	230	39

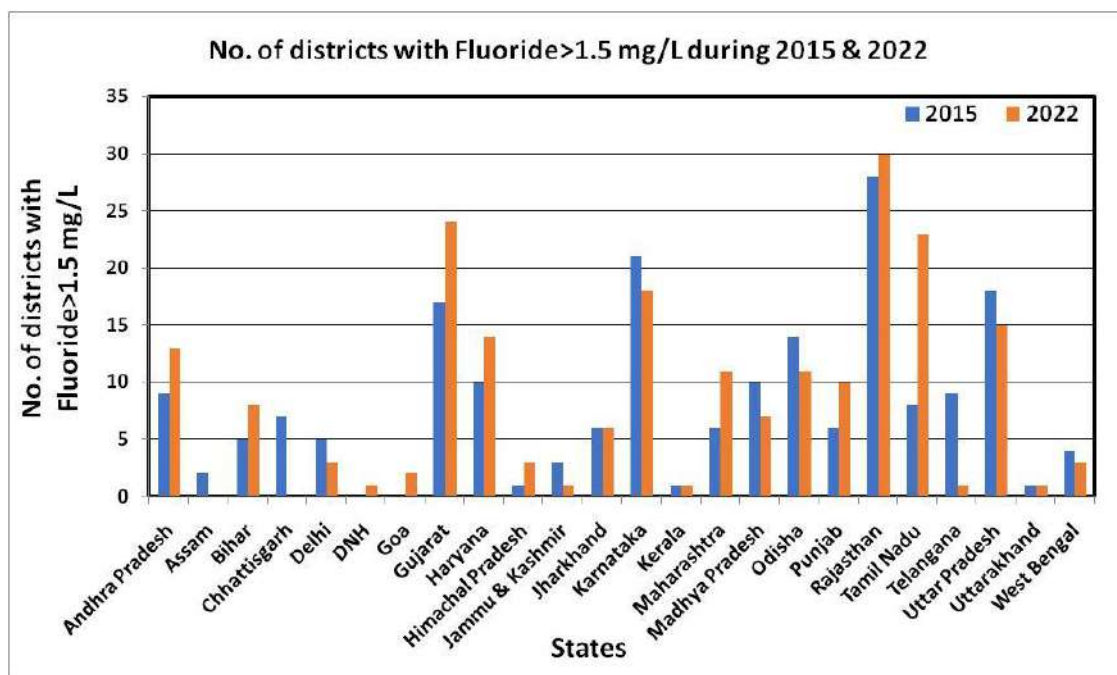


Fig 7.3.3 Comparison on No of districts exceed Fluoride >1.5 during 2015 and 2022

It has been observed (Table 7.3.3) that total number of districts affected by high fluoride in different States has increased by 16.75 % in 2022 as compared to the data available in 2015. In Andhra Pradesh, Bihar, Gujarat, Haryana, Maharashtra, Punjab, Rajasthan and Tamilnadu, Telangana has the increase in the no. of district is a matter of concern.

7.3.1 TREND ON FLUORIDE

The occurrence of fluoride in groundwater is mainly due to weathering and leaching of fluoride bearing minerals from rocks and sediments. To assess the trend of ground water pollution due to geogenic activity, the percentage of well exceeds the permissible limit of 1.5mg/L for the period of 2017 to 2022 were compared and presented in the Table 7.3.4 and Fig 7.3.4 and observed that the percentage of samples exceed the permissible limit of fluoride 1.5 mg/L were ranging between 5 - 8 % and no significant trend was noticed. **The no of wells monitored in the year 2020 and 2021 is comparatively less due to COVID pandemic situation.** The number of fluoride affected district has increased in the year 2022 as more number of piezometers (deeper wells) was included in the monitoring wells after 2019. Trend on water quality for fluoride was prepared for the state of Tamil Nadu is showing a similar pattern (Fig 7.3.5).

Trend on fluoride in a district, Dindigul of Tamil Nadu shows (Fig 7.3.6) an decreasing trend and Namakkal district of Tamil Nadu shows (Fig 7.3.7) an increasing trend depends on the rain fall pattern and more piezometer/bore wells were included in monitoring as many monitoring dug wells were dried up in the district respectively.

Table 7.3.4: Percentage of wells Exceed fluoride >1.5 mg/L during the period of 2017-2022

Year	Total Number of samples analysed	No. of districts affected by Fluoride	No. of locations affected by Fluoride	% of locations affected by Fluoride (F >1.5mg/L)
2017	13225	207	736	5.57
2018	13229	212	862	6.52
2019	12475	226	899	7.21
2020	6366	131	449	7.05
2021	8482	142	450	5.31
2022	15507	392	1048	6.76

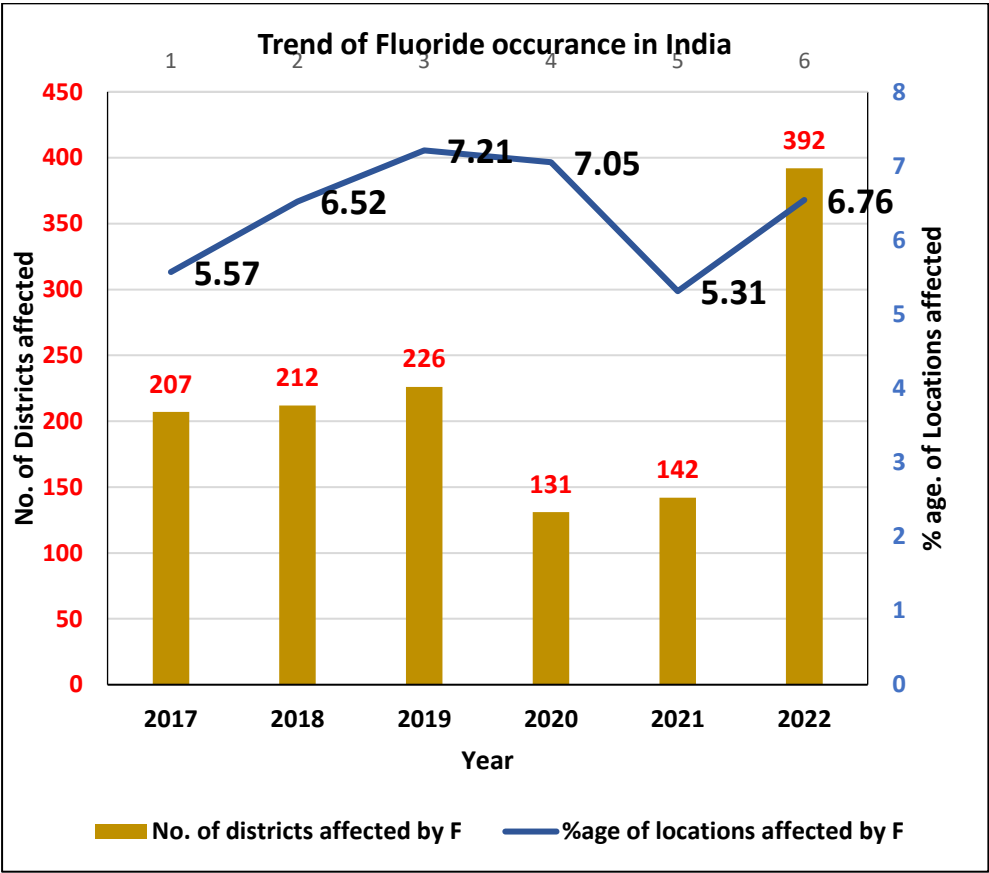


Fig. 7.3.4 Trend of Fluoride occurrence in India

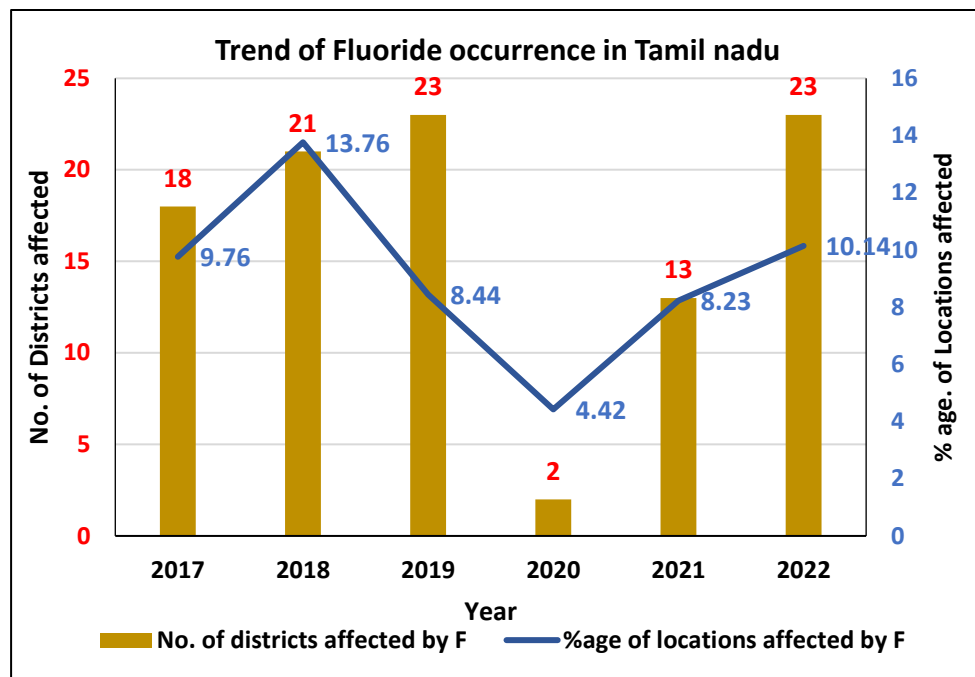


Fig. 7.3.5 Trend of Fluoride occurrence in Tamil Nadu

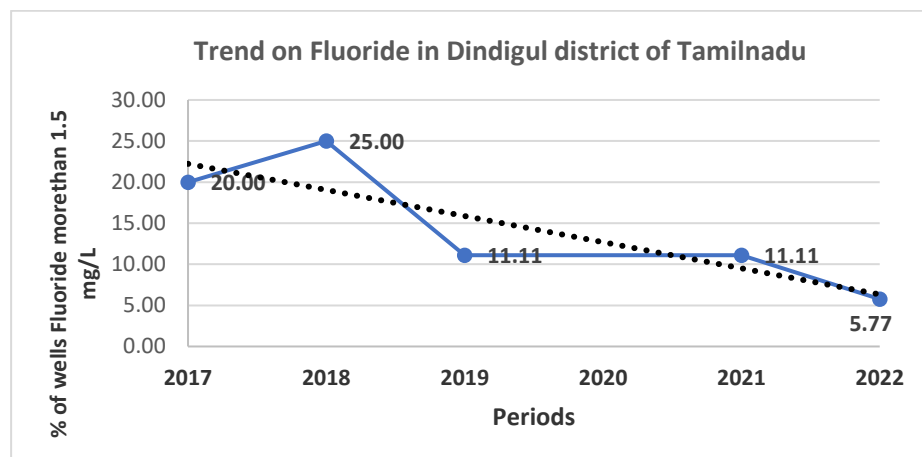


Fig 7.3.6 Trend on Fluoride a district (Dindigul of Tamil Nadu) for the period of 2017-2022

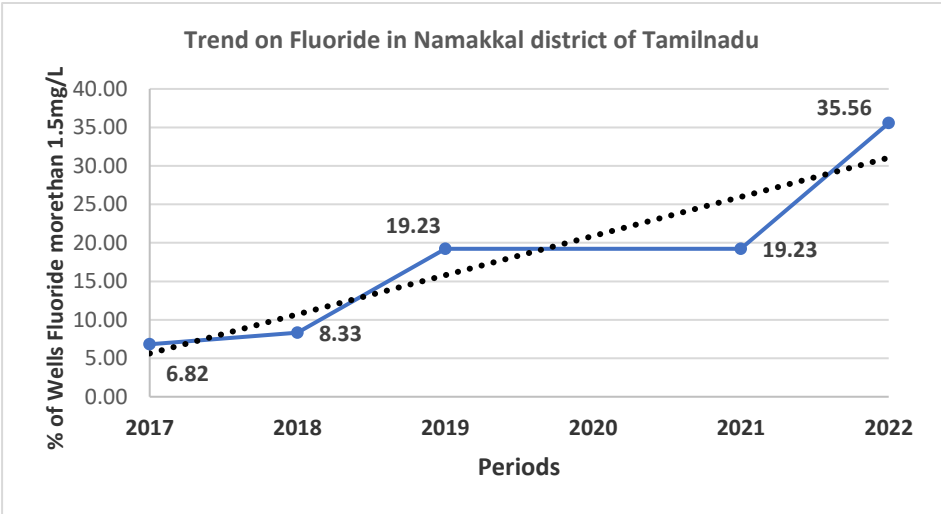


Fig 7.3.7 Trend on Fluoride in a district (Namakkal of Tamil Nadu) for the period of 2017-2022

Remedial Measures for Fluoride

The fluoride remedial measures broadly adopted are ex-situ techniques. They can be classified into three major categories.

(a) Adsorption and ion exchange

This technique functions on the adsorption of fluoride ions onto the surface of an active agent such as activated alumina, red mud, bone char, brick pieces column, mud pot and natural adsorbents where fluoride is removed by ion exchange or surface chemical reaction with the solid bed matrix.

Activated alumina: Activated alumina is a highly porous aluminum oxide exhibiting high surface area. Alumina has a high preference for fluoride compared to other anionic species, and hence is an attractive adsorbent. The crystal structure of alumina contains cation lattice discontinuities giving rise to localized areas of positive charge which makes it attract various anionic species. It also does not shrink, swell, soften nor disintegrate when immersed in water. The maximum absorption capacity of activated alumina for fluoride is found to be 3.6 mg F/g of alumina.

Ion-Exchange resins: Synthetic chemicals, namely, anion and cation exchange resins have been used for fluoride removal. Some of these are Polyanion (NCL), Tul-sion A - 27, Deacedite FF (IP), Amberllite IRA 400, LewatitMIH - 59, and AmberliteXE - 75. These resins have been used in chloride and hydroxy form. The fluoride exchange capacity of these resins depends upon the ratio of fluoride to total anions in water.

(b) Coagulation-precipitation

Precipitation methods are based on the addition of chemicals (coagulants and coagulant aids) and the subsequent precipitation of a sparingly soluble fluoride salt as insoluble. Fluoride removal is accomplished with separation of solids from liquid. Aluminium salts (eg. Alum), lime, Poly

Aluminium Chloride, Poly Aluminium Hydroxy sulphate and Brushite are some of the frequently used materials in defluoridation by precipitation technique. The best example for this technique is the famous Nalgonda technique.

Nalgonda Technique

Nalgonda technique involves addition of Aluminium salts, lime and bleaching powder followed by rapid mixing, flocculation, sedimentation, filtration and disinfection. It is opined that this technique is preferable at all levels because of the low price and ease of handling, is highly versatile and can be used in various scales from household level to community scale water supply.

The Nalgonda technique can be used for raw water having fluoride concentration between 1.5 and 20 mg/L and the total dissolved solids should be <1500 mg/L, and total hardness < 600 mg/L. The alkalinity of the water to be treated must be sufficient to ensure complete hydrolysis of alum added to it and to retain a minimum residual alkalinity of 1 - 2 meq/L in the treated water to achieve a pH of 6.5 - 8.5 in treated water. Several researchers have attempted to improve the technique by increasing the removal efficiency of fluoride using Poly Aluminium Chloride (PAC) and Poly Aluminium Hydroxy Sulphate (PAHS).

(c) Membrane techniques

Reverse osmosis, nanofiltration, dialysis and electro dialysis are physical methods that have been tested for defluoridation of water. Though they are effective in removing fluoride salts from water, however, there are certain procedural disadvantages that limit their usage on a large scale.

7.4 NITRATE

Nitrate is a naturally occurring compound that is formed in the soil when nitrogen and oxygen combine. The primary source of all nitrates is atmospheric nitrogen gas. This is converted into organic nitrogen by some plants by a process called nitrogen fixation. Dissolved Nitrogen in the form of Nitrate is the most common contaminant of ground water. Nitrate in groundwater generally originates from non-point sources such as leaching of chemical fertilizers & animal manure, groundwater pollution from septic and sewage discharges etc. It is difficult to identify the natural and man-made sources of nitrogen contamination of ground water. Some chemical and micro-biological processes such as nitrification and denitrification also influence the nitrate concentration in ground water.

As per the BIS Standard for drinking water the maximum desirable limit of Nitrate concentration in ground water is 45 mg/L with no relaxation. Though, Nitrate is considered relatively non-toxic, a high nitrate concentration in drinking water is an environmental health concern arising from increased risks of methemoglobinemia particularly to infants. Adults can tolerate little higher concentrations. The specified limits are not to be exceeded in public water supply. If the limit is exceeded, water is considered to be unfit for human consumption.

The occurrences of Nitrate in ground water beyond permissible limit (45 mg /L) have been shown on the map as a point source Fig 7.4.1 and also given in Annexure-IV. Table-7.4.1 shows the districts where nitrate has been found in excess of 45 mg/L in groundwater.

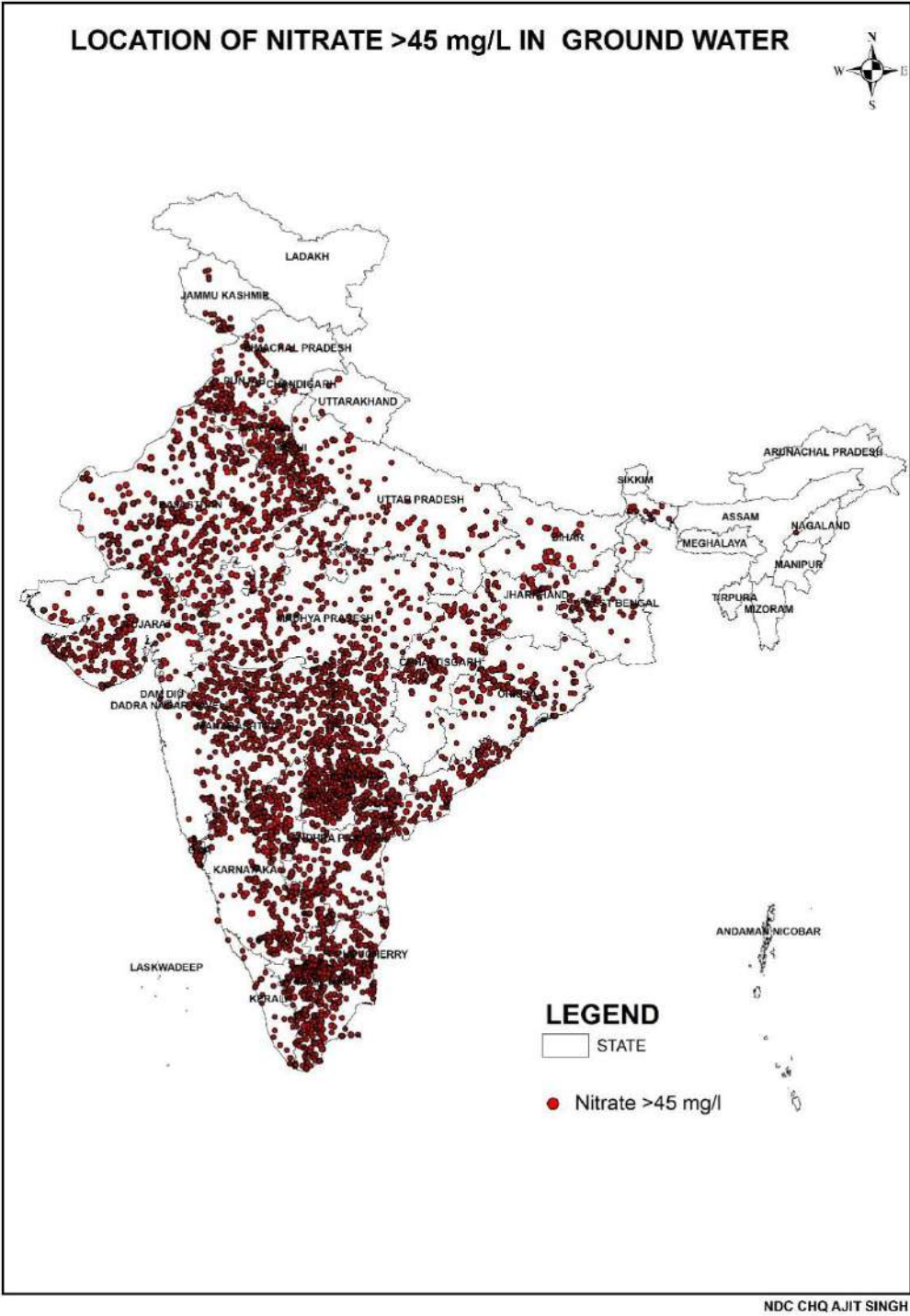


Fig 7.4.1 Locations having Nitrate concentration > 45 mg/L during 2022-23

Table 7.4.1: State-wise percentage of wells having Nitrate > 45 mg/L

S. No	State and UT	No. of Samples collected (NHS 2022-23)	No. of Samples (NO ₃ > 45 mg/L)	(%) Samples (NO ₃ > 45mg/L)
1	Andaman & Nicobar Islands	110	0	0.0
2	Andhra Pradesh	940	295	31.4
3	Arunachal Pradesh	18	0	0.0
4	Assam	319	0	0.0
5	Bihar	661	7	1.1
6	Chandigarh UT	1	0	0.0
7	Chhattisgarh	801	114	14.2
8	Dadra and Nagar Haveli and Daman & Diu	22	1	4.5
9	Delhi	95	17	17.9
10	Goa	63	4	5.3
11	Gujarat	657	161	24.7
12	Haryana	463	75	16.2
13	Himachal Pradesh	160	12	7.5
14	Jammu & Kashmir	250	25	10.0
15	Jharkhand	392	50	12.8
16	Karnataka	1141	292	25.6
17	Kerala	265	23	8.7
18	Madhya Pradesh	1136	275	24.2
19	Maharashtra	1358	510	37.6
20	Meghalaya	65	0	0.0
21	Nagaland	15	1	6.7
22	Odisha	1274	105	8.2
23	Pondicherry	16	9	56.3
24	Punjab	338	68	20.3
25	Rajasthan	809	339	41.9
26	Tamil Nadu	1197	452	37.8
27	Telangana	890	350	39.3
28	Tripura	67	0	0.0
29	Uttar Pradesh	917	89	9.7
30	Uttarakhand	396	8	2.0
31	West Bengal	670	67	10.0
	Total (India)	15507	3348	21.6

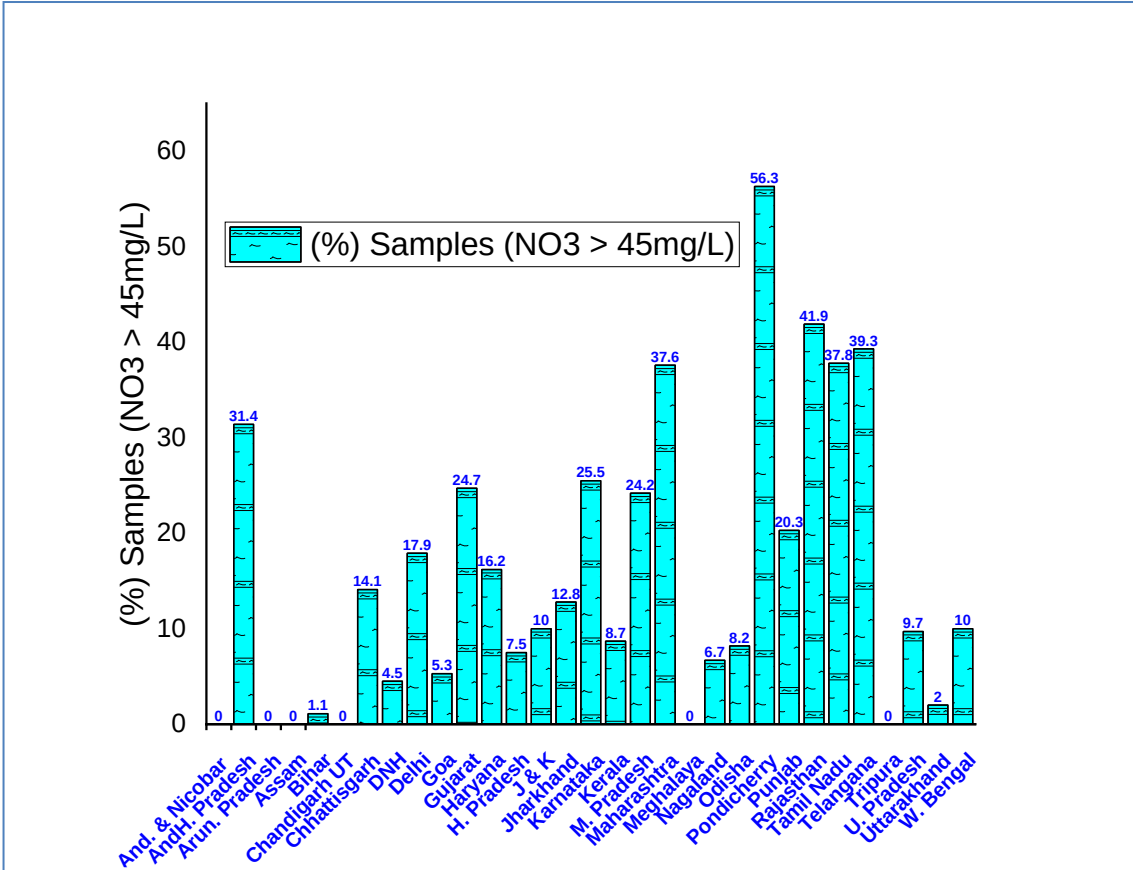


Fig 7.4.2 State-wise samples exceed Nitrate 45 mg/L (NHS 2022-23)

Table 7.4.2: List of Districts Showing Localized Occurrence of Nitrate (>45 mg/L) in Ground Water in Different States of India

Sl. No.	State	Parts of Districts having Nitrate > 45 mg/L
1.	Andhra Pradesh	Anantpur, Chittoor, East Godawari, Guntur, Kdapa, Krishna, Kurnool, Nellore, Prakasam, Srikakulam, Vijyanagaram, Visakhapatnam, West Godavari
2.	Bihar	Bhagalpur, Bhojpur, Kaimur, Rohtas, Siwan,
3.	Chhattisgarh	Balod, Balodbazar, Balrampur, Bastar, Bemetara, Bilaspur, Dhamtari, Durg, Gariyabandh, Janjgir, Champa, Jashpur, Kawardha, Koriya, Mahasamund, Raigarh, Raipur, Rajnandgaon, Surajpur, Surguja
4.	Dadra And Nagar Haveli and Daman & Diu	Daman and Dadra and Nagar Haveli
5.	Delhi	East Delhi, North Delhi, South Delhi, South West Delhi
6.	DNH	Diu

7.	Goa	South Goa
8.	Gujarat	Ahmadabad, Amreli, Anand, Aravalli, Banaskantha, Bharuch, Bhavnagar, Botad, Chhota Udaipur, Dohad, Devbhumi Dwaraka, Gir Somnath, Jamnagar, Junagadh, Kachchh, Kheda, Mahesena, Mahisagar, Morbi, Panchmahals, Patan, Porbandar, Rajkot, Sabarkantha, Surat, Surendranagar, Valsad
9.	Haryana	Bhiwani, Faridabad, Fatehabad, Gurugram, Hissar, Jhajjar, Jind, Kaithal, Mahendragarh, Mewat, Palwal, Panchkula, Panipat, Rewari, Rohtak, Sirsa, Sonipat
10.	Himachal Pradesh	Kangra, Kullu, Solan, Una
11.	Jammu & Kashmir	Baramulla, Jammu, Kupwara, Rajouri, Reassi, Samba, Srinagar, Udhampur
12.	Jharkhand	Garhwa, Ramgarh, Bokaro, Giridih, Ranchi, Gumla, Hazaribagh, Dhanbad, Gumla, Dumka, Godda, Kodarma, Shahenganj
13.	Karnataka	Bagalkot, Ballari, Belagavi, Bangalore Rural, Bangalore Urban, Bidar, Bijapur, Chamarajanagara, Chikballapur, Chitradurga, Davanagere, Gulbarga, Kolar, Kodagu, Koppal, Mandya, Mysore, Raichur, Ramnagara, Shivmoga, Tumkur, Udupi, Uttar Kannada, Vijayanagara, Yadgir
14.	Kerala	Alappuzha, Ernakulam, Idukki, Kannur, Kasaragod, Kollam, Kottayam, Malappuram, Palakkad, Pathanamthitta, Thrissur, Trivandrum
15.	Madhya Pradesh	Agar Malwa, Alirajpur, Ashok Nagar, Balaghat, Barwani, Betul, Bhind, Bhopal, Burhanpur, Chhatarpur, Chhindwara, Damoh, Dewas, Dhar, Gwalior, Harda, Hoshangabad, Indore, Jabalpur, Jhabua, Katni, Khandwa, Khargone, Mandla, Mandsaur, Morena, Narsinghpur, Panna, Raisen, Rajgarh, Ratlam, Rewa, Sagar, Satna, Sehore, Seoni, Shahdol, Shajapur, Sheopur, Shivpuri, Sidhi, Tikamgarh, Ujjain, Umaria, Vidisha
16.	Maharashtra	Ahmednagar, Akola, Amravati, Aurangabad, Beed, Bhandara, Buldana, Chandrapur, Dhule, Gadchiroli, Gondia, Hingoli, Jalgaon, Jalna, Kolhapur, Latur, Nagpur, Nanded, Nandurbar, Nashik, Osmanabad, Parbhani, Pune, Sangli, Satara, Solapur, Thane, Wardha, Washim, Yavatmal
17.	Nagaland	Dimapur
18.	Odisha	Anugul, Balangir, Baleswar, Bargarh, Baudh, Bhadrak, Cuttack, Dhenkanal, Gajapati, Ganjam, Kalahandi, Kandhamal, Kendrapara, Khordha, Koraput, Malkangiri, Mayurbhanj, Nabarangapur, Nayagarh, Puri, Roygada, Sambalpur, Sonapur
19.	Pondicherry	Karaikal, Pondicherry

20.	Punjab	Amritsar, Bathinda, Faridkot, Fazilka, Firozpur, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Mansa, Moga, Muktsar, Nawanshahr, Pathankot, Patiala, Ropar, Sangrur, SAS nagar, Taran Taran
21.	Rajasthan	Ajmer, Alwar, Banaswara, Baran, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittaurgarh, Churu, Dausa, Dhaulpur, Dungarpur, Ganganagar, Hanumangarh, Jaipur, Jaisalmer, Jalor, Jhalawar, Jhunjhunun, Jodhpur, Karauli, Kota, Nagaur, Pali, Pratapgarh, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk, Udaipur
22.	Tamil Nadu	Ariyalur, Chennai, Cuddalore, Dharampuri, Dindigul, Erode, Kancheepuram, Namakkal, Thiruannamalai, Tirunelveli, Tuticorin, Villupuram, Coimbatore, Dharampuri, Dindigul, Karaikal, Karur, Krishnagiri, Madurai, Nagpatinam, Pudikkottai, Perambalur, Ramnathpuram, Salem, Shивganga, Thanjavur, Theni, Tirupur, Trichy, Vellore, Tivallur, Tiruvarur, Tuticorin, Villipuram, Virudhanagr
23.	Telangana	Adilabad, Hyderabad, Karimnagar, Khammam, Mahbubnagar, Medak, Nalgonda, Nizamabad, Ranga Reddy, Warangal
24.	Uttar Pradesh	Agra, Aligarh, Amroha, Allahabad, Azamgarh, Ballia, Banda, Basti, Badaun, Bulandshahr, Chandauli, Deoria, Etah, Farrukhabad, Fatehpur, Firozabad, Gautam Budhnagar, Ghaziabad, Gazipur, Hamirpur, Hardoi, Hathras, J.P.Nagar, Jalaun, Jhansi, Kanpur Dehat, Kanpur Nagar, Kasganj, Kausambi, Lalitpur, Lucknow, Mahoba, Manipuri, Mathura, Mirzapur, Muzaffarnagar, Pratapgarh, Rai Bareilly, Rampur, Sambhal, Shamli, Siddharth Nagar, Unnao, Varanasi
25.	Uttarakhand	Almora, Haridwar, Uttarkashi
26.	W. Bengal	Alipurduar, Bankura, Birbhum, Cooch Behar, Darjeeling, Hooghly, Jalpaiguri, Murshidabad, Nadia, Paschim Bardhaman, Purba Bardhaman, Purulia, South 24 Parganas

Table-7.4.3: Comparative Change in number of Districts having Nitrate > 45 mg/L in various states

S. No.	State	Nos. of districts having NO ₃ > 45 mg/L.		
		2015	2022	Increase/ Decrease
1.	Andhra Pradesh	13	13	0
2.	Bihar	22	06	-16
3.	Chhattisgarh	09	20	11
4.	Delhi	08	04	-4
5.	Gujarat	23	29	6
6.	Goa	0	1	1

S. No.	State	Nos. of districts having NO ₃ > 45 mg/L.		
		2015	2022	Increase/ Decrease
7.	DNH	0	1	1
8.	Haryana	11	17	6
9.	Himachal Pradesh	03	04	1
10.	Jammu & Kashmir	05	08	3
11.	Jharkhand	13	13	0
12.	Karnataka	23	27	4
13.	Kerala	12	13	1
14.	Maharashtra	30	30	0
15.	Madhya Pradesh	36	45	9
16.	Nagaland	0	1	1
17.	Pondicherry	0	2	2
18.	Odisha	28	23	-5
19.	Punjab	10	20	10
20.	Rajasthan	33	34	1
21.	Tamil Nadu	15	35	20
22.	Telangana	10	10	0
23.	Uttar Pradesh	31	47	16
24.	Uttarakhand	02	03	1
25.	West Bengal	0	13	13
	Total	337	419	82

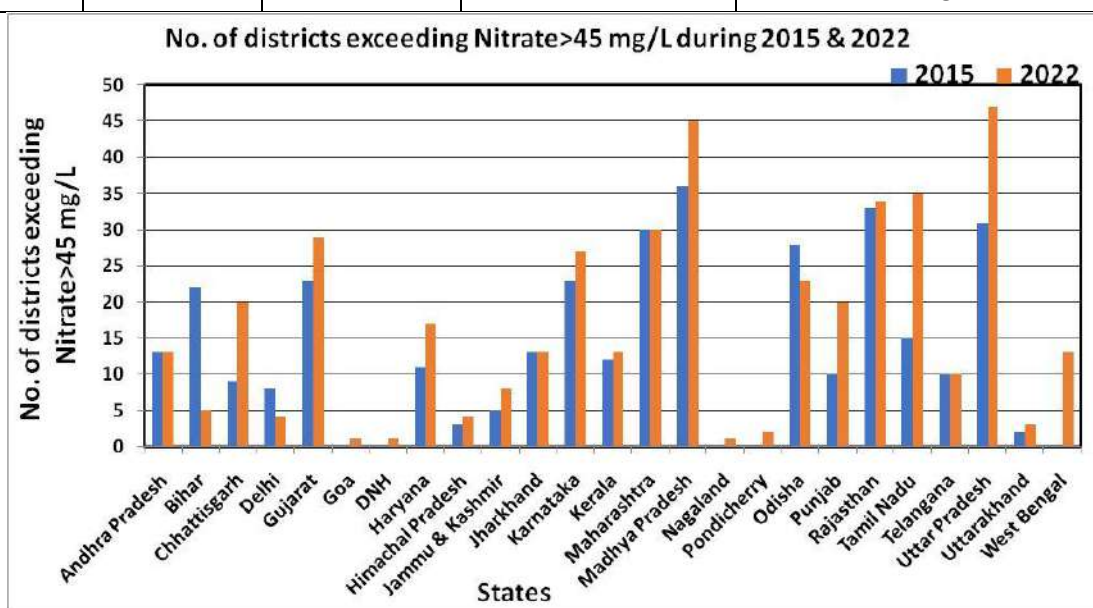


Fig. 7.4.3 Bar diagram comparing no. of Nitrate contaminated (45 mg/L) districts in

various state during year 2015 and 2022

It has been observed (Table 7.4.3) that No. of districts in various States having high Nitrate (more than 45 mg/l) content in ground water has increased by 24.33% in year 2022 as compared to the data available in year 2015.

7.4.1 TREND ON NITRATE

Trend analysis determines whether the measured values of the water quality variables increase or decrease during a time period. Nitrate is one of the major indicators of anthropogenic sources of pollution. Nitrate is the ultimate oxidized product of all nitrogen containing matter and its occurrence in groundwater can be fairly attributed to infiltration of water through soil containing domestic waste, animal waste, fertilizer and industrial pollution. As the lithogenic sources of nitrogen are very rare, its presence in ground water is almost due to anthropogenic activity. Hence, nitrate was taken to assess the trend of ground water quality in India due to anthropogenic activity. The percentage of well exceeds the permissible limit of 45mg/L for the period of 2017 to 2022 were compared and presented in the Table 7.4.4 and Fig 7.4.4 and observed that the percentage of samples exceed the permissible limit of nitrate (> 45 mg/L) were ranging between 20 - 25 % and no significant trend was noticed. The number of wells monitored in the year 2020 and 2022 was comparatively less due to COVID pandemic situation. The number of nitrate affected district has increased in the year 2022 as a greater number of piezometer/deeper wells was included in the monitoring wells after 2019. The percentage of wells affected by nitrate was comparatively more (25%) in the year 2020 and the sampling was more in residential area of the city and town limits during 2020. It is also observed that the type of waste generated is important in causing the nitrate pollution and also indicates that domestic waste leads to more nitrate problem. This could be due to the leaching of nitrate from the open sewerage lines. Trend on water quality for Nitrate prepared for the state of Tamil Nadu is showing a similar pattern (Fig 7.4.5).

Table 7.4.5: Percentage of wells Exceed Nitrate >1.5 mg/L during the period of 2017-2022

Year	Total Number of samples analysed	No. of districts affected by Nitrate	No. of locations affected by Nitrate	% age of samples affected by Nitrate (NO ₃ >45 mg/L)
2017	13028	359	2812	21.6
2018	13205	323	2569	19.5
2019	12503	352	2476	19.8
2020	6284	223	1574	25.0
2021	8427	257	1761	20.9
2022	15507	419	3348	21.6

Trend on Nitrate in a district, Tirunelveli and Cuddalore of Tamil Nadu is shown (Fig 7.4.6 and 7.4.7) and observed that the water level is deeper in Tirunelveli district as nitrate is mainly from anthropogenic activity, its influence is minimum in the deeper and shows decreasing trend. The

water level is shallow in cuddalore district as the influence of nitrate is more in shallow aquifer and shows increasing trend.

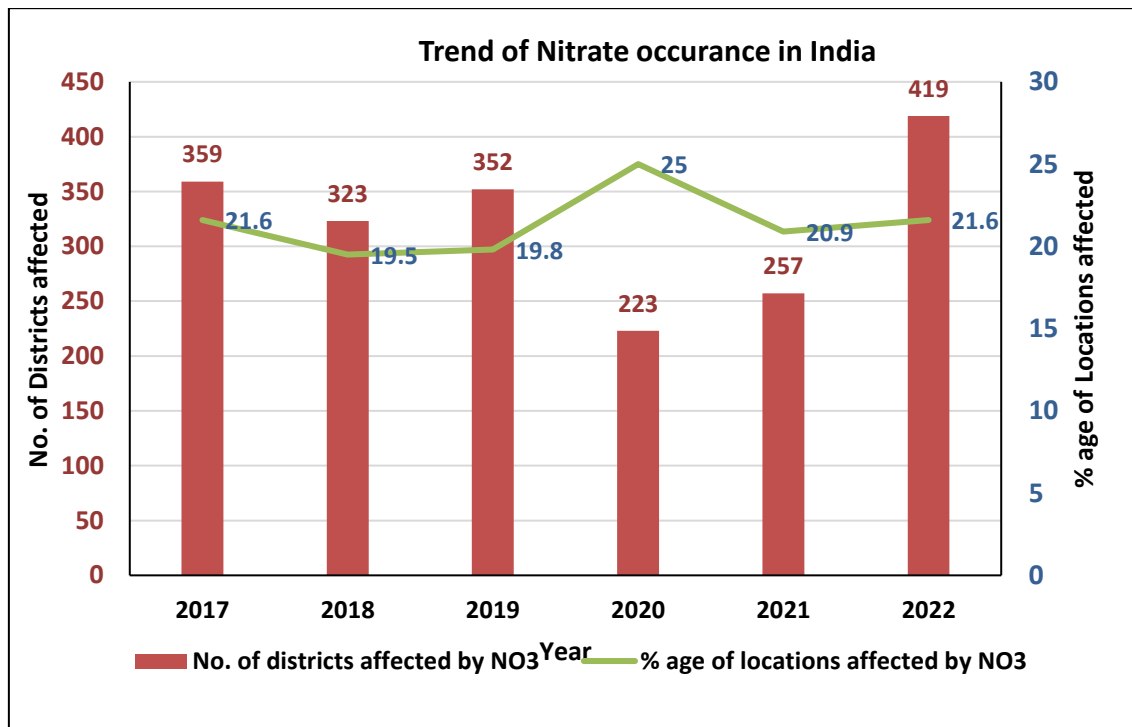
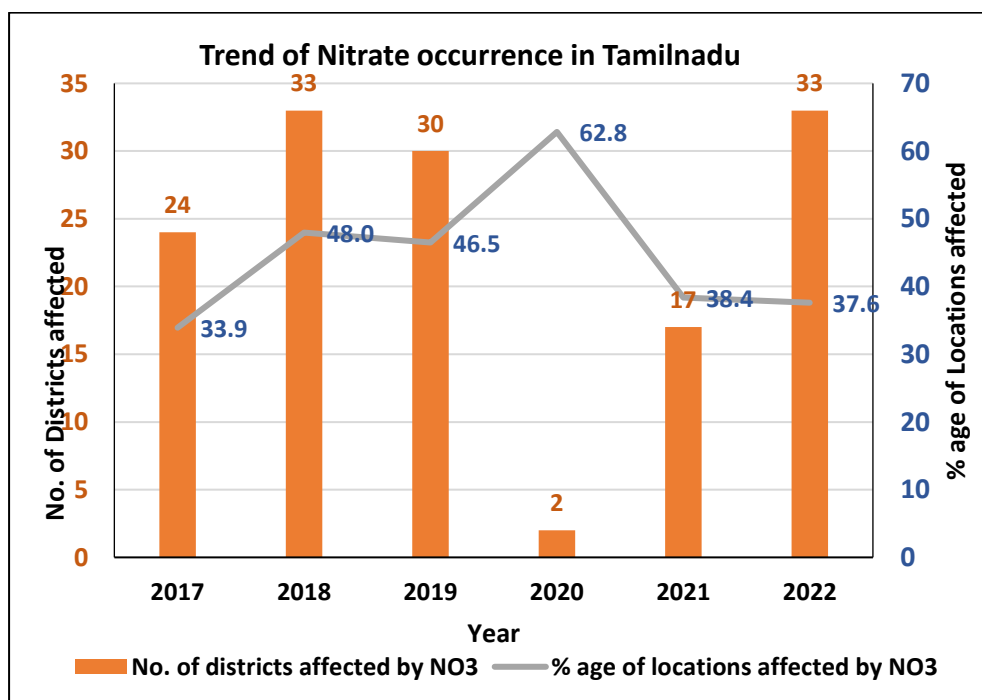


Fig. 7.4.4 Trend of Nitrate occurrence in India



. Fig. 7.4.5 Trend of Nitrate occurrence in Tamil Nadu

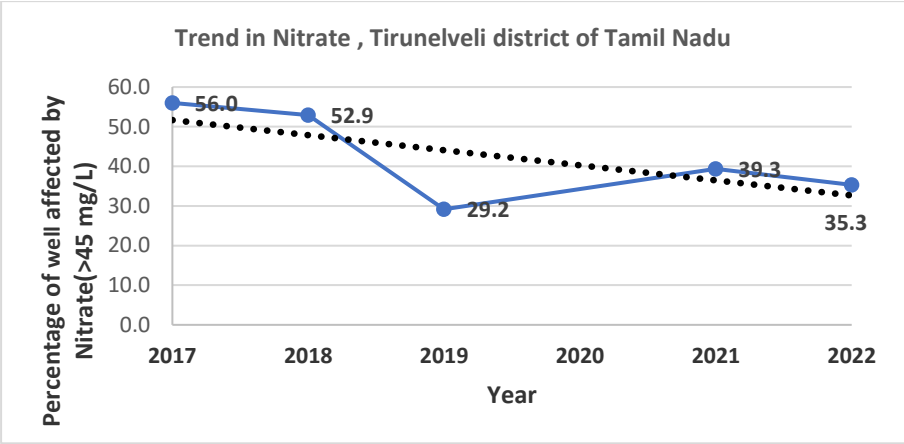


Fig 7.4.6 Trend on Nitrate in a district (Tirunelveli of Tamil Nadu) for the period of 2017-2022

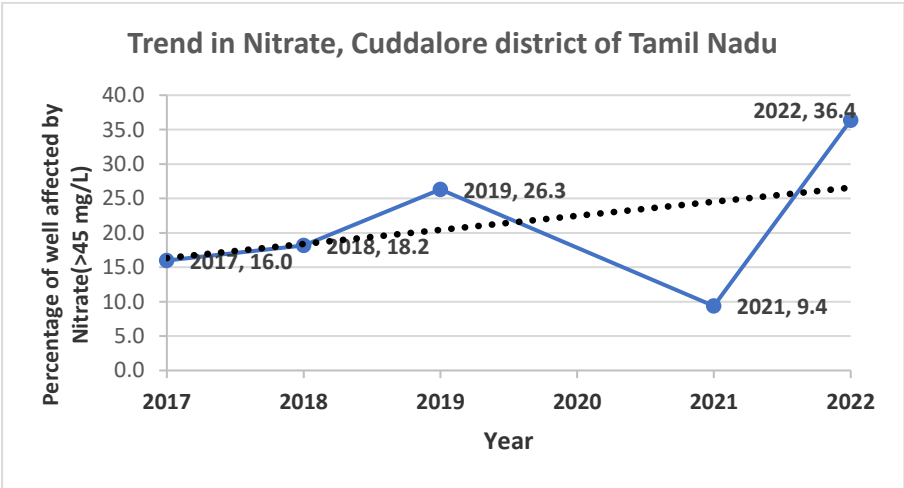


Fig 7.4.7 Trend on Nitrate in a district (Cuddalore) of Tamil Nadu) for the period of 2017-2022

Remedial Measures for Nitrate

For removal of nitrate both non-treatment techniques like blending and treatment processes such as ion-exchange, reverse osmosis, biological denitrification and chemical reduction are useful. The most important thing is that neither of these methods is completely effective in removing all the nitrogen from the water.

a) Methods involving no treatment: In order to use any of these options the nitrate problem must be local-scale. Common methods are –

- Raw water source substitution
- Blending with low nitrate waters

This greatly reduces expenses and helps to provide safer drinking water to larger numbers of people.

b) Methods involving Treatment:

They are as follows

- Adsorption/Ion Exchange
- Reverse Osmosis
- Electrodialysis
- Bio-chemical Denitrification (By using denitrifying bacteria and microbes)
- Catalytic Reduction/Denitrification (using hydrogen gas)

The mechanism of nitrate pollution in subsurface porous unconfined/confined aquifer is governed by complex biogeochemical processes. Apart from recharge conditions, groundwater chemistry may be impacted by the mineral kinetics of water-rock interactions. Consequently, suitable nitrate removal technologies should be selected. Nitrate is a very soluble ion with limited potential for co-precipitation or adsorption. This makes it difficult such as chemical coagulation, lime softening and filtration which are commonly used for removing most of the chemical pollutants such as fluoride, arsenic and heavy metals. According to King et al., 2012 nitrate treatment technologies can be classified in two categories in two categories, i.e. nitrate reduction and nitrate removal options. Nitrate removal technologies involve physical processes that does not necessarily involve any alteration of the chemical state of nitrate ions. Bio-chemical reduction options aim to reduce nitrate ions to other states of nitrogen, e.g. ammonia, or a more innocuous form as nitrogen gas. In-situ bioremediation is also effectively used in used in nitrate treatment of contaminated groundwater. Reverse Osmosis, catalytic reduction and blending are effective methods for nitrate removal from groundwater. For nitrate removal, operating trans-membrane pressure of RO unit generally ranges from 20 to 100 bar.

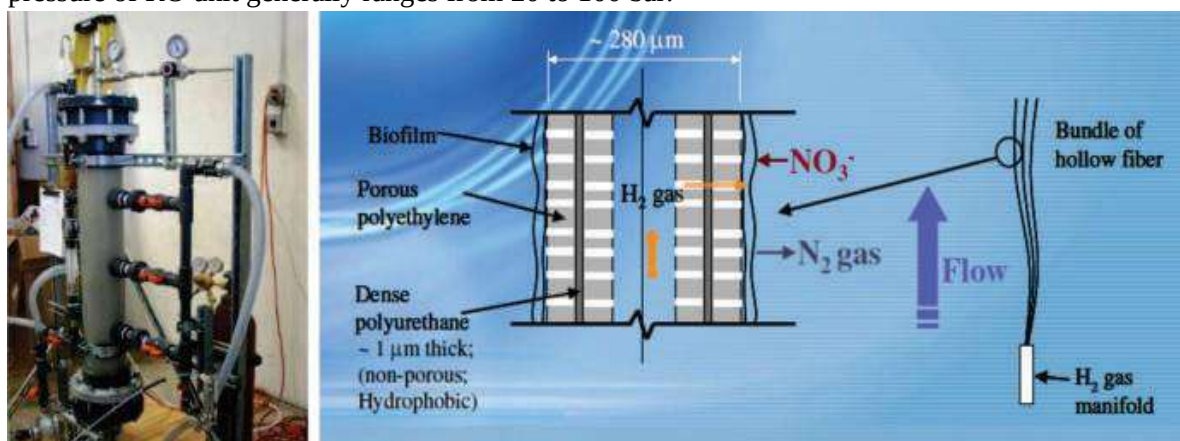


Fig. 7.4.8 Advanced Nitrate Reduction Hollow Fiber Membrane Reactor (Source: Hand Book for Drinking Water Treatment, JJM, Ministry of Jal Shakti, Gov. of India)

7.5 IRON

Iron is a common constituent in soil and ground water. It is present in water either as soluble ferrous iron or the insoluble ferric iron. Water containing ferrous iron is clear and colorless because the iron is completely dissolved. When exposed to air, the water turns cloudy due to oxidation of ferrous iron into reddish brown ferric oxide.

The concentration of iron in natural water is controlled by both physico-chemical and microbiological factors. It is contributed to groundwater mainly from weathering of ferruginous minerals of igneous rocks such as hematite, magnetite and sulphide ores of sedimentary and metamorphic rocks.

The permissible Iron concentration in ground water is 1.0 mg/L as per the BIS Standard for drinking water. The occurrences of iron in ground water beyond permissible limit (> 1.0 mg /litre) have been shown on the maps as point sources (Fig 7.5.1). It is based on the chemical analysis of water samples mostly collected from the groundwater observation wells/ springs/ hand pumps. The details of the sampling sources are given in Annexure-V. The iron point value map indicates Northern and Central India having more iron content in groundwater compare to Western Indian part. The most iron affected States are Bihar, Chhattisgarh, Jharkhand, Odisha, Uttar Pradesh and West Bengal.

The summary list of districts in which iron in ground water is found to exceed the permissible limits for drinking water in localized areas is shown in table 7.5.1.

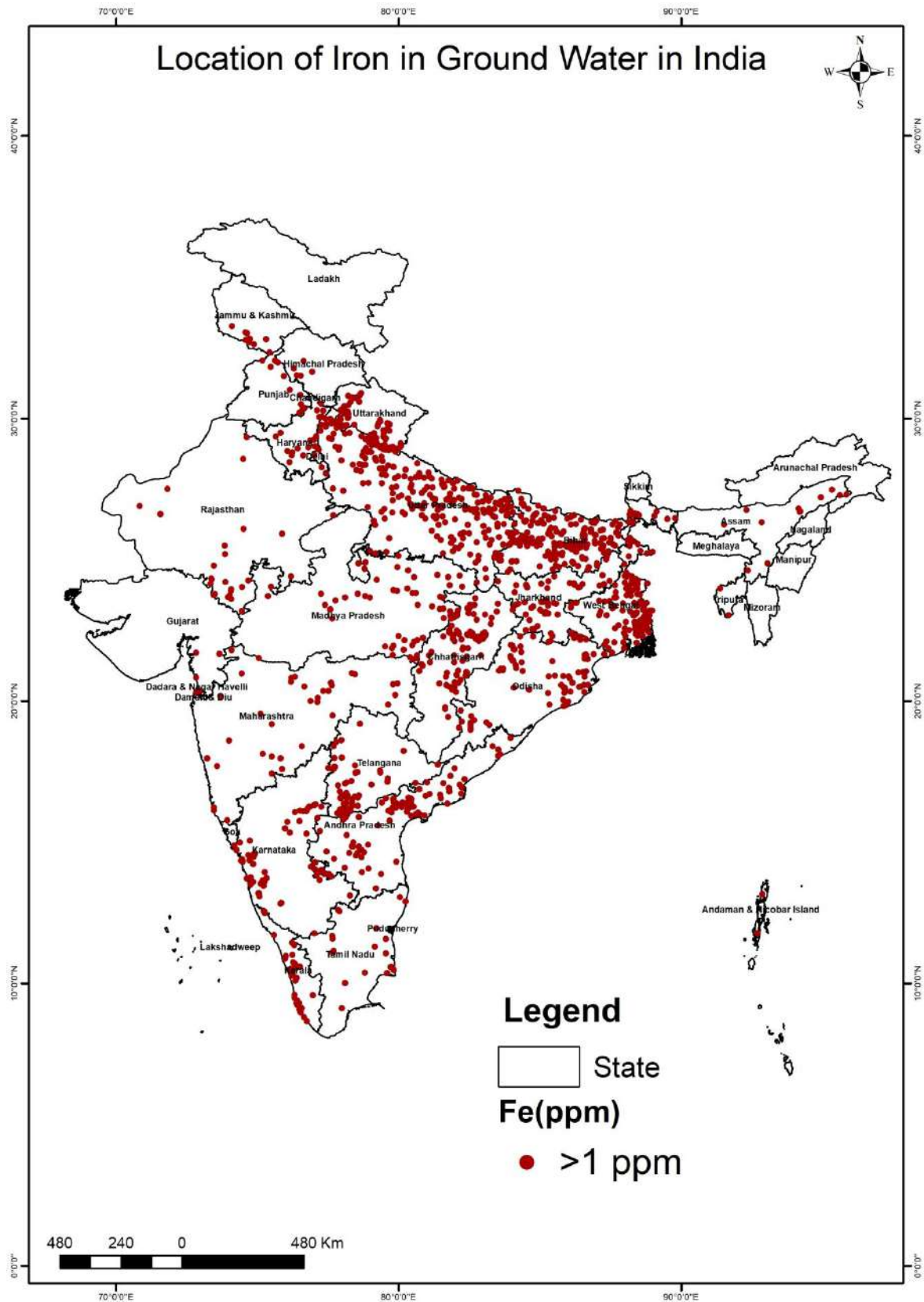


Fig 7.5.1 Map showing areas of Iron contaminated ($> 1.0\text{mg/L}$) groundwater in India (NHS 2019-20)

Table 7.5.1 Districts Having Localized Occurrence of Iron (>1.0 mg/L) in Ground Water in India

Sl. No	State	Parts of Districts Having Fe > 1.0 mg/L
1	Andaman And Nicobar	North & Middle Andaman, South Andaman
2	Andhra Pradesh	Ananthapur, Chittoor, East Godavari, Guntur, Kadapa, Krishna, Kurnool, Nellore, Prakasam, Srikakulam, Vizianagaram, West Godavari
3	Assam	Cachar, Dibrugarh, Jorhat, Kamrup, Karimganj, Nagaon, Sibsagar, Sonitpur, Tinsukia, Udalguri
4	Bihar	Patna, Begusarai, Khagaria, Saharsa, Madhepura, Gaya, Patna, Nawada, Nalanda, Seikhpura, Araria, Purnea, Katihar, Kishanganj, Muzaffarpur, E Champaran, W. Champaran, Gopalganj, Saran, Siwan, Bhojpur, Rohtas, Bhabua, Buxar, Banka, Munger, Jamui, Bhagalpur, Lakhisarai, Madhubani, Sitamarhi, Supaul, Sheohar, Samastipur, Vaishali, Begusarai
5	Chhattisgarh	Balodabazar, Balrampur, Bastar, Bilaspur, Dhamtari, Durg, Gariyabandh, Kawardha, Kondagaon, Korba, Koriya, Mahasamund, Mungeli, Raipur, Rajnandgaon, Surajpur, Surguja
6	Delhi	Delhi
7	Gujarat	Bharuch, Navsari, Valsad
8	Haryana	Bharuch, Narmada, Navsari, Valsad, Ambala, Bhiwani, Faridabad, Hissar, Jhajjar, Palwal, Panipat, Rohtak, Sirsa, Sonipat, Yamuna Nagar
9	Himachal Pradesh	Hamirpur, Kangra, Mandi, Sirmour, Una
10	Jammu & Kashmir	Jammu, Kathua, Rajauri, Reasi, Samba, Udhampur
11	Jharkhand	Barwadih, Bokaro, Chatra, Deoghar, Dhanbad, Dumka, E. Singhbhum, Giridih, Godda, Gumla, Hazaribagh, Jamtara, Khunti, Koderma, Latehar, Lohardaga, Pakur, Palamu, Ramgarh, Ranchi, Sahibganj, Simdega, W Singhbhum
12	Karnataka	Chickmagalur, Dakshin Kannada, Hassan, Koppal, Raichur, Shimoga, Tumkur, Udipi, Uttar Kannada,
13	Kerala	Alappuzha, Ernakulam, Idukki, Kasarakode, Kollam, Kottayam, Kozhikode, Malappuram, Thrissur, Trivandrum
14	Madhya Pradesh	Alirajpur, Balaghat, Betul, Bhind, Bhopal, Burhanpur, Chhatarpur, Chhindwara, Damoh, Gwalior, Hoshangabad, Jabalpur, Katni

Sl. No	State	Parts of Districts Having Fe > 1.0 mg/L
		Khandwa, Mandla, Neemuch, Panna, Rewa, Sagar, Satna, Seoni, Shahdol, Sheopur, Shivpuri, Sidhi, Tikamgarh, Ujjain, Vidisha
15	Maharashtra	Ahmednagar, Beed, Buldhana, Chandrapur, Dhule, Gadchiroli, Latur, Nanded, Nandurbar, Nasik, Pune, Ratnagiri, Sindudurg, Solapur, Wardha, Wasim
16	Odisha	Balasore, Baragarh, Bhadrak, Cuttack, Dhenkanal, Jagatsinghpur, Jajpur, Jharsuguda, Kandhamal, Kendrapara, Keonjhar, Khordha, Koraput, Mayurbhanj, Nabarangpur, Nayagarh, Puri, Rayagada, Sambalpur, Sonepur, Sundargarh
17	Punjab	Gurdaspur, Hoshiarpur, Nawanshahar, Patiala, Ropar
18	Rajasthan	Ajmer, Banswara, Churu, Dhaulpur, Dungaarpur, Jaisalmer, Jhalawar, Pratapgarh, Rajsamand, Tonk, Udaipur
19	Tamilnadu	Coimbatore, Cuddalore, Erode, Kancheepuram, Krishnagiri, Madurai, Nagapattinam, Nilgiri, Pudukkottai, Thanjavur, Tuticorin, Villupuram
20	Telangana	Adilabad, Hyderabad, Mahabubnagar, Medak, Nalgonda, Nizamabad, Ranga Reddy, Warangal
21	Tripura	Dhalai, Gomti, South Tripura, West Tripura
22	Uttar Pradesh	Allahabad, Ambedkar Nagar, Auraiya, Azamgarh, Bahraich, Ballia, Balrampur, Banda, Barabanki, Bareilly, Basti, Bijnor, Budaun, Bulandshahar, Chandauli, Deoria, Etawah, Faizabad, Ghazipur, Gonda, Gorakhpur, Hamirpur, Hardoi, Hathras, Jalaun, Jaunpur, Jhansi, Kannauj, Kanpur, Dehat, Kanpur Nagar, Kasganj, Kushinagar, Lakhimpur Khiri, Lalitpur, Lucknow, Maharajganj, Mahoba, Mathura, Maunath Bhajan, Meerut, Mirzapur, Moradabad, Muzaffarnagar, Pilibhit, Pratapgarh, Rae Bareilly, Rampur, Saharanpur, Shrawasti, Siddharth Nagar, Sitapur, Sonbhadra, St Kabir Nagar, Sultanpur, Unnao
23	Uttarakhand	Udham Singh Nagar, Almora, Champawat, Dehradun, Haridwar, Nainital, Pauri, Garhwal, Uttarkashi
24	West Bengal	Alipurduar, Bankura, Bardhaman, Birbhum, Dakshin, Dinajpur, Darjeeling, Howrah, Hugli, Jalpaiguri, Kochbihar, Kolkata, Malda, Murshidabad, N24 Parganas, Nadia, Paschim, Medinipur, Purba, Medinipur, South 24 Parganas, Uttar Dinajpur

Table-7.5.2: Comparative Change in number of Districts having Fe > 1.0 mg/L in various states.

S. No.	State	No of Districts having Fe > 1.0 mg/L		
		2015	2019	Increase/Decrease
1	Andaman and Nicobar	1	02	1
2	Andhra Pradesh	13	10	-3
3	Arunachal Pradesh	2	01	-1
4	Assam	15	12	-3
5	Bihar	16	36	20
6	Chhattisgarh	10	17	7
7	Delhi	3	01	-2
8	Goa	2	02	0
9	Gujarat	13	03	-10
10	Haryana	14	15	1
11	Himachal Pradesh	-	05	5
12	Jammu & Kashmir	5	05	0
13	Jharkhand	9	23	14
14	Karnataka	18	10	-8
15	Kerala	12	10	-2
16	Madhya Pradesh	10	28	18
17	Maharashtra	21	16	-5
18	Manipur	2	02	0
19	Meghalaya	3	01	-2
20	Orissa	29	21	-8
21	Punjab	13	05	-8
22	Rajasthan	22	22	0
23	Tamilnadu	3	12	9
24	Telangana	7	08	1
25	Tripura	3	04	1
26	Uttar Pradesh	15	55	40
27	Uttrakhand	-	08	8
28	West Bengal	15	20	5
	Grand total	276	354	78

As compared to the data available in year 2015, the number of districts having Iron more than 1.0 mg/L in ground water samples has increased (Table 7.5.2) by 28.2 % during the year 2019.

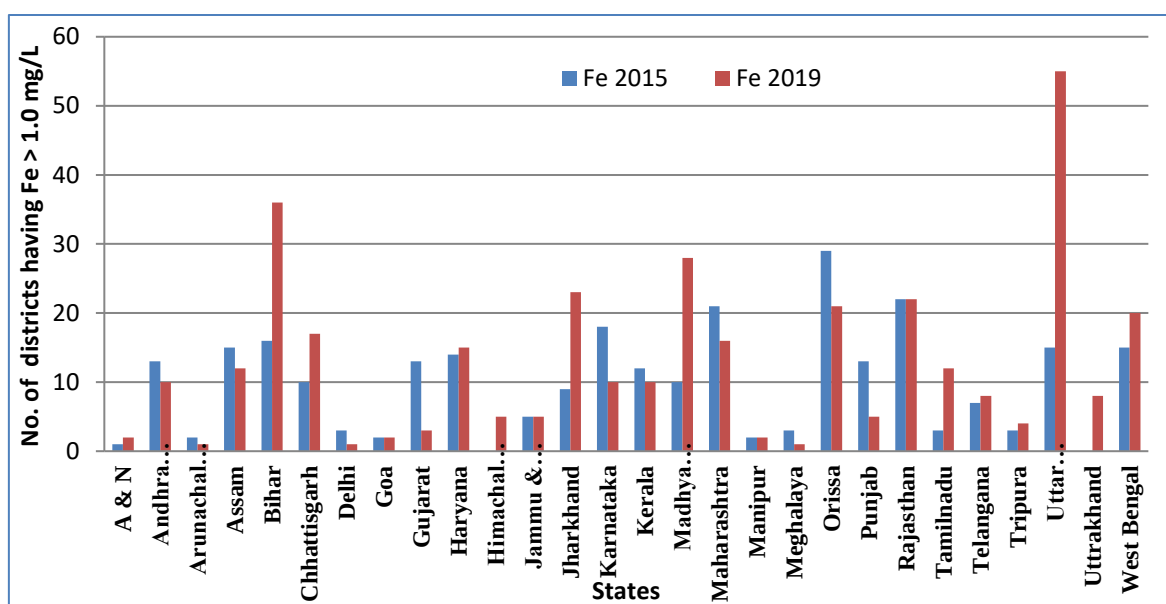


Fig. 7.5.2 Comparison on No of districts exceed Iron >1.0 mg/L during 2015 and 2019.

Remedial Measures for Iron/Manganese

a) **Oxidation and filtration:** Before iron and manganese can be filtered, they need to be oxidized to a state in which they can form insoluble complexes. Ferrous iron (Fe^{2+}) is oxidized to ferric iron (Fe^{3+}), which readily forms the insoluble iron hydroxide complex $\text{Fe}(\text{OH})_3$. Manganese (Mn^{2+}) is oxidized to (Mn^{4+}), which forms insoluble (MnO_2). The common chemical oxidants in water treatment are chlorine, chlorine dioxide, potassium permanganate and ozone. The dose of potassium permanganate, however, must be carefully controlled. Too little permanganate will not oxidize all the iron and manganese, and too much will allow permanganate to enter the distribution system and cause a pink color.

Ozone may be used for iron and manganese oxidation. Ozone may not be effective for oxidation in the presence of humic or fulvic materials. If not dosed carefully, ozone can oxidize reduced manganese to permanganate and result in pink water formation as well. Manganese dioxide particles, also formed by oxidation of reduced manganese, must be carefully coagulated to ensure their removal.

A low-cost method of providing oxidation is to use the oxygen in air as the oxidizing agent. Water is simply passed down a series of porous trays to provide contact between air and water. No chemical dosing is required. This method is not effective for water in which the iron is complexed with humic materials or other large organic molecules.

Oxidation and Filtration Method for Fe and Mn Removal from Ground Water In general, manganese oxidation is more difficult than iron because the reaction rate is slower. A longer detention time (10 to 30 minutes) following chemical addition is needed prior to filtration to allow the reaction to take place. Manganese greensand is by far the most common medium in use for removal of iron and manganese through pressure filtration. Greensand is a processed material consisting of nodular grains of the zeolite mineral glauconite. The material is coated with manganese oxide. The ion exchange properties of the glauconite facilitates the bonding of the coating. This treatment gives the media a catalytic effect in the chemical oxidation reduction

reactions necessary for iron and manganese removal. This coating is maintained through either continuous or intermittent feed of potassium permanganate.

Anthra/sand (also iron-man sand) are other types of media available for removal of iron and manganese. They consist of select anthracite and sand with a chemically bonded manganese oxide coating.

Electromedia is a proprietary multi-media formulation which uses a naturally occurring zeolite and does not require potassium permanganate regeneration. Finally, macrolite, is a manufactured ceramic material with a spherical shape and a rough, textured surface. The principal removal mechanism is physical straining rather than contact oxidation or adsorption. Each medium has its advantages and disadvantages. Selection of a medium and oxidant should be based on pilot testing in which all necessary design criteria can be determined.

b) Ion Exchange Ion exchange should be considered only for the removal of small quantities of iron and manganese because there is a risk of rapid clogging. Ion exchange involves the use of synthetic resins where a pre-saturate ion on the solid phase (the “adsorbent,” usually sodium) is exchanged for the unwanted ions in water. One of the major difficulties in using this method for controlling iron and manganese is that if any oxidation occurs during the process, the resulting precipitate can coat and foul the media. Cleaning would then be required using acid or sodium bisulfate.

c) Combined Photo-Electrochemical (CPE) Method Different processes, such as electrochemical (EC), photo (UV), and combined photo-electrochemical (CPE) methods are used. A cell containing aluminium electrode as anode, graphite electrode as cathode and UV lamp are used and filled with waste water enriched with iron and manganese as an electrolytic solution. A limited quantity of sodium chloride salt is added to enhance the electric conductivity through the solution. A comparison between different methods was undertaken to evaluate the applied conditions and the efficiency of Fe and Mn removal at different times and initial concentrations. The results revealed that CPE method was the best choice for the simultaneous removal of both iron and manganese in a short time < 10 min.

d) Sequestration is the addition of chemicals to groundwater aimed at controlling problems caused by iron and manganese without removing them. These chemicals are added to groundwater at the well head or at the pump intake before the water has a chance to come in contact with air or chlorine. If the water contains less than 1.0 mg/L iron and less than 0.3 mg/L manganese, using polyphosphates followed by chlorination can be an effective and inexpensive method for mitigating iron and manganese problems. No sludge is generated in this method. Below these concentrations, the polyphosphates combine with the iron and manganese preventing them from being oxidized. Any of the three polyphosphates (pyrophosphate, tripolyphosphate, or metaphosphate) can be used. Applying sodium silicate and chlorine simultaneously has also been used to sequester iron and manganese. However, while this technique is reliable in the case of iron treatment, it has not been found to be effective in manganese control.

7.6 ARSENIC

Arsenic is a naturally occurring trace element found in rocks, soils and the water in contact with them. Arsenic has been recognized as a toxic element and is considered a human health hazard.

The occurrence of Arsenic in ground water was first reported in 1980 in West Bengal in India. In West Bengal, 79 blocks in 8 districts have Arsenic beyond the permissible limit. The most affected areas are on the eastern side of Bhagirathi River in the districts of Malda, Murshidabad, Nadia, North 24 Parganas and South 24 Parganas and western side of the districts of Howrah, Hugli and Bardhaman. The occurrence of Arsenic in ground water is mainly in the aquifers upto 100 m depth. The deeper aquifers are free from Arsenic contamination.

Apart from West Bengal, Arsenic contamination in groundwater has been found in the states of Assam, Bihar, Chhattisgarh, Haryana, Jharkhand, Karnataka, Punjab, and Uttar Pradesh. The occurrence of Arsenic in the states of Bihar, West Bengal and Uttar Pradesh is in alluvial formations but in the state of Chhattisgarh, it is in the volcanic rocks exclusively confined to N-S trending Dongargarh-Kotri ancient rift zone. It has also been reported in Golaghat, Jorhat, Lakhimpur, Nagaon, Nalbari, Sibsagar, Sonitpur district of Assam.

The map showing distribution of Arsenic in ground water of India (Fig 7.6.1) has been generated from the data on arsenic concentration in water samples mostly collected from the groundwater observation wells/ hand pumps, Arsenic contaminated areas have been shown as points based on findings of Central Ground Water Board. The details of the locations are given in Annexure-VIII and locations exceed the limit of 0.01mg/L (10 ppb) are given in Annexure VI. The point sources are plotted on the map (Fig 7.6.1). Districts having Arsenic > 0.01 mg/L in Ground Water in Different States of India is shown in Table-7.6.1.

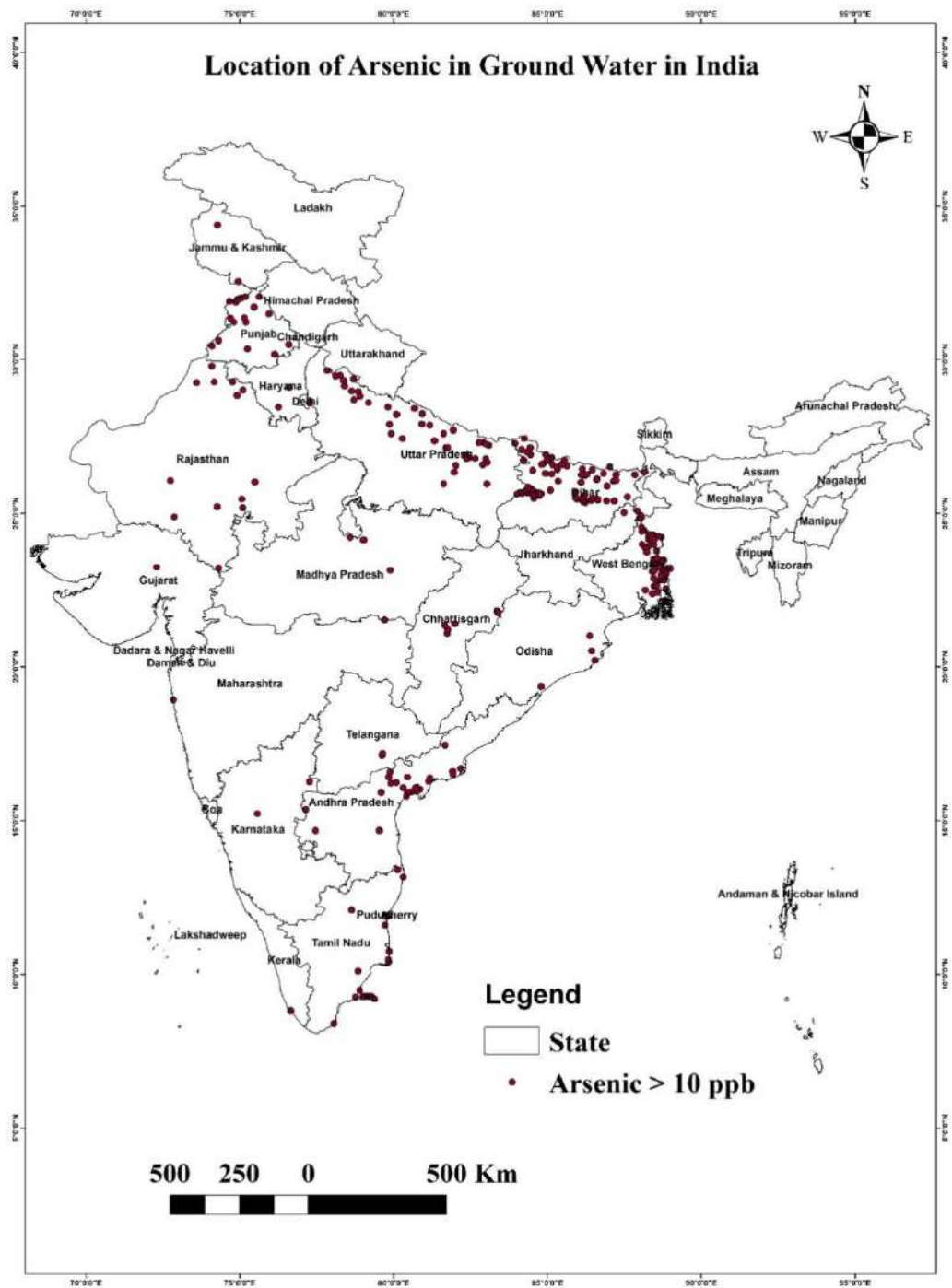


Fig 7.6.1 Map showing areas of Arsenic contaminated (> 10 ppb) groundwater in India (NHS 2019-20)

Table 7.6.1: Districts having Arsenic >0.01 in Ground Water in Different States of India

Sl. No.	State	Parts Of Districts having As > 10 ppb (0.01 mg/L)
1.	Andhra Pradesh	East Godavari, Guntur, Krishna, Kurnool, Nellore, Prakasam,
2.	Bihar	Araria, Begusarai, Bhagalpur, Bhojpur, Buxar, Darbhanga, E Champaran, Gopalganj, Katihar, Khagaria, Kishanganj, Madhepura, Madhubani, Muzaffarpur, Samastipur, Saran, Sheohar, Sitamarhi, Sheohar, Sitamarhi, Supaul, W. Champaran
3.	Chhattisgarh	Rajnandgaon, Raipur, Koriya
4.	Delhi	East, North East
5.	Gujarat	Mahesana,
6.	Haryana	Bhiwani, Sonipat
7.	Himachal Pradesh	Kangra
8.	Jammu & Kashmir	Kupwara, Samba
9.	Jharkhand	Sahibganj
10.	Karnataka	Raichur, Yadgir
11.	Kerala	Kollam
12.	Maharashtra	Bhandara, Mumbai City
13.	Madhya Pradesh	Datia, Morena,
14.	Odisha	Bhadrak, Ganjam, Jagatsinghpur, Kendrapara
15.	Punjab	Amritsar, Bathinda, Fazilka, Gurdaspur, Hoshiarpur, Kapurthala, Pathankot, Patiala, Sas Nagar, Tarn Taran,
16.	Rajasthan	Banswara, Bhilwara, Churu, Ganganagar, Hanumangarh, Jodhpur, Sirohi, Tonk,
17.	Tamil Nadu	Chennai, Cuddalore, Dharmapuri, Nagapattinam, Pondicherry, Ramanathapuram, Sivaganga, Tiruvallur, Tuticorin
18.	Telangana	Nalgonda
19.	Uttar Pradesh	Azamgarh, Bahraich, Ballia, Banda, Basti, Bijnor, Faizabad, Goda, Hardoi, Kushinagar, Lakhimpur Khiri, Moradabad, Muzaffarnagar, Pilibhit, Pratapgarh, Rampur, Shravasti, Sitapur, St. Kabir Nagar, Sultanpur
20.	Uttarakhand,	Udham Singh Nagar, Champawat, Dehradun, Haridwar
21.	West Bengal	Howrah, Hugli, Malda, Murshidabad, N24 Parganas, Nadia, South 24 Parganas

Remedial Measures for Arsenic

a) Precipitation processes- includes coagulation/filtration, direct filtration, coagulation assisted microfiltration, enhanced coagulation, lime softening, and enhanced lime softening. Adsorption co-precipitation with hydrolyzing metals such as Al^{3+} and Fe^{3+} is the most common treatment

technique for removing arsenic from water. Sedimentation followed by rapid sand filtration or direct filtration or microfiltration is used to remove the precipitate. Coagulation with iron and aluminium salts and lime softening is the most effective treatment process. To improve efficiency of this method, a priory oxidation of As (III) to As (V) is advisable. Hypochlorite and permanganate are commonly used for the oxidation. Atmospheric oxygen can also be used, but the reaction is very slow. The major techniques based on this process include; Bucket treatment unit, Fill and draw treatment unit, Tubewell-attached arsenic treatment unit and Iron arsenic treatment unit.

b) Adsorptive processes- Adsorption on to activated alumina, activated carbon and iron/manganese oxide based or coated filter media. Adsorptive processes involve the passage of water through a contact bed where arsenic is removed by surface chemical reactions. The activated alumina-based sorptive media are being used in Bangladesh and India. No chemicals are added during treatment and the process relies mainly on the active surface of the media for adsorption. Granular ferric hydroxide is a highly effective adsorbent used for the adsorptive removal of arsenate, arsenite, and phosphorous from natural water. In the Sono 3-Kolshi filter, used in Bangladesh and India zero valent iron fillings, sand, brick chips and wood coke are used as adsorbent to remove arsenic and other trace elements from groundwater.

c) Ion-exchange processes- This is similar to that of activated alumina, however, in this method the medium is synthetic resin of relatively well-defined ion exchange capacity. In these processes, ions held electrostatically on the surface of a solid phase are exchanged for ions of similar charge dissolved in water. Usually, a synthetic anion exchange resin is used as a solid. Ion exchange removes only negatively charged As (V) species. If As (III) is present, it is necessary to oxidise it.

d) Membrane processes- This includes nano-filtration, ultrafiltration, reverse osmosis and electrodialysis in which synthetic membranes are used for removal of many contaminants including arsenic. They remove arsenic through filtration, electric repulsion, and adsorption of arsenic-bearing compounds.

e) Arsenic safe alternate aquifers

This technique advocates tapping of safe alternate aquifers right within the affected areas. In India except at Rajnandgaon in Chhattisgarh state, the vast affected areas in the Gangetic Plains covering Bihar and Uttar Pradesh as well as Deltaic Plains in West Bengal is marked by multiaquifer system. The sedimentary sequence is made up Quaternary deposits, where the aquifers made up of unconsolidated sands which are separated by clay/sandy clay, making the deeper aquifer/aquifers semi-confined to confined. The contamination is confined in the upper slice of the sediments, within 80 m and affecting the shallow aquifer system. At places, like Maldah district of West Bengal single aquifer exists till the bed rock is encountered at 70-120 m bgl.

Detailed CGWB exploration, isotope and hydro-chemical modeling carried out by CGWB along with other agencies like BARC has indicated that the deep aquifers (>100 m bgl) underneath the contaminated shallow aquifer, have been normally found as arsenic free. Long duration pumping tests and isotopic studies in West Bengal and Bihar have indicated that there is limited hydraulic

connection between the contaminated shallow and contamination free deep aquifers and the ground water belong to different age groups having different recharge mechanisms. The deep aquifers in West Bengal, Bihar and Uttar Pradesh have the potential to be used for community-based water supply.

7.7 URANIUM

Uranium occurs naturally in groundwater and surface water. Being a radioactive mineral, high uranium concentration can cause impact on water, soil and health. Uranium has both natural and anthropogenic source that could lead to the aquifer. These sources include leaching from natural deposits, release in mill tailings, and emissions from the nuclear industry, combustion of coal and other fuels and the use of phosphate fertilizers that contains uranium and contribute to ground water pollution. Uranium enters in human tissues mainly through drinking water, food, air and other occupational and accidental exposures. Intake of uranium through air and water is normally low, but in circumstances in which uranium is present in a drinking water source, the majority of intake can be through drinking water.

Water with uranium concentration above the recommended maximum permissible concentration of 30 ppb (BIS,10500:2012) is not safe for drinking purposes as it can cause damage to internal organs, on continuous intake. Elevated uranium concentrations in drinking water have been associated with many epidemiological studies such as urinary track cancer as well as kidney toxicity. A recent study, found a strong correlation between uranium concentration in drinking water and uranium in bone, suggesting that bones are good indicators of uranium exposed via ingestion of drinking water. Therefore, such studies trigger further assessment of uranium's adverse health effects on humans and/or the environment for countries where elevated uranium concentration in drinking water has been observed. Hence, it becomes important to study the level of uranium in drinking water for health risk assessment.

Uranium concentration in the shallow ground water varies primarily due to recharge and discharge, which would have dissolved or leached the uranium from the weathered soil to groundwater zone. High uranium concentrations observed in groundwater may be due to local geology, anthropogenic activities, urbanization and use of phosphate fertilizers in huge quantity for agriculture purpose. Studies have shown that phosphate fertilizer possess uranium concentration ranging from 1 mg/kg to 68.5 mg/kg (Brindha K et al., 2011). Hence, the phosphate fertilizers manufactured from phosphate rocks may also contribute uranium to ground water in agriculture region. In ores, uranium is found as uranite (UO_2^{2+}) and pitchblende ($\text{U}_3\text{O}_8^{2+}$) or in the form of secondary minerals (complex oxides, silicates, phosphates, vanadates).

Table 7.7.1 Summary of uranium concentrations in different types of rocks

Rocks	Range(mg/kg)
Granite	3.4
Limestone/dolomite	2.2
Argillaceous shale	3.7
Sediments	1.4-53
Phosphates	30-100

Table 7.7.2 Standards and guidelines for uranium in drinking water in various countries.

Sl. No	Country / agency	guideline value (µg/L)	Reference
1	Australia	GV 17	NHMRC, Australia (2011)
2	Bulgaria	ML 60	European Food Safety Authority (2009)
3	Canada	MAC 20	Health Canada (2019)
4	Finland	RV 100	European Food Safety Authority (2009)
5	India	RBL 60	AERB, India (2004)
6	India	PL 30	BIS,2012
7	Malaysia	MAV 2	Ministry of Health Malaysia (2004)
8	USA	MCL 30	USEPA (2011)
9	WHO	PGV 30	WHO 2011

GV, Guideline value; ML, Maximum limit; MAC, Most acceptable concentration; RV, Recommended value; RBL, Radiological based limit; PL, Permissible Limit; MAV, Maximum acceptable value; MCL, Maximum contaminant level; PGV, Provisional guideline value

To assess the Uranium concentration and distribution in the ground water, Central Ground Water Board (CGWB) had decided to carry out Uranium sampling of its National Hydrograph Network Stations (NHNS) in the entire country during Pre-monsoon monitoring (May,2019). The sample collection and storage were done according to the standard protocols prescribed by APHA (2017). The groundwater samples were collected in plastic bottles after having been filtered through 0.45-µm filter paper. For the cations and uranium analyses, groundwater samples were immediately acidified below pH 2 by adding nitric acid to prevent precipitation and adsorption to the container walls. Uranium (U) was detected using Inductively Coupled Plasma Mass-spectrometry. To ensure quality control, duplicate and standard checks were performed on every ten samples. In addition, a trace element standard reference material was examined. State wise no. of districts affected by Uranium (>30 ppb) and maximum value observed is given in Table 7.7.4.

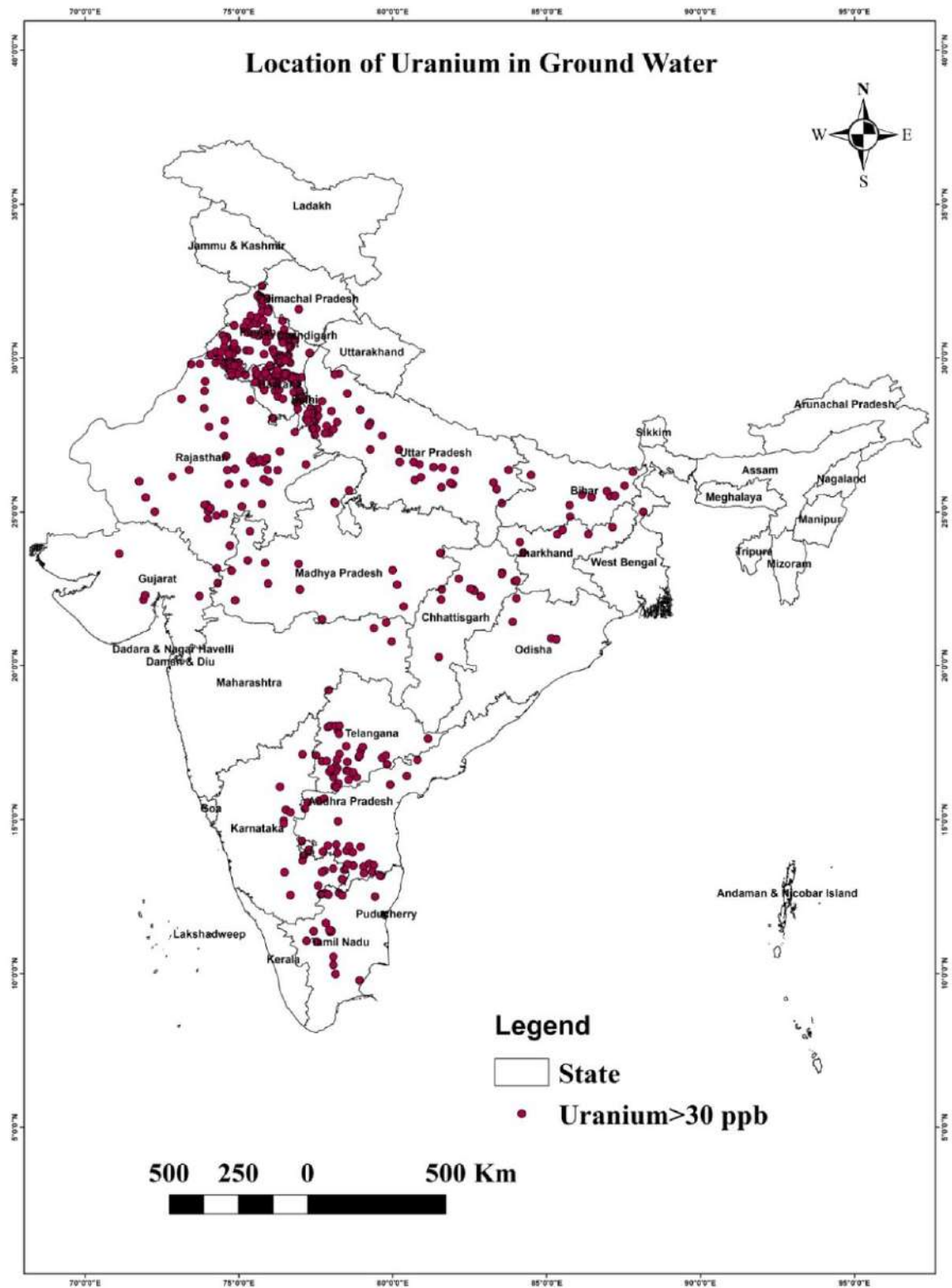


Fig 7.7.1 Map showing areas of Uranium contaminated (> 30 ppb) groundwater in India (NHS 2019-20)

Table 7.7.3: Districts Having Uranium >0.03 mg/L (>30ppb) in Ground Water in Different States of India

Sl No	State	Districts Partly affected with Uranium > 30ppb
1	Andhra Pradesh	Ananthapur, Chittoor, Guntur, Kadapa, East Godavari, Krishna, Kurnool, Prakasam
2	Bihar	Saran, Bhabhua, Khagaria, Madhepura, Nawada, Sheikhpura, Purnea, Kisanganj, Begusarai
3	Chhattisgarh	Bilaspur, Jashpur, Kanker, Korba
4	Delhi	North West District, South West District, West District, North District
5	Gujrat	Dohad, Ahmedabad, Vadodara, Patan
6	Haryana	Ambala, Bhiwani, Faridabad, Fatehabad, Gurugram, Hissar, Jhajjar, Jind, Kaithal, Karnal, Kurukshetra, Mahendergarh, Palwal, Panipat, Rohtak, Sirsa, Sonipat, Yamuna Nagar
7	Himachal Pradesh	Mandi
8	Jharkhand	Godda, Koderma, Latehar, Palamau
9	Karnataka	Bangalore Rural, Bangalore Urban, Bellary, Gulbarga, Kolar, Mandya, Raichur, Tumkur
10	Madhya Pradesh	Balaghat, Betul, Chhatarpur, Datia, Gwalior, Jhabua, Panna, Raisen, Seoni, Shivpuri
11	Maharashtra	Bhandara, Gondia, Nagpur
12	Odisha	Angul, Dhenkanal, Sundargarh, Sambalpur
13	Punjab	Bathinda, Moga, Faridkot, Fatehgarh Sahib, Fazilka, Ferozepur, Hoshiarpur, Jalandhar, Kapurthala, Ropar, Ludhiana, Muktsar, Pathankot, Patiala, Sangrur, SAS Nagar
14	Rajasthan	Ajmer, Alwar, Banswara, Barmer, Bhilwara, Bikaner, Bundi, Chittaurgarh, Churu, Dausa, Ganganagar, Jaipur, Jalore, Jodhpur, Karauli, Nagaur, Pratapgarh, Rajsamand, Sawai Madhopur, Tonk, Udaipur
15	Tamil Nadu	Dindigul, Erode, Krishnagiri, Madurai, Mamakkal, Ramnathapuram, Salem, Thiruvannamalai, Tirupur, Tiruvallur
16	Telangana	Adilabad, Hyderabad, Mahabubnagar, Medak, Nalgonda, Ranga Reddy
17	Uttar Pradesh	Aligarh, Azamgarh, Bijnaur, Badaun, Bulandshaher, Deoria, Farrihabad, Fatehpur, G.B. Nagar, Ghaziabad, Ghazipur, Hardoi, Hathras, J P Nagar, Kanpur Nagar, Mainpuri, Mathura, Pratapgarh, Raebareilly, Sultanpur, Unnao.
18	West Bengal	Malda

Table 7.7.4 shows the number of districts partly affected in various states with maximum values recorded. It is observed that Punjab, Haryana, Telangana, Rajasthan, Andhra Pradesh and Uttar Pradesh are mostly affected in terms of percentage of samples observed with U concentration > 30 ppb. Some other states such as Karnataka, Madhya Pradesh, Tamilnadu, Jharkhand, Chhattisgarh, Gujrat, Himachal Pradesh, Maharashtra, and Bihar have also been observed to have Uranium concentration above the permissible level of 30 µg/L in some localized pockets.

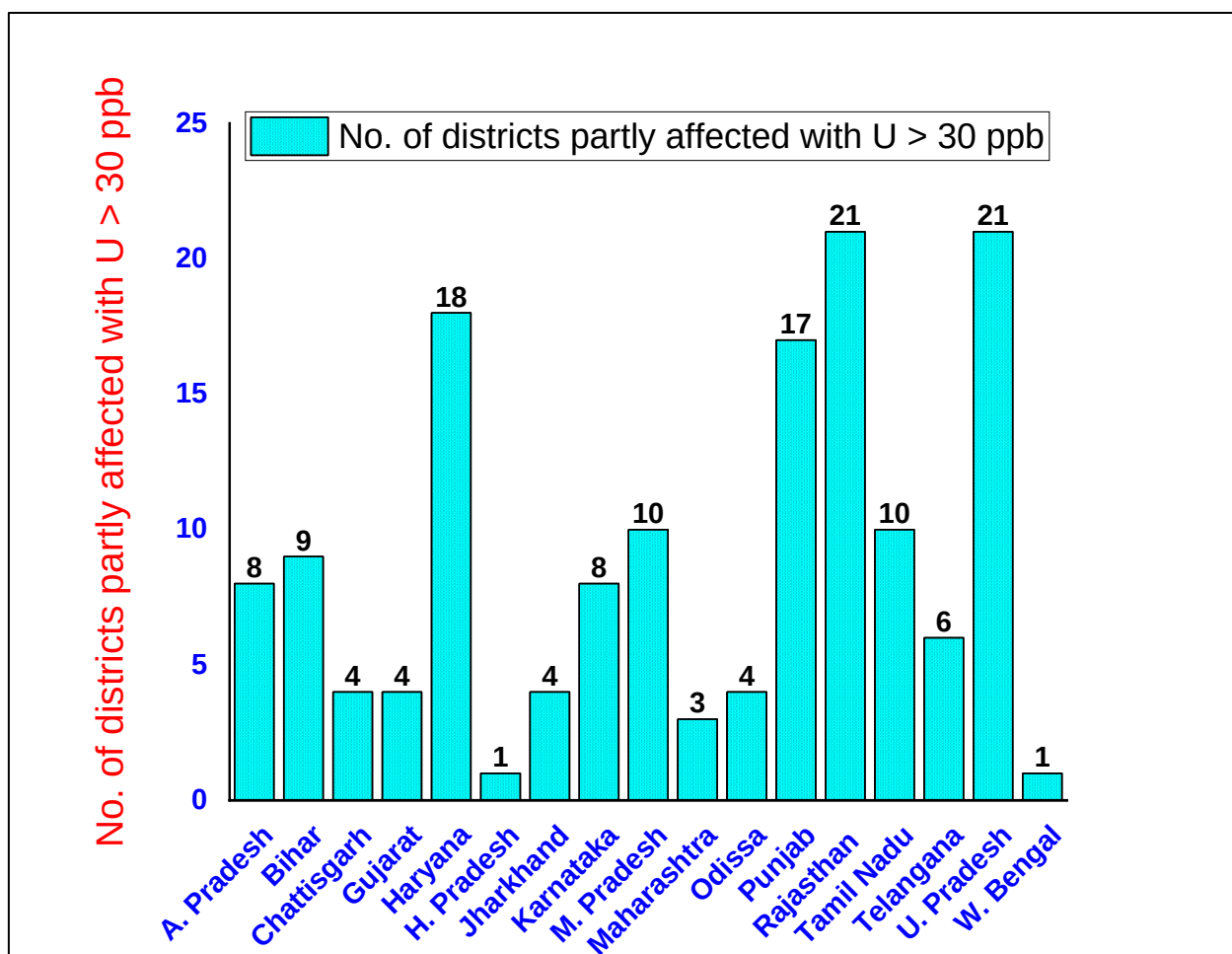


Fig. 7.7.2 Bar diagram displaying no. of partly Uranium contaminated (> 30 ppb) districts in various state during 2019.

Uranium concentration varied from 0.0 to 2876 ppb in the entire country during Pre-monsoon monitoring (May, 2019), indicating that uranium concentrations in groundwater widely vary by several orders of magnitude. Large variations seen in Uranium concentrations could be due to the wide variation of geographical locations or regional differences in the hydrogeochemical characteristics of groundwater.

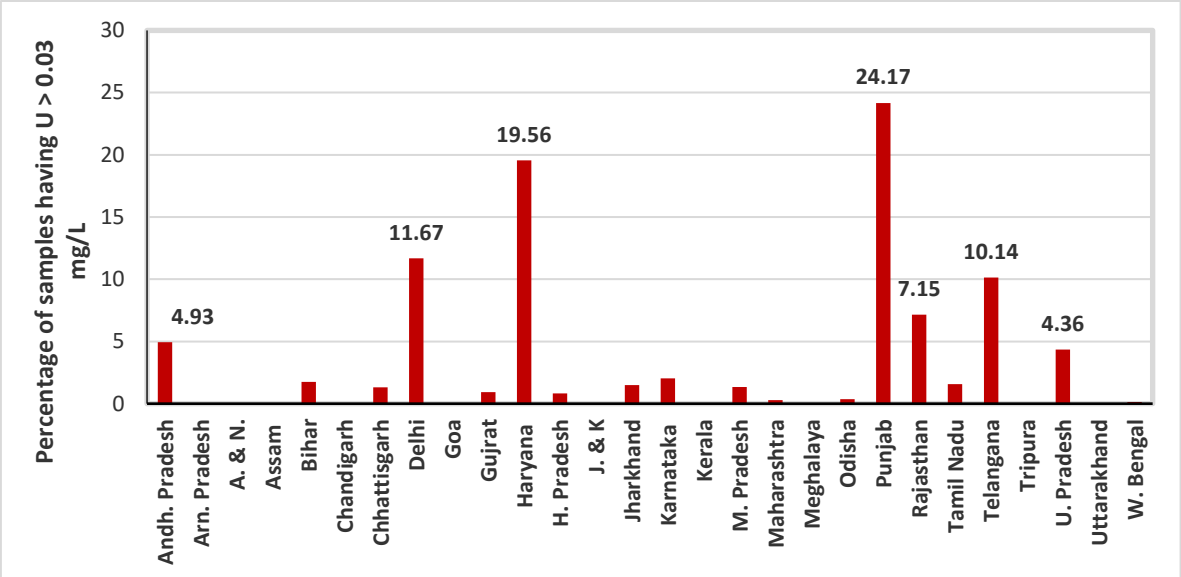


Fig 7.7.3 State-wise percentage of samples exceed Uranium 0.03mg/L (>30ppb)

Table 7.7.4 Details of number of districts partly affected with Uranium > 0.03 mg/L (>30ppb) and the maximum values of Uranium in various states/UT of India

Sl. No.	State/UT	No. of districts partly affected with U > 30 ppb (2019)	Maximum value of Uranium observed (in ppb)
1.	Andhra Pradesh	08	2876
2.	Bihar	09	57
3.	Chhattisgarh	04	138.2
4.	Gujarat	04	56.7
5.	Haryana	18	131.4
6.	Himachal Pradesh	01	70.7
7.	Jharkhand	04	69.9
8.	Karnataka	08	201.1
9.	Madhya Pradesh	10	233.9
10.	Maharashtra	03	48
11.	Odisha	04	59
12.	Punjab	17	156.5
13.	Rajasthan	21	181
14.	Tamil Nadu	10	302
15.	Telangana	06	158
16.	Uttar Pradesh	21	189
17.	W. Bengal	01	34.3

The occurrences of Uranium in groundwater beyond permissible limit (30 ppb) have been displayed on the map (Fig.7.7.1). The high Uranium concentration in states such as Punjab, Uttar Pradesh, and Haryana may be due to leaching through soil by heavy use of fertilizers in the agriculture lands. Since an extensive concentration of bicarbonate and phosphate have also been observed in groundwater samples of Punjab (Tripathi et al.2012), this may be a reason for high concentration observed in groundwater samples from shallow depths as phosphate and bicarbonates present in soil enhance the leaching and mobility of uranium.

In states such as Telangana, Tamilnadu, Jharkhand enhanced uranium concentration in groundwater may be due to geogenic inputs. The enhanced elemental concentration of uranium is usually found in hard rocks due to the partial melting and fractional crystallization of magma which enables uranium to be concentrated in silicate rocks.

REMEDIAL MEASURES

Finding a remedy for the uranium contaminated groundwater effectively and thoroughly, has become need of day. Remediation technologies can be classified into physical, chemical and biological methods. Bioremediation is divided into plant and microorganism methods. Each method consists of both advantages and disadvantages and the appropriate mitigation techniques should be need based.

Adsorption has a high removal efficiency, but costs are also higher. The coagulation process is simple and comparatively economical, but the standard effluent concentration is hard to reach, so there is a need for follow-up treatment. Combined with adsorption, coagulation can remove 99% of U. The extraction process can remove effluent U concentrations of less than 0.05mg / L, but it will produce a lot of sludge. Reverse osmosis is referred as a best technology, but due to its high cost it can not be used on community scale. The evaporation method is simple and effective, the removal rate is high, but there are high costs and sludge needs that must be dealt with. A review of various treatment technologies for Uranium removal from water and their technical achievability as reported by various researchers are given below in Table 7.7.4

7.7.5 Comparison of treatment methods for removal of Uranium.

Treatment Method	Technical Achievability (%)
Coagulation/filtration at high pH (10+)	> 95
Lime softening	85-99
Anion exchange	99
Reverse osmosis	>95
Activated alumina	90
Coagulation/filtration	80-89

(Source: Hand Book for Drinking Water Treatment, JJM, Ministry of Jal Shakti, Gov. of India).

7.8 TOTAL HARDNESS

Total hardness is predominantly caused by cations such as calcium and magnesium and anion such as bicarbonate and sulphate. Total hardness is defined as the sum of calcium and magnesium both expressed as CaCO_3 in mg/L. Hardness represents the soap-consuming capacity of water. Species that form insoluble compounds with soap Ca, Mg, Organic compounds etc. Total hardness is sum of Ca and Mg and expresses as CaCO_3 mg/l. EDTA titration. The two kind of hardness observed in water.

- Temporary hardness is due to Carbonate.
- Permanent hardness is due to Sulphate, Chloride or Nitrate.

The hardness in water is derived largely from contact with the soil and rock formations. Rain water as it falls upon the earth is in capable of dissolving the tremendous amount of solids found in many natural waters. People with kidney and bladder stones should avoid high content of calcium and magnesium in water (K. R. Karanth, 1997). The BIS permissible limit of hardness is 300 – 600 mg/L. The total hardness in groundwater was observed in a many part of the country. It is observed that there are several locations in the States of Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Rajasthan, Chhattisgarh, Haryana, Orissa, Punjab, Tamilnadu, kerala, Telangana, Haryana, Uttar Pradesh West Bengal, Bihar, Delhi, Jharkhand, Maharashtra, and West Bengal where the total hardness in ground water exceeds 600 mg/L. The details of locations where total hardness concentration more than 600 mg/l is given in table 7.8.1.

Table – 7.8.1 Number of location having total hardness > 600 mg/L in Indian States.

S. No.	State	No. of locations having TH> 600 mg/L
1	Andhra Pradesh	121
2	Bihar	31
3	Chhattisgarh	13
4	Delhi	8
5	DNH	1
6	Gujarat	133
7	Haryana	104
8	J&K	6
9	Jharkhand	8
10	Karnataka	70
11	Kerala	16
12	Madhya Pradesh	54
13	Maharashtra	107
14	Odisha	42
15	Punjab	18
16	Rajasthan	202
17	Tamil Nadu	310
18	Telangana	80
19	Uttar Pradesh	36
20	Uttarakhand	2
21	West Bengal	19
Total		1381

Table 7.8.2 Districts having total hardness > 600 mg/L in Ground Water in Different States of India

S.No.	State	Parts of District having Total Hardness > 600 mg/L as CaCO ₃
1	Andra Pradesh	Anantpur, Chittur, East Godavari, Guntur, Kadapa, Krishna, Kurnool, Nellore, Prakasham, Srikakulam, Vijayanagram, Visakapatnam, West Godavari
2	Bihar	Arwal, Aurangabad, Bhojpur, Buxar, E Champaran, Gaya, Gopalganj, Jehanabad, Katihar, Muzaffarpur, alanda, Nawada, Purnea, Rohtas, Samastipur, Siwan, Supaul, Aurangabad
3	Chhattisgarh	Balod, Bemetara, Bilaspur, Durg, Jashpur, Koriya, Raigarh, Ranandgaon
4	Delhi	Delhi
5	Gujrat	Ahmedabad, Amreli, Anand, Arvalli, Banaskantha, Bharuch, Bhavnagar, Botad, Chhota Udepur, Dahod, Devbhoomi Dwarka, Gandhinagar, Gir Somnath, Jamnagar, Junagadh, Kachchh, Kheda, Mahesana, Mahisagar, Morbi, Navsari, Panchmahal, Patan, Porbandar, Rajkot, Sabarkantha, Surat, Surendranagar, Tapi, Valsad
6	Haryana	Bhiwani, Faridabad, Fatehabad, Gurugram, Hisar, Jhajjar, Jind, Kaithal Karnal, Mahendragarh, Mewat, Palwal, Panipat, Rewari, Rohtak, Sirsa, Sonipat,
7	J&K	Baramulla, Jammu, Rajouri, Samba
8	Jharkhand	Bokaro, Chatra, E. Singhbhum, Giridih, Hazaribagh, Palamu, Saraikela,
9	Karnataka	Bagalkot, Ballari, Belagavi, Bengaluru, Rural, Bijapur, Chikballapura, Chikmagalur, Gulbarga, Hassan, Kolar, Koppal, Mandya, Mysore, Raichur, Ramnagara, Tumkur, Vijayanagara, Yadgir
10	Kerala	Kozhikode
11	Madhya Pradesh	Agar Malwa, Alirajpur, Bhind, Burhanpur, Chhatarpur, Chhindwara, Dhar, Gwalior, Harda, Hoshangabad, Indore, Khargone, Mandsaur, Neemuch, Raisen, Rajgarh, Ratlam, Rewa, Satna, Sehore, Sheopur, Shivpuri, Ujjain, Vidisha
12	Maharashtra	Ahmednagar, Akola, Amravati, Aurangabad, Beed, Bhandara, Buldhana, Chandrapur, Dhule, Gadchiroli, Hingoli, Jalgaon, Jalna, Kolhapur, Nagpur, Nandurbar, Nashik, Osmanabad, Parbhani, Pune, Raigad, Sangli, Satara, Solapur, Thane, Wardha, Washim, Yavatmal
13	Odisha	Anugul, Baleshwar, Bargarh, Baudh, Dhenkanal, Ganjam, Kalahandi, Kendrapara, Khordha, Mayurbhanj, Nayagarh, Puri, Sonapur
14	Punjab	Bhatinda, Faridkot, Fazilka, Mansa, Muktsar, Patiala, Sas Nagar
15	Rajasthan	Ajmer, Alwar, Banswara, Baran, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittaurgarh, Churu, Dausa, Dhaulpur, Ganganagar, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhalawar, Jodhpur, Karauli, Kota, Nagaur, Pali, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk, Udaipur
16	Tamil Nadu	Chennai, Coimbatore, Cuddalore, Dharmapuri, Dindigul, Erode, Kancheepuram, Kanyakumari, Karur, Krishnagiri, Madurai, Nagapattinam, Namakkal, Perambalur, Pudukkottai, Pudukottai, Ramanathapuram, Ramanathapuram, Salem, Sivaganga, Sivaganga, Thanjavur, Theni, Thiruvannamalai, Tirunelveli, Tiruppur, Tiruvallur, Tiruvarur, Trichy, Tuticorin, Vellore, Villipuram, Virudhunagar
17	Telangana	Adilabad, Karimnagar, Khammam, Mahabubnagar, Medak, Nalgonda, Nizamabad, Ranga Reddy, Warangal
18	Uttar Pradesh	Agra, Chitrakoot, Fatehpur, Gautam Buddha Nagar, Ghaziabad, Hardoi, Hathras, Jalaun, Jaunpur, Jhansi, Kanpur Dehat, Kanpur Nagar, Lalitpur, Mahamaya Nagar, Mathura, Meerut, Unnao
19	Uttarakhand	Haridwar
20	West Bengal	Bankura, Howrah, N24 Parganas, Paschim Barddhaman, Purulia, South 24 Parganas

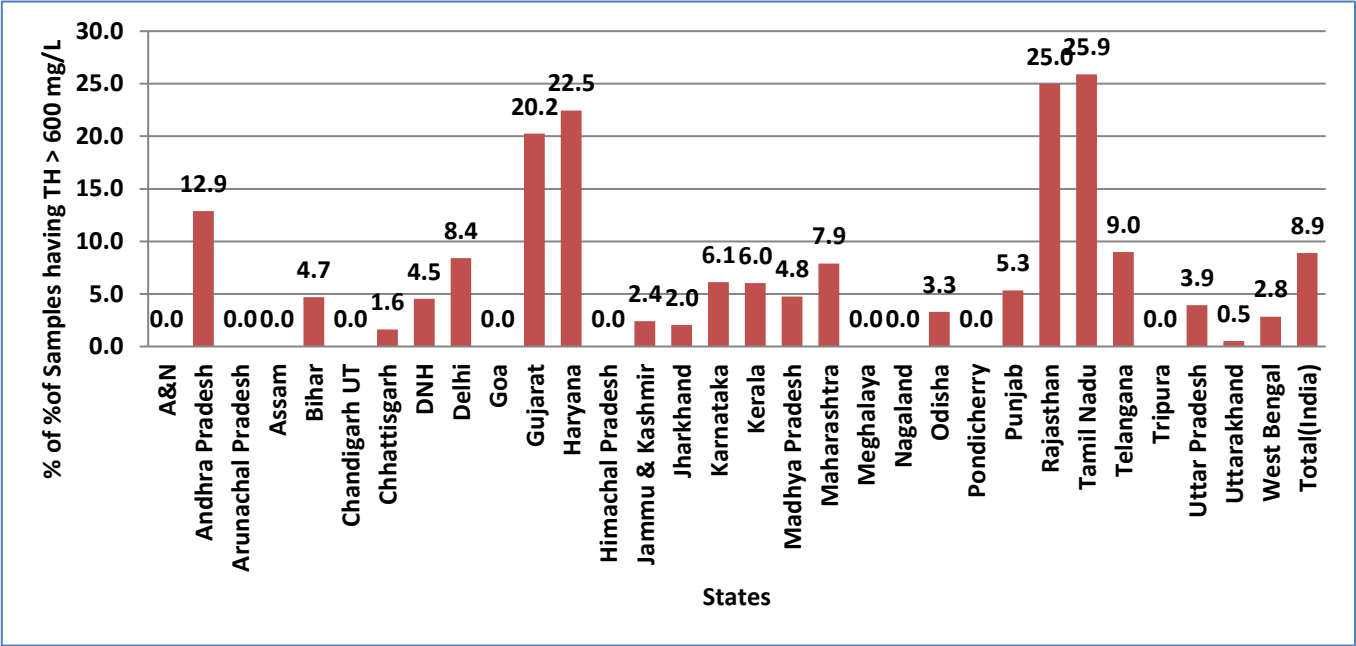


Fig 7.8.1 Bar diagram State-wise percentage of wells having Total hardness > 600 mg/L is shown as a bar diagram in.

Removal of total hardness

A few methods to remove hardness from water are,

- Chemical Process of Boiling Hard Water.
- Adding Slaked Lime (Clark's Process)
- Adding Washing Soda.
- Calgon Process.
- Ion Exchange Process.
- Using Ion Exchange Resins.

CARBONATE (TEMPORARY) HARDNESS also known as **Ca Bicarbonate**

$\text{Ca}(\text{HCO}_3)_2$ + Mg Bicarbonate $\text{Mg}(\text{HCO}_3)_2$. Removal by Boiling or adding Lime

NON-CARBONATE (PERMANENT) HARDNESS

Calcium Sulfate CaSO_4 + Magnesium Sulfate MgSO_4 & Calcium Chloride CaCl_2 + Magnesium Chloride MgCl_2

Removal by Lime-soda, Zeolite or Demineralization Processes

Table 7.8.4 State-wise percentage of samples having Total hardness >600 mg/L

S. No	State and UT	No. of Samples collected (NHS 2022-23)	No. of samples having TH > 600 mg/l	% of Samples (TH > 600 mg/L)
1	Andaman & Nicobar Islands	110	0	0.0
2	Andhra Pradesh	940	121	12.9
3	Arunachal Pradesh	18	0	0.0
4	Assam	319	0	0.0
5	Bihar	661	31	4.7
6	Chandigarh UT	1	0	0.0
7	Chhattisgarh	801	13	1.6
8	DNH	22	1	4.5
9	Delhi	95	8	8.4
10	Goa	63	0	0.0
11	Gujarat	657	133	20.2
12	Haryana	463	104	22.5
13	Himachal Pradesh	160	0	0.0
14	Jammu & Kashmir	250	6	2.4
15	Jharkhand	392	8	2.0
16	Karnataka	1141	70	6.1
17	Kerala	265	16	6.0
18	Madhya Pradesh	1136	54	4.8
19	Maharashtra	1358	107	7.9
20	Meghalaya	65	0	0.0
21	Nagaland	15	0	0.0
22	Odisha	1274	42	3.3
23	Pondicherry	16	0	0.0
24	Punjab	338	18	5.3
25	Rajasthan	809	202	25.0
26	Tamil Nadu	1197	310	25.9
27	Telangana	890	80	9.0
28	Tripura	67	0	0.0
29	Uttar Pradesh	917	36	3.9
30	Uttarakhand	396	2	0.5
31	West Bengal	670	19	2.8
	Total(India)	15507	1381	8.9

8.0 SUITABILITY OF GROUNDWATER FOR IRRIGATION PURPOSE

The chemical quality of water is an important factor to be considered in evaluating its usefulness for irrigation purposes. Plants grown by irrigation absorb and transpire water but leave nearly all the salts behind in the soil, where they accumulate and eventually prevent plant growth. Excessive concentrations of solute interfere with the osmotic process by which plant root membranes are able to assimilate water and nutrients. In areas where natural drainage is inadequate, the irrigation water infiltrating the root zone will cause water table to rise excessively. In addition to problems caused by excessive concentration of dissolved solids, certain constituents in irrigation water are especially undesirable and some may be damaging even when present in small concentrations. Irrigation indices viz. Sodium Adsorption Ratio (SAR) and Residual Sodium Carbonate (RSC) have been evaluated to assess the suitability of ground water for irrigation purposes.

Alkali Hazard

In the irrigation water, it is characterized by absolute and relative concentrations of cations. If the sodium concentrations are high, the alkali hazard is high and if the calcium & magnesium levels are high, this hazard is low. The alkali soils are formed by the accumulation of exchangeable sodium and are characterized by poor tilt and low permeability. The U.S. Salinity laboratory has recommended the use of sodium adsorption ratio (SAR) as it is closely related to adsorption of sodium by the soil.

SAR is derived by the following equation:

$$SAR = \frac{Na^{+}}{\sqrt{\frac{Ca^{2+} + Mg^{2+}}{2}}}$$

The water with regard to SAR is classified into four categories

➤ **S₁ – Low Sodium Water** (SAR <10)

Such waters can be used on practically all kinds of soils without any risk or increase in exchangeable sodium.

➤ **S₂ – Medium Sodium Water** (SAR 10-18)

Such waters may produce an appreciable sodium hazard in fine textured soil having high cation exchange capacity under low leaching.

➤ **S₃ – High Sodium Water** (SAR >18-26)

Such waters indicate harmful concentrations of exchangeable sodium in most of the soil and would require special management, good drainage, high leaching and addition of organic matter to the soil. If such waters are used on gypsiferous soils the exchangeable sodium could not produce harmful effects.

➤ **S₄ – Very High Sodium Waters** (SAR >26)

Generally, such waters are unsatisfactory for irrigation purposes except at low or perhaps at medium salinity where the solution of calcium from the soil or addition of gypsum or other amendments makes the use of such waters feasible.

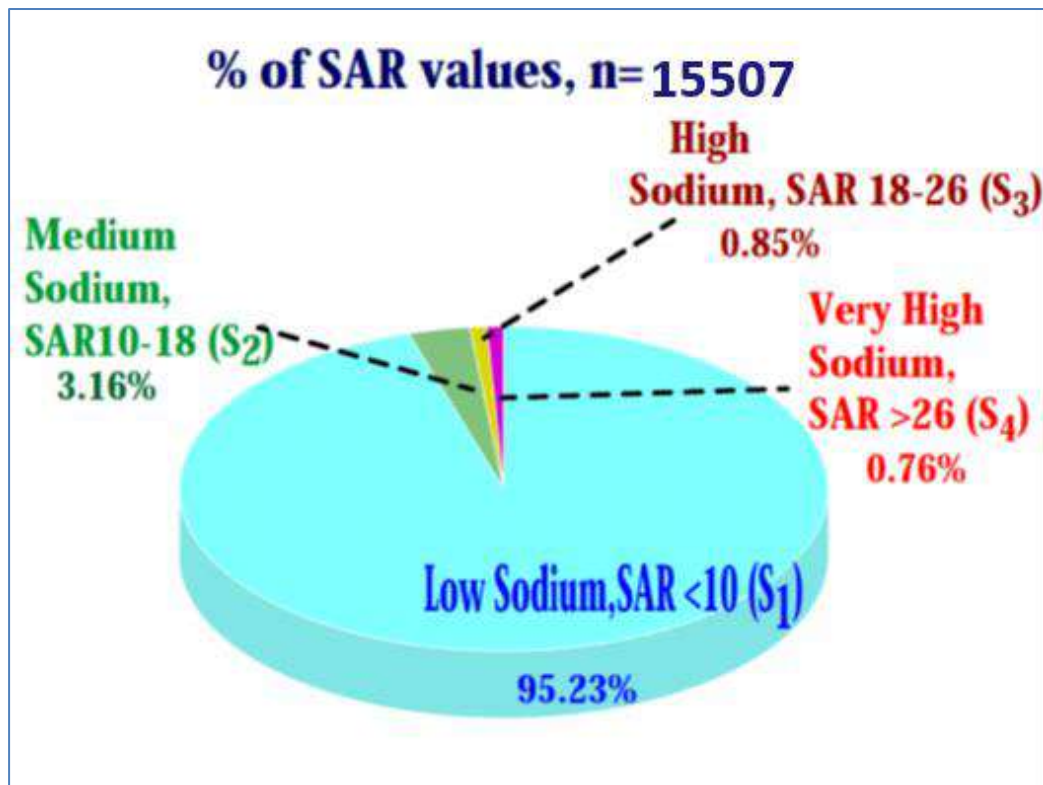


Figure 8.1: Percentage of groundwater samples according to SAR classifications (n=15507).

The computed SAR values ranges from 0.01 to 64.33. The maximum SAR value has been found at Konnidigaripalli of Kadappa district in Andhra Pradesh. It is apparent from Fig. 8.1 that 95.23% samples belong to excellent category (S_1) and only 0.76% water samples are associated with very high sodium category (S_4) and is unsuitable for irrigation.

According to SAR classification, 100% of water samples in Arunachal Pradesh, Assam, Andaman & Nicobar, Himachal Pradesh, Kerala, Meghalaya, Nagaland and Tripura fall in excellent category (S_1). While in Andhra Pradesh, Gujarat, Haryana, Punjab, Rajasthan 5%, 8.18%, 8.82%, 9.47% and 19.04% samples are associated with medium sodium hazard and can be classified as good category (S_2) for irrigation use (Table 8.1)

It was found that in Andhra Pradesh, Gujarat, Haryana, Karnataka, Punjab, Rajasthan, Tamil Nadu and Telangana 0.53%, 0.9%, 0.21%, 0.08%, 0.88%, 5.19%, 0.16% and 0.11% samples fall in Very high sodium range and are unsuitable for use in irrigation practices (Fig. 8.2).

Table 8.1: Summary of irrigation quality of the groundwater samples in various states based on SAR classifications.

State	%. of samples in various SAR range			
	(low Sodium <10)	(medium Sodium 10-18)	(high Sodium 18-26)	(very high Sodium >26)
Andaman & Nicobar	100	0	0	0
Andhra Pradesh	93.83	5	0.64	0.53
Assam	100	0	0.00	0.00
Arunachal Pradesh	100	0	0.00	0.00
Bihar	99.8	0.19	0.00	0.00
Chhattisgarh	99.87	0.12	0.00	0.00
Delhi	93.68	3.16	1.05	2.11
Goa	100	0	0.00	0.00
Gujarat	89.09	8.18	1.36	0.91
Haryana	89.03	8.82	1.51	0.22
Himachal Pradesh	100	0	0	0
Jammu & Kashmir	99.6	0.40	0.00	0.00
Jharkhand	100	0.00	0.00	0.00
Karnataka	97.28	2.02	0.61	0.09
Kerala	100	0.00	0.00	0.00
Madhya Pradesh	98.86	1.06	0.09	0.00
Maharashtra	98.75	1.18	0.07	0.00
Meghalaya	100.00	0.00	0.00	0.00
Nagaland	100.00	0.00	0.00	0.00
Odisha	99.92	0.08	0.00	0.00
Pondicherry	93.75	6.25	0.00	0.00
Punjab	87.57	9.47	2.07	0.89
Rajasthan	70.33	19.04	5.44	5.19
Tamilnadu	96.24	3.17	0.42	0.17
Telangana	97.09	2.13	0.34	0.11
Uttar Pradesh	96.62	2.94	0.33	0
Uttarakhand	99.50	0.00	0.50	0
West Bengal	98.66	0.90	0.45	0

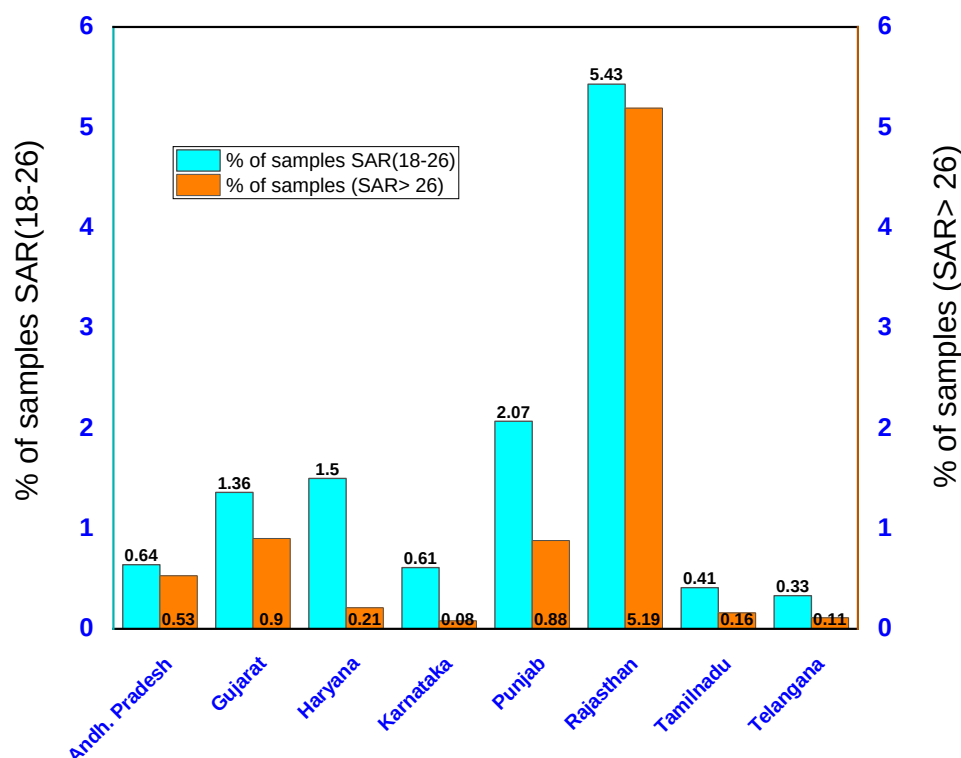


Figure 8.2: percentage of samples with respect to SAR values.

In Gujarat Ahmedabad, Amreli, Bharuch, Bhavnagar and Surendranagar district some samples are associated with category S_4 and are not suitable for irrigation. In Rajasthan Barmer, Bharatpur, Bikaner, Churu, Hanumangarh, Jalore, Jhunjhunu, Jodhpur, Karauli, Nagaur and Pali district 42 water samples exhibit SAR value more than 26 and are unsuitable for irrigation.

Residual Sodium Carbonate (RSC)

If the enriched carbonate (residual) concentration becomes relatively high, carbonates get together with calcium and magnesium to form precipitates. The relative abundance of sodium in comparison to alkaline earths and the quantity of bicarbonate and carbonate in excess of alkaline earths also influences the suitability of water for irrigation. This excess is represented in terms of “Residual Sodium Carbonate” (RSC). The highly soluble sodium carbonate known as residual sodium carbonate (RSC) is defined as;

$$RSC = (HCO_3^- + CO_3^{2-}) - (Ca^{2+} + Mg^{2+})$$

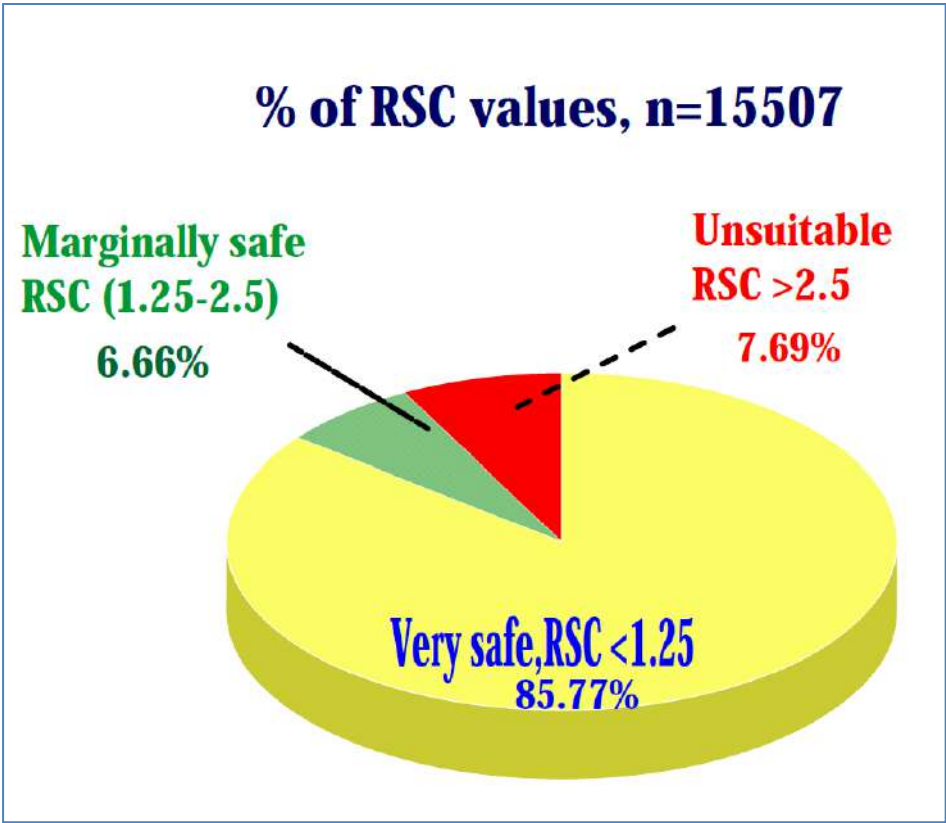


Figure 8.3: Percentage of groundwater samples in various categories according to RSC classifications (n=15507) (Wilcox et al.,1954).

Waters with high RSC produces harmful effects on plant development and is not suitable for irrigation. Waters associated with $RSC < 1.25$ are of excellent irrigation quality and can be safely applied for irrigation for almost all crops without the risks associated with residual sodium carbonate (Wilcox et al.,1954). If the RSC values lie between 1.25 and 2.5, the water is of an acceptable quality for irrigation. Waters associated with RSC values higher than 2.5 are not acceptable for irrigation. In fig. it can be seen that in India 85.77% collected water samples are associated with RSC values less than 1.25 and are safe for use in irrigation practices. Only 7.69% water samples are associated with RSC values more than 2.5 and are unsuitable for irrigation. The water with high RSC values if applied for irrigation causes soil to become infertile owing to deposition of sodium. Table 8.4 summarizes the irrigation quality of the groundwater samples in various states based on RSC values.

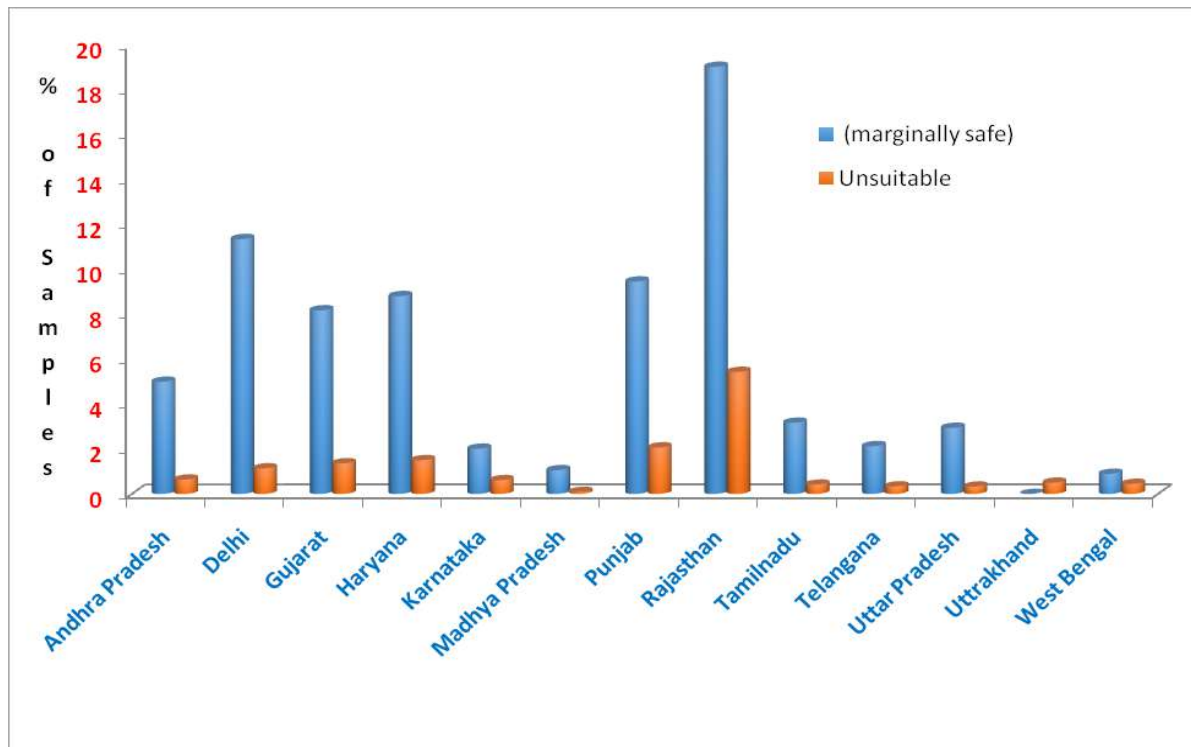


Figure 8.4: Percentage of samples with respect to RSC values.

According to RSC classification 100% of water samples in Arunachal Pradesh, Assam, Andaman & Nicobar, Goa, Kerala, Meghalaya and Nagaland fall in very safe category with RSC values less than 1.25.

Table 8.2: Summary of irrigation quality of the groundwater samples in various states based on RSC values.

State	%. of samples in various RSC range		
	<1.25	1.25-2.5	>2.5
	(Very safe)	(marginally safe)	Unsuitable
Andaman & Nicobar	100	0	0
Andhra Pradesh	93.83	5	0.64
Assam	100	0	0.00
Arunachal Pradesh	100	0	0.00
Bihar	99.8	0.19	0.00
Chhattisgarh	99.87	0.12	0.00
Delhi	87.5	11.36	1.14
Goa	100	0	0.00
Gujarat	89.09	8.18	1.36
Haryana	89.03	8.82	1.51
Himachal Pradesh	98.74	1.26	0.00
Jammu & Kashmir	99.6	0.40	0.00
Jharkhand	100	0.00	0.00
Karnataka	97.28	2.02	0.61
Kerala	100	0.00	0.00

9.0 Wilcox diagram

EC and sodium concentration are very important in classifying irrigation water. The Wilcox diagram (Wilcox 1948) relating EC and %Na shows (fig. 9.0) that all the samples are plotted in excellent to good and good to permissible categories in most of the water samples indicating their suitability for irrigation. Most of the samples associated with doubtful to unsuitable zone for irrigation belong to Andhra Pradesh, Gujarat, Haryana, Rajasthan and Punjab. Wilcox diagram of some of the States of India is presented as Fig. 9.0 a to 9.0f.

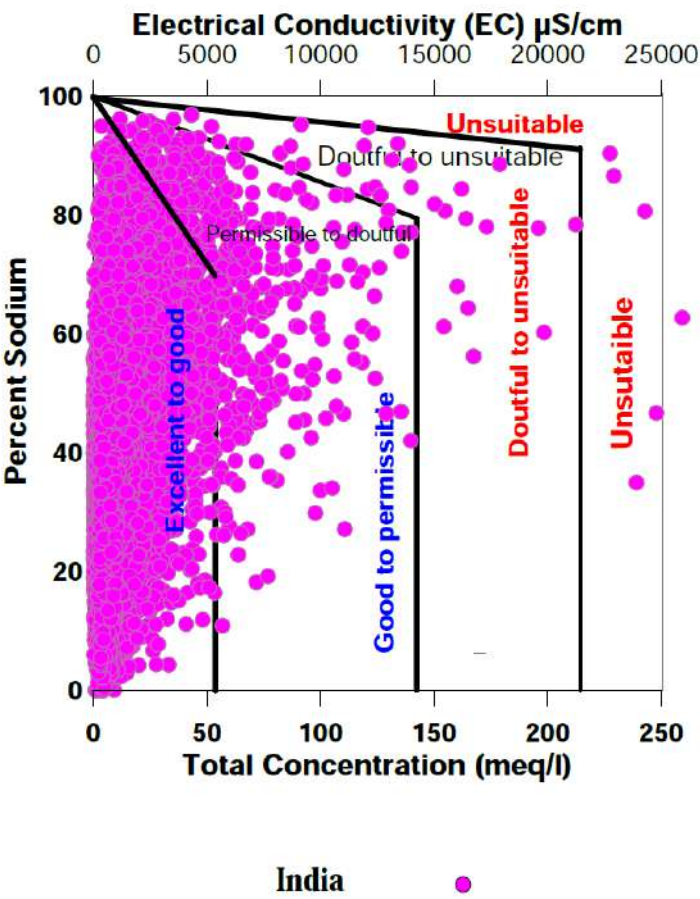


Fig.9.0 : Plots of sodium percent verses electrical conductivity (after Wilcox 1955) in groundwater samples of India.

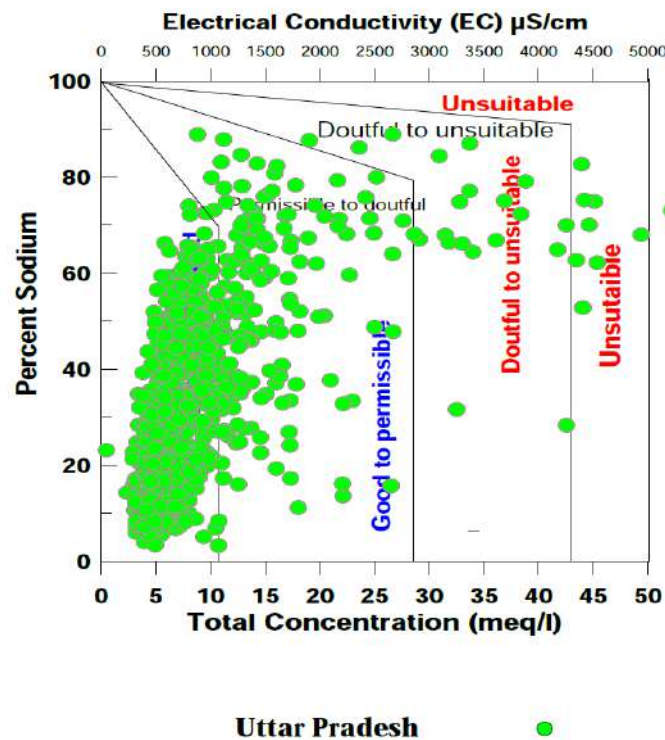


Fig.9.0a : Plots of sodium percent verses electrical conductivity (after Wilcox 1955) in groundwater samples in Uttar Pradesh.

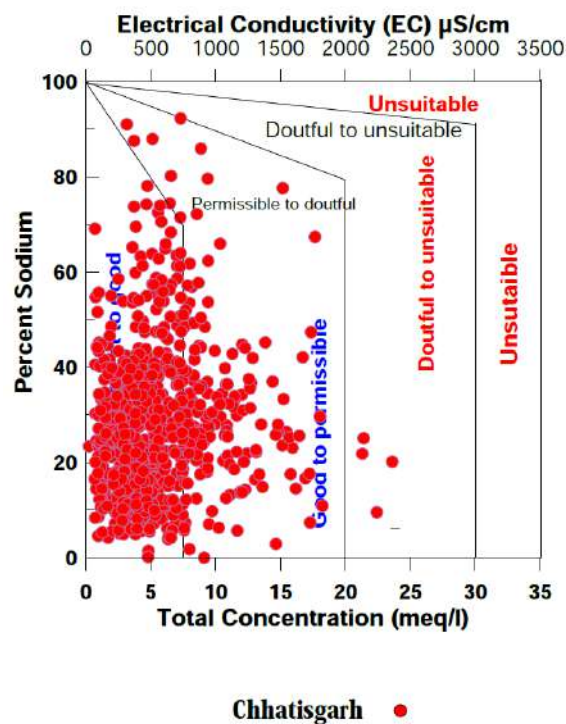


Fig.9.0b : Plots of sodium percent verses electrical conductivity (after Wilcox 1955) in groundwater samples in Chhattisgarh.

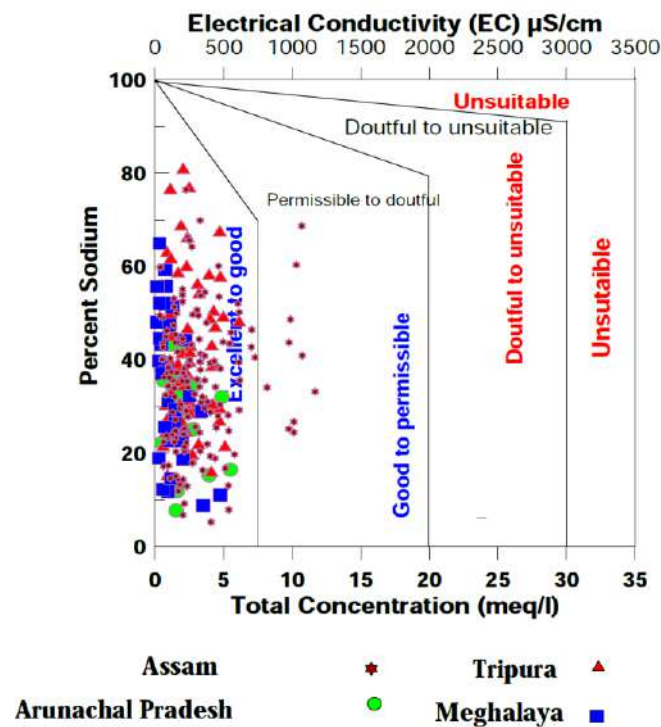


Fig.9.0c : Plots of sodium percent verses electrical conductivity (after Wilcox 1955) in groundwater samples in North Eastern States.

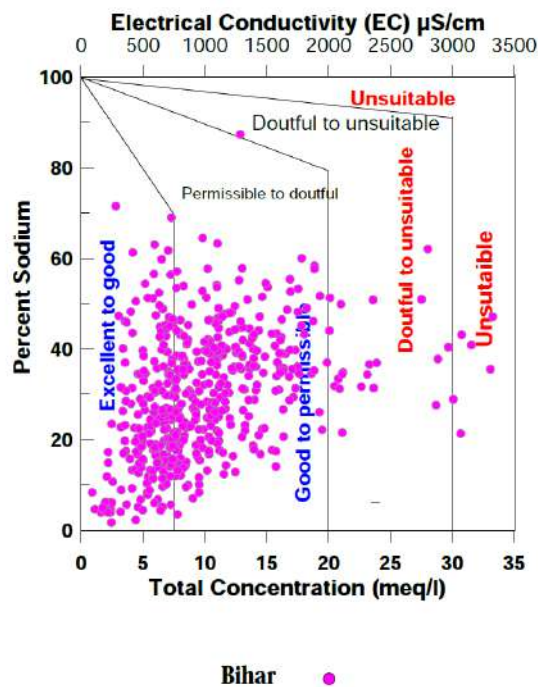


Fig.9.0d : Plots of sodium percent verses electrical conductivity (after Wilcox 1955) in groundwater samples in Bihar.

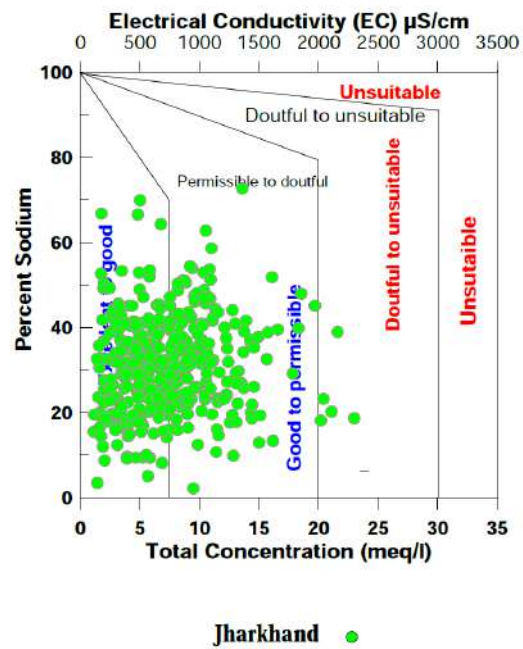


Fig.9.0e : Plots of sodium percent verses electrical conductivity (after Wilcox 1955) in groundwater samples in Jharkhand.

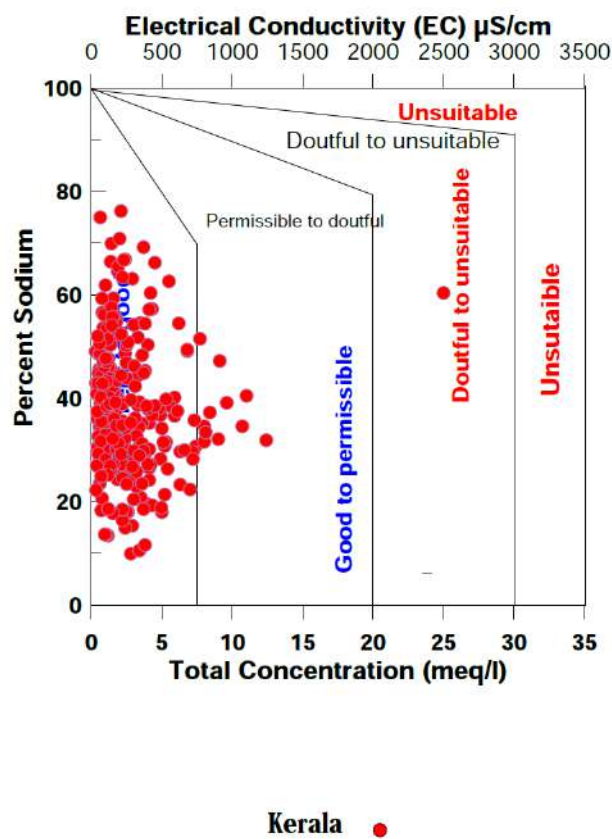


Fig.9.0f : Plots of sodium percent verses electrical conductivity (after Wilcox 1955) in groundwater samples in Kerala.

9.1 Piper Diagram:

Piper diagram (Piper 1944) describes the process responsible for the evolution of hydrogeochemical parameter in groundwater. Based on the major cation and major anion content in the water samples and plotting them in the trilinear diagram, hydrochemical facies could be identified. Hydro-chemical facies are very useful in investigating diagnostic chemical character of water in hydrologic systems. Different types of facies within the same group formations are due to characteristic ground water flow through the aquifer system and effect of local recharge. The types of facies are inter-linked with the geology of the area and distribution of facies with the hydrogeological controls. Hydrochemical facies are delineated by plotting percentage reacting value of major ions on tri-linear diagrams know as Piper Diagram.

In India, cation chemistry is dominated by calcium is followed by sodium and Potassium. In anion side bicarbonate is dominating anion followed by chloride and sulphate. The facies mapping shows (Fig.9.1) that Ca-HCO₃ is the dominant hydrogeochemical facies followed by mixed chemical character of hydrogeochemical facies.

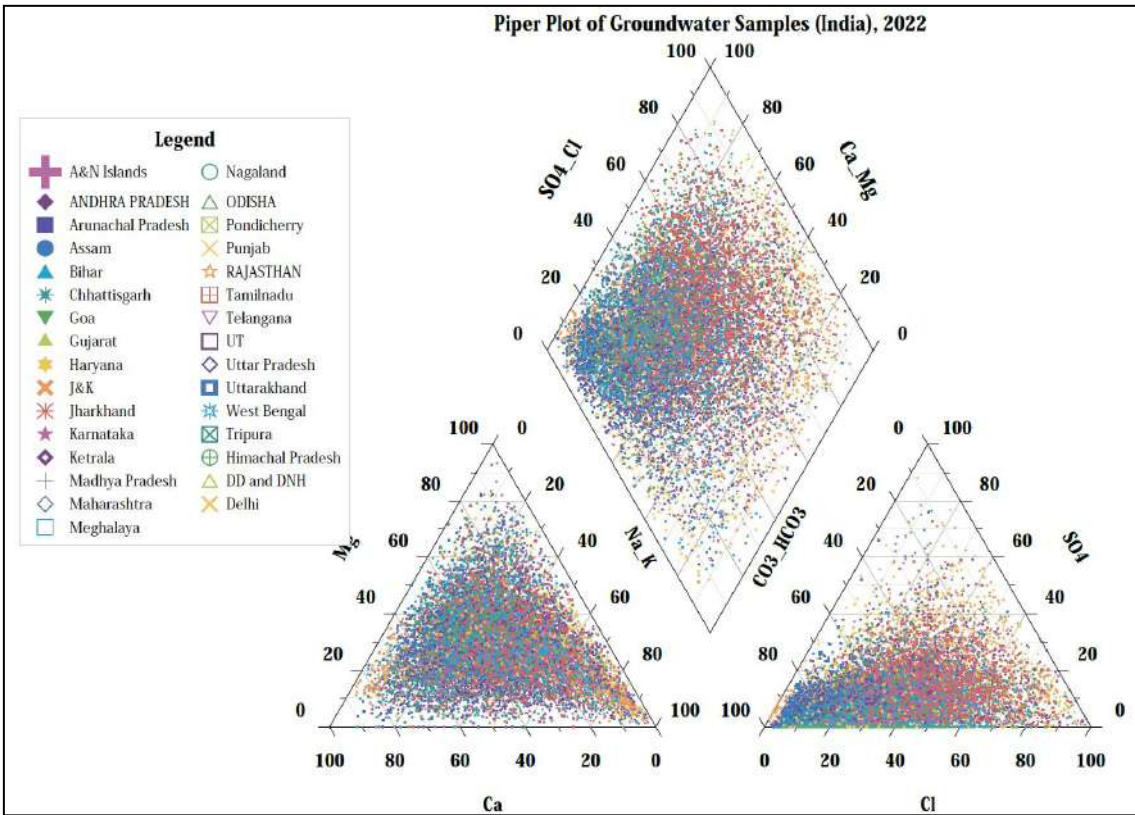


Fig- 9.1 Piper diagram of groundwater of India.

The Piper Plot showing hydrochemical species in Uttar Pradesh , Jharkhand, Karnataka, NE States and Chhattisgarh are displayed in Fig.9.1 a to 9.1 e.

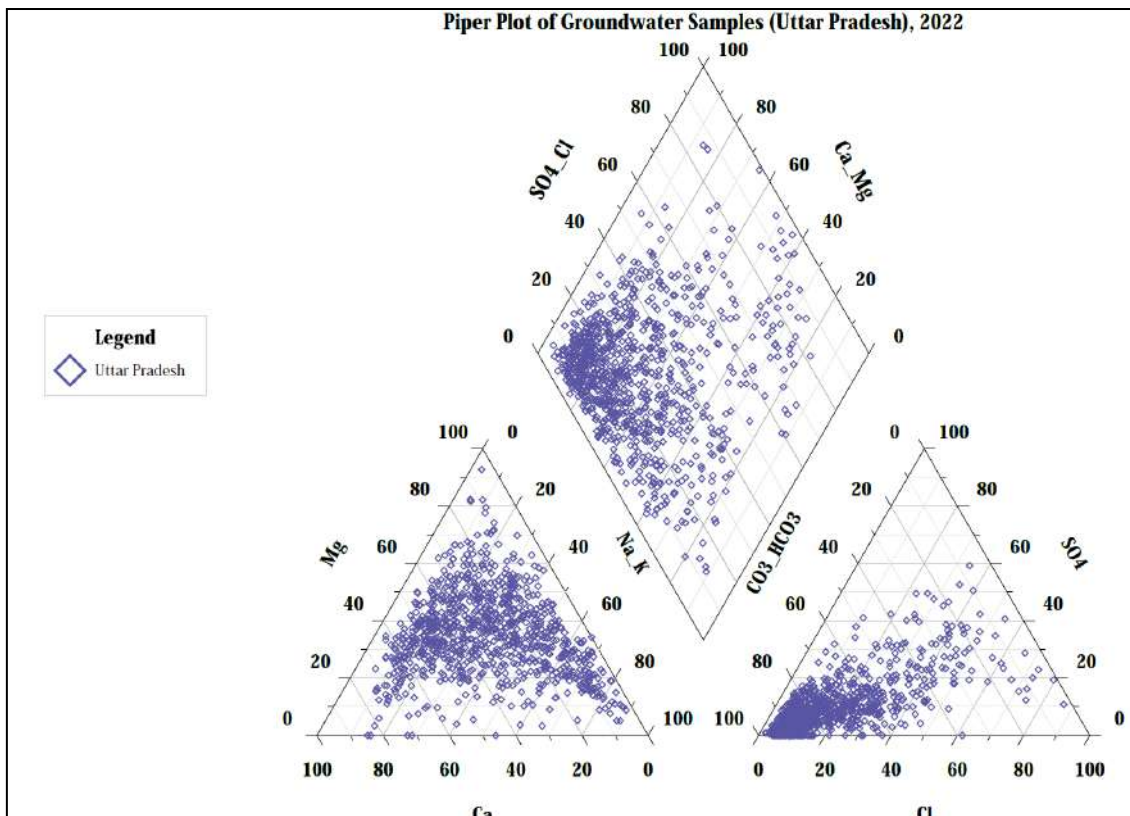


Fig- 9.1a Piper diagram of groundwater of Uttar Pradesh.

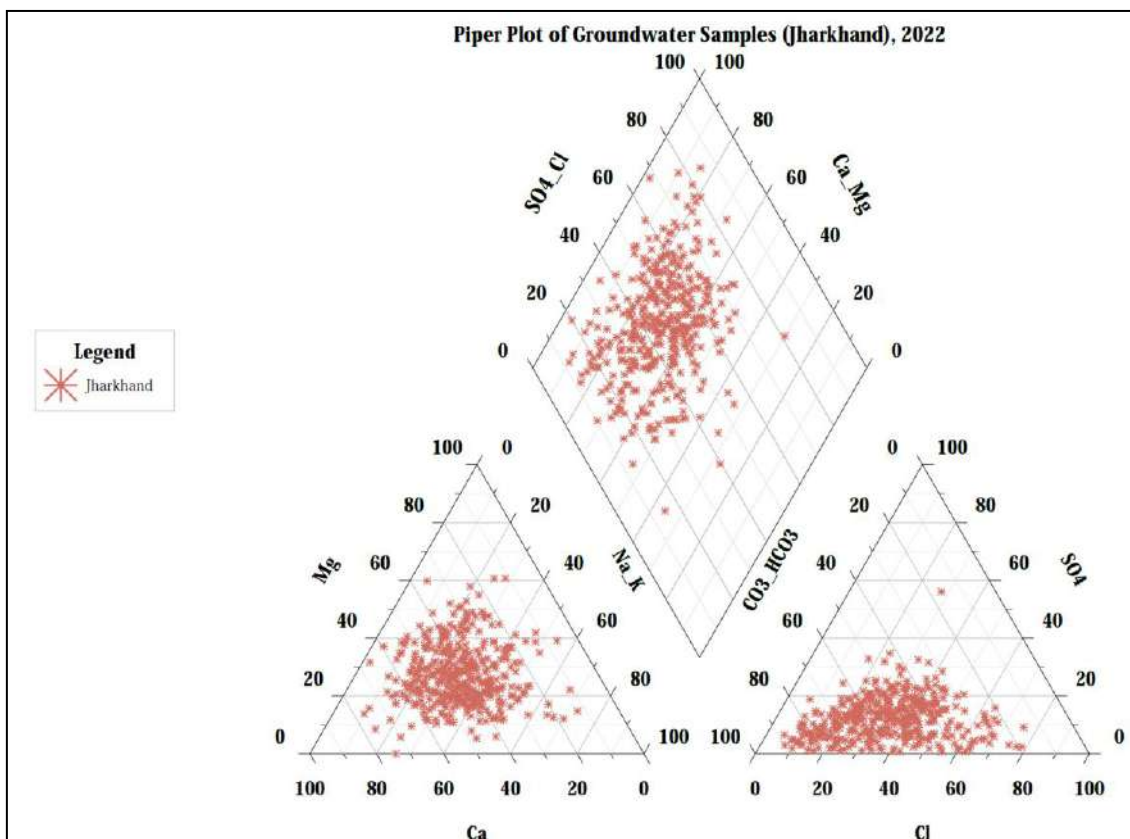
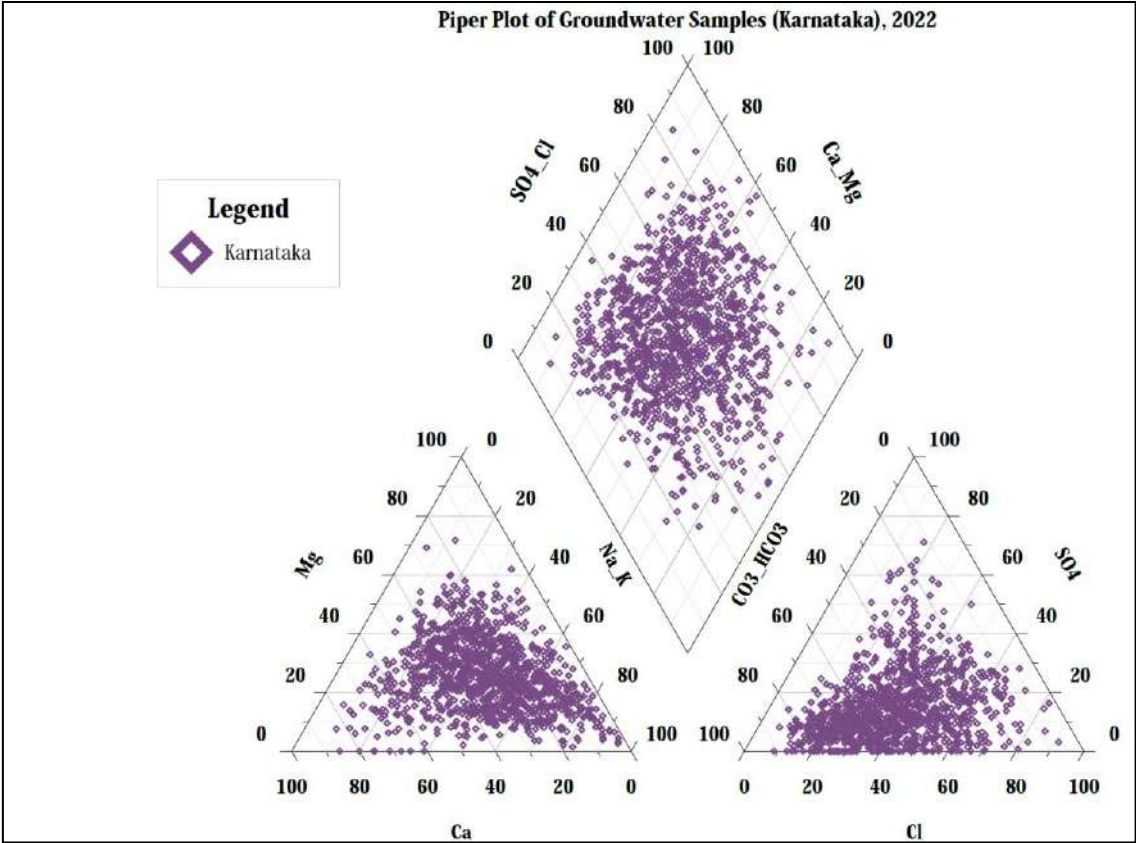
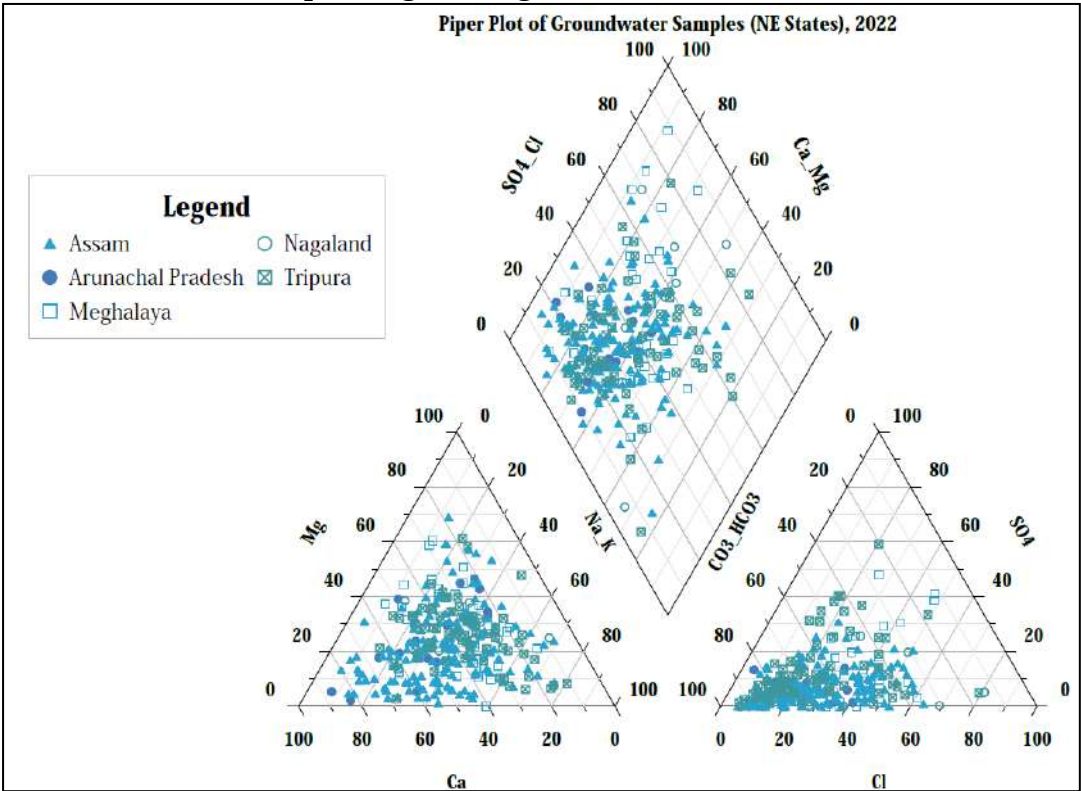


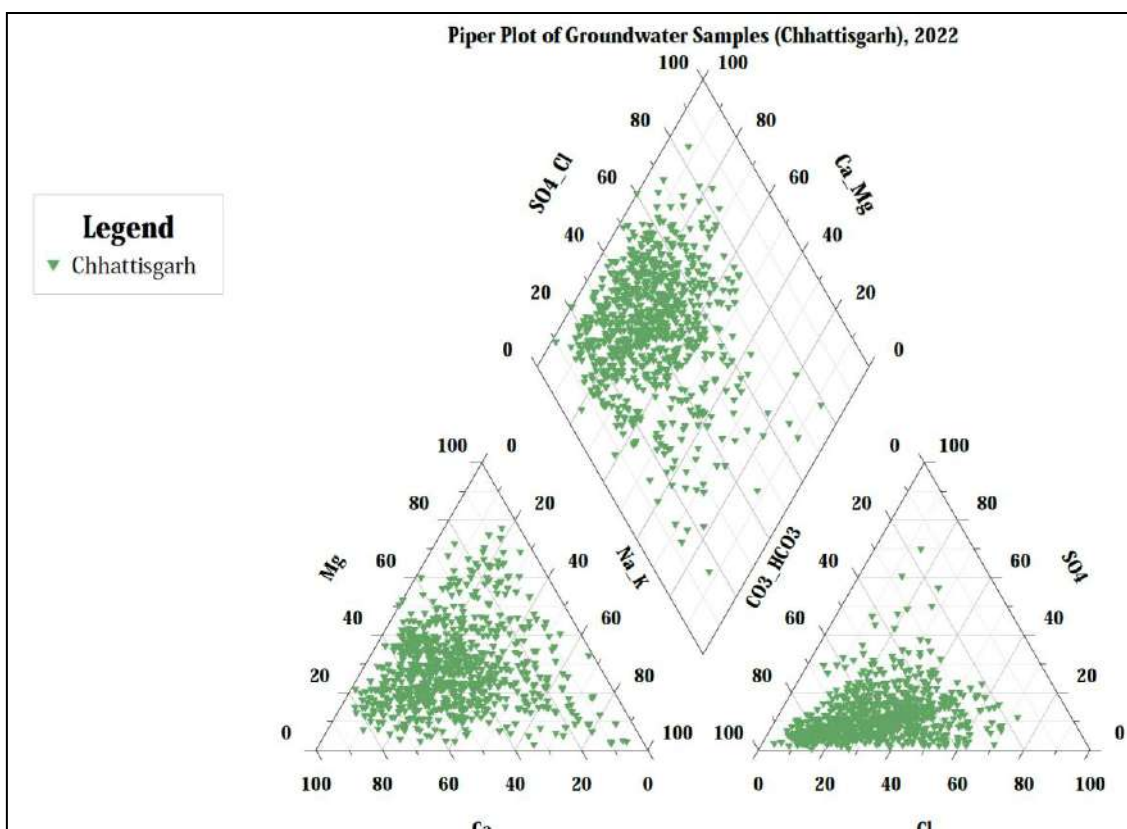
Fig- 9.1 b Piper diagram of groundwater of Jharkhand.



9.1 c Piper diagram of groundwater of Karnatka.



9.1 d Piper diagram of groundwater of NE States.

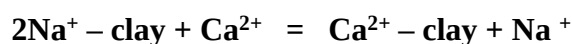


9.1 e Piper diagram of groundwater of Chhattisgarh State.

The piper plots of the Uttar Pradesh is exhibited that the groundwater is mostly Ca-HCO₃ type in nature. In Jharkhand ground water is mix to Ca-HCO₃ in nature. In Karnataka it is Mix to Na-Cl type in nature. In Northern States it is Ca-HCO₃ in nature and in Chhattisgarh majority of groundwater is Ca-HCO₃ in nature, where as in few locations it is Na-HCO₃ in nature.

9.2 X-Y Plot:

If halite dissolution is responsible for the sodium, the Na⁺/Cl⁻ ratio is approximately one, whereas a ratio greater than one, it is typically interpreted as Na⁺ released from Silicate weathering reaction. In the water samples of the shallow aquifers of India, 28% of the samples fall along the equilibrium in the Na⁺/Cl⁻ plot, indicating common source of halite for both the ions (Fig.9.2). In the water samples of the shallow aquifers of India, 45.4% of the samples have molar ratio greater than one indicating ion exchange is the major process. It is where Na montmorillonite clay reacts with calcium and magnesium and releases sodium (sometimes called natural softening).



The observed Na⁺/Cl⁻ < 1, may be attributed to groundwater interaction with connate seawater in coastal areas and Cl⁻ enrichment from anthropogenic sources such as

irrigation return flows or domestic waste disposal in another areas. Bivariant plot of Uttar Pradesh, Bihar and Jharkhand is shown in Fig.9.2a & 9.2b.

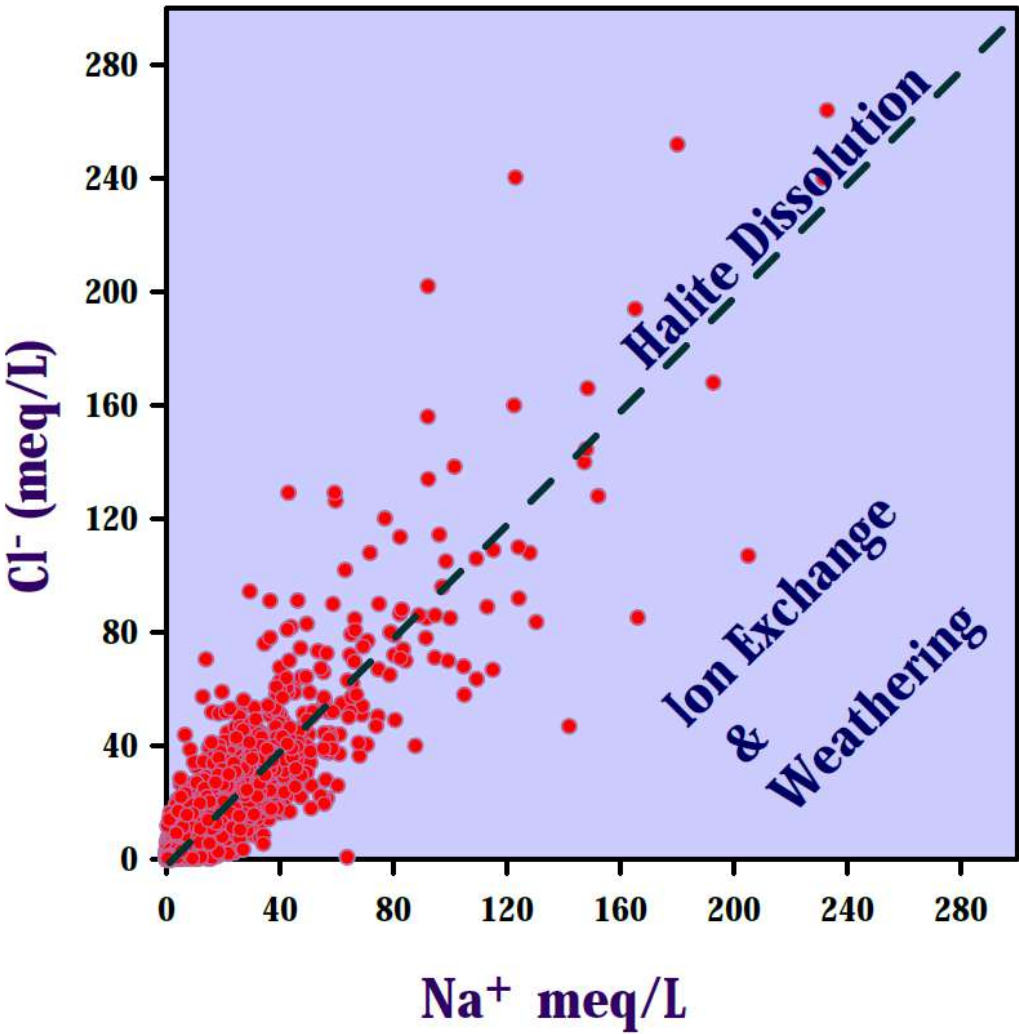


Fig. 9.2: The plot for Na versus Cl in groundwater samples of India

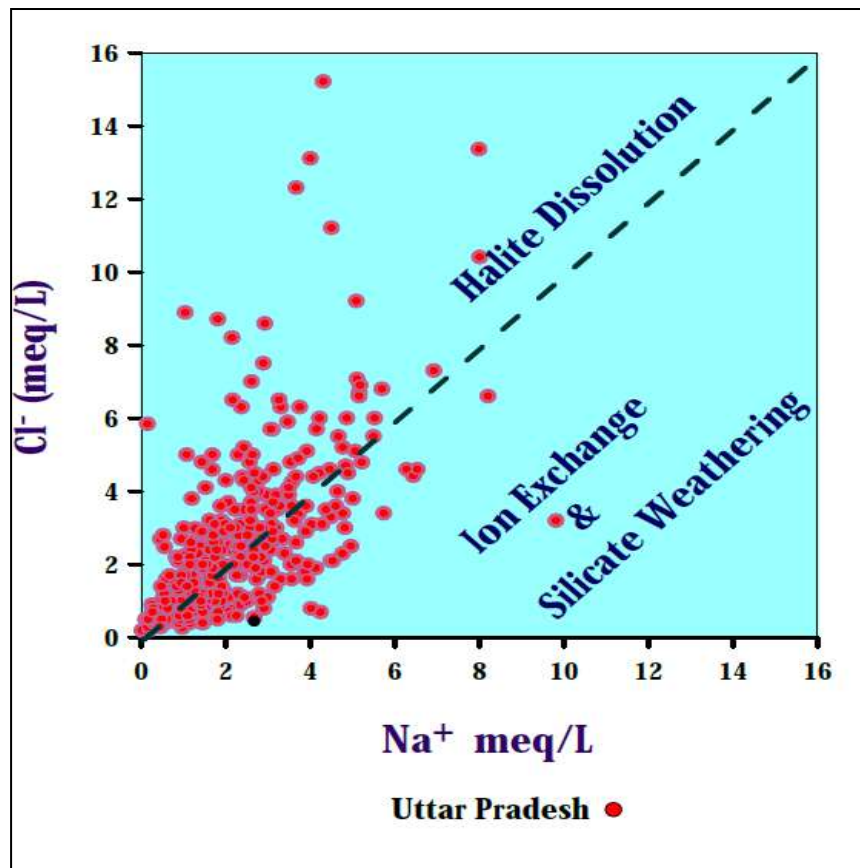


Fig.9.2a: The plot for Na versus Cl in groundwater samples of Uttar Pradesh

In Uttar Pradesh sodium and chloride enriched in groundwater by halide dissolution, ion exchange and silicate weathering processes.

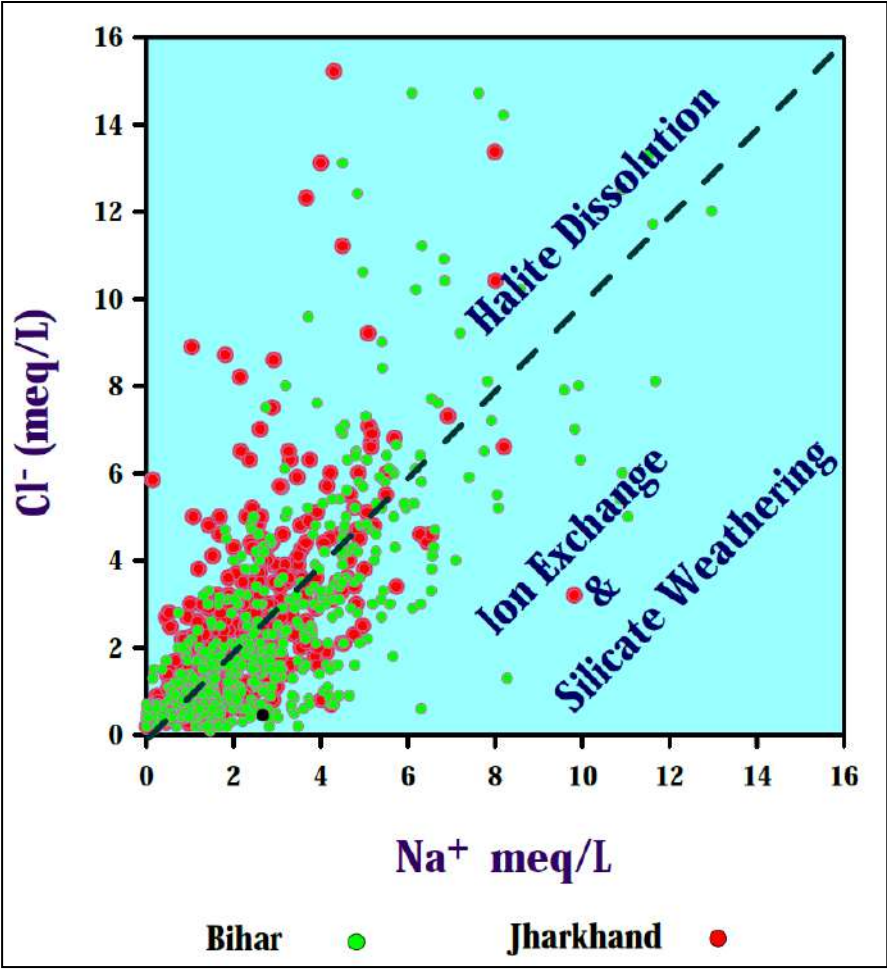


Fig. 9.2b: The plot for Na versus Cl in groundwater samples of Bihar and Jharkhand

In Bihar ion exchange is main mechanism for sodium and chloride enrichment in groundwater and in Jharkhand ion exchange and halide dissolution both of the processes are responsible for sodium and chloride enrichment in groundwater.

10.0 Bibliography

- APHA (2017), “Standard Methods for the Examination of Water and Wastewater (22th Ed.)”. Washington, Dc: American Public Association.
- CGWB (2018), “Ground Water Quality In Shallow Aquifers of India”. Faridabad: Central Ground Water Board, Ministry of water Resources, Government of India.
- Drinking water standards of BIS 10500: 2012.
- Karanth K.R. (1997), „Groundwater Assessment, Development and Management. New Delhi, India”: Tata Mcgraw-Hill Publishing Company Limited.
- Todd D.K., Groundwater Hydrology. John Wiley and sons Inc. Newyork, 1976
- USSL (1954), Diagnosis and improvement of saline and alkali soils. USDA Agr. Handbook No. 60, Washington DC.
- Freeze, R.A., and Cherry, J.A., 1979, Groundwater: New Jersey, Prentice Hall.
- Hem, J.D., 1985, Study and interpretation of the chemical characteristics of natural water (3rd ed.): U.S. Geological Survey, Water Supply Paper.2254.
- L.V. Wilcox, (1955), “Classification and Use of Irrigation Waters”, U.S. Department of Agriculture Circle, Amer. J. of Science, Vol,8, No.3, pp. 123128.
- N. Manivasagam (1984), Physico-Chemical Examination of Water, Sewage And Industrial Effluents, PragatiPrakashan, Meerut.
- Piper, A.M., 1944, A graphical procedure in the geochemical interpretation of water analysis: American Geophysical Union Trans., v. 25, p. 914-923.

Annexure I**Locations having Electrical Conductivity > 3000 $\mu\text{S}/\text{cm}$ in Ground Water in Different States/UT of India**

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
1	A&N Islands	South Andaman	Ograbraj	92.6581	11.6636	3079
2	Andhra Pradesh	Anantpur	Talapula - Pz	78.2625	14.2431	3010
3	Andhra Pradesh	Anantpur	Gadehothur	77.3053	15.0150	3106
4	Andhra Pradesh	Anantpur	Madakasira - 1	77.2761	13.9411	3282
5	Andhra Pradesh	Anantpur	Mohammadabad	78.0081	13.9714	3460
6	Andhra Pradesh	Anantpur	Amidala	77.2500	14.8417	3530
7	Andhra Pradesh	Anantpur	Nalla Cheruvu	78.1878	13.9872	3640
8	Andhra Pradesh	Anantpur	Inagaluru	78.0392	14.0472	3731
9	Andhra Pradesh	Anantpur	Talupula	78.2600	14.2436	4180
10	Andhra Pradesh	Anantpur	Igudur	77.9400	14.9700	13000
11	Andhra Pradesh	Chittur	Kalakoda	78.7875	13.8275	3360
12	Andhra Pradesh	Chittur	Valiveedu-Pz	79.0761	13.5272	3791
13	Andhra Pradesh	Chittur	Kalakada	79.1778	13.0417	3864
14	Andhra Pradesh	Chittur	Basani Khonda	78.5294	13.5519	6126
15	Andhra Pradesh	East Godavari	Sakhinetipalli	81.7514	16.4083	3010
16	Andhra Pradesh	East Godavari	Rowtulapudi	82.3683	17.3761	3090
17	Andhra Pradesh	East Godavari	Uppada	82.3359	17.0807	3100
18	Andhra Pradesh	East Godavari	Kasinadhapuram	82.2306	16.9250	3900
19	Andhra Pradesh	East Godavari	Mobalacherevu	82.0722	16.6160	3930
20	Andhra Pradesh	East Godavari	Hamsavaram	82.4937	17.2923	3990
21	Andhra Pradesh	East Godavari	Gollaprolu	82.2865	17.1539	4706
22	Andhra Pradesh	East Godavari	Fishing Harbour	82.2758	16.9851	5530
23	Andhra Pradesh	Guntur	Amaravati	80.3612	16.5733	3040
24	Andhra Pradesh	Guntur	Bellamkonda	80.0076	16.4922	3210
25	Andhra Pradesh	Guntur	Vykuntapuram	80.4127	16.5660	3320
26	Andhra Pradesh	Guntur	Krosur	80.1393	16.5429	3530
27	Andhra Pradesh	Guntur	Pisapadu	80.1431	16.4979	3680
28	Andhra Pradesh	Guntur	Mandadi	79.4054	16.4084	3690
29	Andhra Pradesh	Guntur	Sattenapalli	80.1479	16.4063	3900
30	Andhra Pradesh	Guntur	Mandhadam	80.5316	16.5145	4130
31	Andhra Pradesh	Guntur	Repalle	80.8397	16.0288	4650
32	Andhra Pradesh	Guntur	Rompicherla	79.9133	16.2100	4690
33	Andhra Pradesh	Guntur	Utukuru	80.2018	16.5660	4740
34	Andhra Pradesh	Guntur	Pedda Parimi	80.4552	16.4599	4890
35	Andhra Pradesh	Guntur	Santagudipadu	79.9141	16.2534	5350
36	Andhra Pradesh	Guntur	Inturu	80.6199	16.0597	5390
37	Andhra Pradesh	Guntur	Guntur	80.4317	16.2985	5930
38	Andhra Pradesh	Guntur	Phanidharam	80.3969	16.3608	7090
39	Andhra Pradesh	Guntur	Kolluru	80.8171	16.1308	7840
40	Andhra Pradesh	Guntur	Prattipadu	80.3318	16.1803	8320
41	Andhra Pradesh	Kadapa	Muddanur-Pz	78.4000	14.6772	3300
42	Andhra Pradesh	Kadapa	Lakkireddipalli	78.6983	14.1850	3630
43	Andhra Pradesh	Kadapa	Prabhalaveedu	79.0108	14.7951	4880
44	Andhra Pradesh	Kadapa	Kanagudur	78.6200	14.9072	5530
45	Andhra Pradesh	Kadapa	Konnidigaripalli	78.9553	13.9856	12100
46	Andhra Pradesh	Krishna	Bomminampadu	81.2170	16.4736	3150
47	Andhra Pradesh	Krishna	Vissannapet-New	80.7836	16.9360	3350
48	Andhra Pradesh	Krishna	Kautaram	81.0761	16.3357	3420
49	Andhra Pradesh	Krishna	Bantumilli1	81.2722	16.3697	3640
50	Andhra Pradesh	Krishna	Balliparru	81.1872	16.2774	3730

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
51	Andhra Pradesh	Krishna	Gudur	81.0849	16.2202	3770
52	Andhra Pradesh	Krishna	Pedana_New	81.1494	16.2583	3800
53	Andhra Pradesh	Krishna	Kakarla	80.6352	17.0561	3810
54	Andhra Pradesh	Krishna	Pamaru	80.9675	16.3217	3830
55	Andhra Pradesh	Krishna	Nadupur	81.1293	16.2829	3900
56	Andhra Pradesh	Krishna	Anukuru	80.8189	16.3921	4230
57	Andhra Pradesh	Krishna	Kurumaddali	80.9261	16.3311	4600
58	Andhra Pradesh	Krishna	Upparigudem	81.1741	16.4083	5210
59	Andhra Pradesh	Krishna	Jagannathapuram	80.4099	16.7294	5370
60	Andhra Pradesh	Krishna	Palevada	81.2870	16.5795	6710
61	Andhra Pradesh	Krishna	Mandavalli	81.1637	16.5177	8920
62	Andhra Pradesh	Krishna	Kaikaluru1	81.2000	16.5449	9170
63	Andhra Pradesh	Kurnool	Banaganapalle	78.3433	15.3506	3170
64	Andhra Pradesh	Kurnool	Kodumuru	77.7667	15.6833	3600
65	Andhra Pradesh	Kurnool	Tungabhadra	79.3083	15.9372	5350
66	Andhra Pradesh	Kurnool	Gulyan	77.0649	15.3608	6350
67	Andhra Pradesh	Kurnool	Naganathanahalli	77.2333	15.5667	6540
68	Andhra Pradesh	Kurnool	Veldurti	77.9249	15.5463	9650
69	Andhra Pradesh	Kurnool	Bapuram1	77.1489	15.3486	11290
70	Andhra Pradesh	Nellore	Tadaparthi-Alt	79.7500	14.9667	3410
71	Andhra Pradesh	Nellore	Tikkavaram	79.8617	14.1278	4620
72	Andhra Pradesh	Nellore	Krishnapuram	79.9689	13.7811	5860
73	Andhra Pradesh	Prakasham	Vetapalem	80.3178	15.8867	3100
74	Andhra Pradesh	Prakasham	Thokapalle	79.2849	15.8846	3220
75	Andhra Pradesh	Prakasham	Ravipadu	79.1519	15.5732	3300
76	Andhra Pradesh	Prakasham	Suryavaripalli (Bedusupalle)	78.9656	15.2758	3390
77	Andhra Pradesh	Prakasham	Bestavaripeta	79.0553	15.5144	3650
78	Andhra Pradesh	Prakasham	Neethalapdu	80.3178	15.8867	3790
79	Andhra Pradesh	Prakasham	Donakonda	79.4847	15.8331	4215
80	Andhra Pradesh	Prakasham	Dhupadu	79.3669	15.9164	4362
81	Andhra Pradesh	Prakasham	Maddipadu	80.0183	15.6250	4400
82	Andhra Pradesh	Prakasham	Santamaguluru Pz	78.1114	14.1269	4419
83	Andhra Pradesh	Prakasham	Umamaheswarapuram	79.8265	15.8385	5000
84	Andhra Pradesh	Prakasham	Kakarla	79.1100	15.6500	5022
85	Andhra Pradesh	Prakasham	Guttalaumadivrm	79.5581	16.0164	8800
86	Andhra Pradesh	Prakasham	Pedda Alavalapadu	79.6267	15.3272	13560
87	Andhra Pradesh	Srikakulam	Aldu	84.1131	18.7575	3030
88	Andhra Pradesh	Srikakulam	Naupada	84.5475	18.8628	3260
89	Andhra Pradesh	Srikakulam	Heeramandalam	83.9667	18.6667	4500
90	Andhra Pradesh	Vijayanagram	Denkada	83.6711	18.2106	3146
91	Andhra Pradesh	Vijayanagram	Konda Thamarapalli	83.3536	18.3539	3700
92	Andhra Pradesh	Vijayanagram	Jagaram	83.2256	18.0794	3736
93	Andhra Pradesh	Visakapatnam	Kothakota	82.7858	17.8431	3740
94	Andhra Pradesh	West Godavari	Kolamuru (Pamulaparu)	81.4672	16.6322	3000
95	Andhra Pradesh	West Godavari	Munipalli	81.7143	16.8548	3330
96	Andhra Pradesh	West Godavari	Sarepalle	81.5051	16.5557	3960
97	Andhra Pradesh	West Godavari	Pentapadu	81.5264	16.7859	5020
98	Andhra Pradesh	West Godavari	Narsimhapuram	81.5019	16.5583	10000
99	Assam	Hojai	Lumding	93.1745	25.7588	5259
100	Assam	Hojai	Lumding	93.1745	25.7588	5259
101	Bihar	E Champaran	Bhakatij Tola	85.1092	26.7861	3328
102	Bihar	E.Champaran	Chatia	85.0728	26.7033	3155
103	Bihar	Jehanabad	Kako	85.0633	25.2286	3076
104	Bihar	Nalanda	Bihar Sharif (Rly Stn)	85.5389	25.2017	3009
105	Bihar	Nalanda	Bhui	85.4183	25.1058	3310

S.No.	State	District	Location	Long	Lat	EC > 3000 µS/cm
106	Bihar	Samastipur	Kishanpur1	85.8438	25.9276	3068
107	Delhi	Delhi	Chhawala Pz	77.0094	28.5464	3126
108	Delhi	Delhi	Sultanpur Dabas	77.0356	28.7650	3210
109	Delhi	Delhi	Daulatpur Pz	76.9653	28.5431	3290
110	Delhi	Delhi	Alipur Garhi	77.1244	28.7981	3440
111	Delhi	Delhi	Surheda	76.9342	28.6011	3445
112	Delhi	Delhi	Mundela Kalan Pz	76.8933	28.6064	3642
113	Delhi	Delhi	Hareoli	77.0083	28.8319	3654
114	Delhi	Delhi	Rani Khera Dw	77.0250	28.7069	3766
115	Delhi	Delhi	Singhola	77.1294	28.8433	3826
116	Delhi	Delhi	Baprola Dw	77.0167	28.6500	4054
117	Delhi	Delhi	Bankner Pz	77.0736	28.8514	4075
118	Delhi	Delhi	Najafgarh Town	77.0006	28.6147	4229
119	Delhi	Delhi	Raota	76.9042	28.5181	4340
120	Delhi	Delhi	Ujwah Pz	76.9142	28.5767	4562
121	Delhi	Delhi	Bakoli	77.1517	28.8153	4697
122	Delhi	Delhi	Hiran Kudna	76.9942	28.6822	4811
123	Delhi	Delhi	Singhu Village	77.1311	28.8533	5095
124	Delhi	Delhi	Bhalaswa Lake	77.1628	28.7364	5316
125	Delhi	Delhi	Daryapur Khurd	76.9086	28.5342	5752
126	Delhi	Delhi	Auchandi Pz	76.9972	28.8194	7146
127	Delhi	Delhi	Shikarpur Deep	76.9533	28.5244	7249
128	Delhi	Delhi	Tagore Garden	77.1128	28.6439	7417
129	Delhi	Delhi	Sandesh Vihar	77.1461	28.6950	8679
130	Delhi	Delhi	Barwala	77.0625	28.7583	9623
131	Dnh	Diu	Zolawadi	70.9306	20.7242	12890
132	Gujarat	Ahmedabad	Tagadi1	71.9467	22.2971	3790
133	Gujarat	Ahmedabad	Viramgam2	72.0384	23.1367	6920
134	Gujarat	Ahmedabad	Kumarkhan	72.0207	22.9006	11870
135	Gujarat	Amreli	Mandal	71.5793	21.0994	4700
136	Gujarat	Amreli	Devaliya	71.2505	21.5277	4900
137	Gujarat	Amreli	Bhuva	71.3596	21.4277	5000
138	Gujarat	Amreli	Bherai	71.4868	20.9740	5122
139	Gujarat	Amreli	Sanaria	71.4319	21.5501	6050
140	Gujarat	Anand	Kansari1	72.6516	22.3413	5223
141	Gujarat	Arvali	Boral	73.2150	23.1291	3080
142	Gujarat	Banaskantha	Gangodra	72.3647	24.4397	4220
143	Gujarat	Banaskantha	Dudhva	71.6690	24.4794	6225
144	Gujarat	Bharuch	Sajod	72.9108	21.6192	3261
145	Gujarat	Bharuch	Kavi	72.6367	22.1954	3710
146	Gujarat	Bharuch	Navetha	72.8281	21.7091	3780
147	Gujarat	Bharuch	Sahol	72.8184	21.4446	3940
148	Gujarat	Bharuch	Jambusar2	72.8086	22.0494	4375
149	Gujarat	Bharuch	Tankari	72.6691	21.9882	6860
150	Gujarat	Bhavnagar	Ghogha	72.2817	21.6803	3120
151	Gujarat	Bhavnagar	Vallbhipur	71.8784	21.9004	4460
152	Gujarat	Bhavnagar	Mahuva	71.7470	21.1000	5130
153	Gujarat	Bhavnagar	Ukharala	71.8867	21.7700	10030
154	Gujarat	Botad	Barvala	71.8942	22.1624	6280
155	Gujarat	Chhota Udepur	Govindpura	73.7400	22.2155	5430
156	Gujarat	Devbhoomi Dwarka	Gorinja	69.0664	22.1593	3103
157	Gujarat	Devbhoomi Dwarka	Gurgadh	69.1909	22.1947	3554
158	Gujarat	Devbhoomi Dwarka	Kalyanpur	69.0542	22.3076	4966
159	Gujarat	Devbhoomi Dwarka	Khakharda	69.3721	22.1048	5119
160	Gujarat	Devbhoomi Dwarka	Gojines	69.2036	22.0238	5572

S.No.	State	District	Location	Long	Lat	EC > 3000 μ S/cm
161	Gujarat	Devbhumi Dwarka	Vamansa	69.1887	22.0840	3052
162	Gujarat	Devbhumi Dwarka	Bhogat1	69.2443	21.9905	3061
163	Gujarat	Devbhumi Dwarka	Aramda	69.0350	22.4275	3470
164	Gujarat	Devbhumi Dwarka	Lambha 1	69.3084	21.9113	3816
165	Gujarat	Devbhumi Dwarka	Samrasar1	69.1063	22.3699	4943
166	Gujarat	Devbhumi Dwarka	Hanzdapur	69.4368	22.1889	5268
167	Gujarat	Devbhumi Dwarka	Mojap	68.9796	22.3615	5339
168	Gujarat	Devbhumi Dwarka	Varwada	68.9615	22.2977	11870
169	Gujarat	Gir Somnath	Nadiya Mandavi	71.0121	20.7425	3720
170	Gujarat	Jamnagar	Kesiya	70.3971	22.6966	4453
171	Gujarat	Jamnagar	Jambuda	70.2064	22.5215	4533
172	Gujarat	Jamnagar	Bedanpur	70.3125	22.6875	10950
173	Gujarat	Jamnagar	Hadiyana	70.2659	22.6118	13980
174	Gujarat	Junagadh	Bantva	70.0896	21.4911	3025
175	Gujarat	Junagadh	Kanek	70.2439	21.0360	3665
176	Gujarat	Junagadh	Shardagram	70.1431	21.1038	5304
177	Gujarat	Junagadh	Arena	70.1771	21.0808	5927
178	Gujarat	Junagadh	Khorada1	70.1876	21.0722	6113
179	Gujarat	Junagadh	Osa	70.0642	21.3729	12380
180	Gujarat	Kachchh	Karagoga	69.6625	22.9417	3140
181	Gujarat	Kachchh	Lodai	69.8917	23.4000	3924
182	Gujarat	Kachchh	Tera	68.9472	23.2833	4148
183	Gujarat	Kachchh	Ratanpur Khadir	70.3631	23.8608	4149
184	Gujarat	Kachchh	Kotaya	69.0750	23.0417	4156
185	Gujarat	Kachchh	Samkhiari	70.5083	23.3000	4636
186	Gujarat	Kachchh	Vadala	69.8556	22.9161	4979
187	Gujarat	Kachchh	Mothala	69.1250	23.2083	5308
188	Gujarat	Kachchh	Shinaya	70.0542	23.0333	5795
189	Gujarat	Kachchh	Khavda	69.7306	23.8389	6234
190	Gujarat	Kachchh	Sukhpar	69.6167	23.2083	6779
191	Gujarat	Kachchh	Bambhdai	69.0828	22.9389	7026
192	Gujarat	Kachchh	Kharai_1	68.6856	23.4631	7162
193	Gujarat	Kachchh	Devisar	69.3292	23.4028	7493
194	Gujarat	Kheda	Ladvel	73.1262	22.9086	3480
195	Gujarat	Kheda	Muliyad	73.1497	22.7908	7589
196	Gujarat	Kutchch	Dolatpar	68.8936	23.5978	3874
197	Gujarat	Kutchch	Nani Tumbdi	69.5492	22.9961	4195
198	Gujarat	Mahesana	Dharpura	72.1118	23.5440	3800
199	Gujarat	Mahesana	Maguna	72.2904	23.5772	4000
200	Gujarat	Mahesana	Dasaj	72.4465	23.8445	4105
201	Gujarat	Morbi	Mathak	71.0615	22.8425	3999
202	Gujarat	Morbi	Modpar1	70.6625	22.9017	4700
203	Gujarat	Morbi	Halvad2	71.1854	23.0196	4766
204	Gujarat	Morbi	Amar Nagar	70.8244	22.9348	7684
205	Gujarat	Navsari	Chinnam	72.8830	20.9986	3075
206	Gujarat	Navsari	Abrama	72.9033	20.8606	3700
207	Gujarat	Patan	Gochanad	71.6244	23.7708	9451
208	Gujarat	Patan	Moti Chander	71.7806	23.5944	25940
209	Gujarat	Porbandar	Ratia	69.8213	21.4163	3156
210	Gujarat	Porbandar	Hanumangadh1	69.8024	21.7955	3285
211	Gujarat	Porbandar	Visavada	69.4538	21.7752	3340
212	Gujarat	Porbandar	Bhavpura	69.4030	21.8134	3704
213	Gujarat	Porbandar	Bhoddar	69.8949	21.5751	4365
214	Gujarat	Porbandar	Kuchhadi	69.5489	21.6810	4450
215	Gujarat	Porbandar	Kutiyana1	70.0113	21.6284	6002

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
216	Gujarat	Porbandar	Mojiwana	69.5743	21.8600	6515
217	Gujarat	Porbandar	Oddar	69.6921	21.5529	7002
218	Gujarat	Porbandar	Babda	69.5903	21.7406	7455
219	Gujarat	Rajkot	Kamlapur	71.1999	22.1382	3131
220	Gujarat	Rajkot	Jetpur Pithad.	70.6408	21.7835	4083
221	Gujarat	Rajkot	Ganod	70.1693	21.6888	5853
222	Gujarat	Rajkot	Movaiya	70.6275	22.4579	7177
223	Gujarat	Sabarkantha	Khedbramha_1	73.0276	24.0541	3560
224	Gujarat	Sabarkantha	Silwad	73.1241	24.0128	5040
225	Gujarat	Surendranagar	Dhama	71.6715	23.3961	3037
226	Gujarat	Surendranagar	Surendranagar2	71.6167	22.7176	3121
227	Gujarat	Surendranagar	Moti Majethi	71.8853	23.0865	3606
228	Gujarat	Surendranagar	Ratanpur1	71.2747	22.8555	4032
229	Gujarat	Surendranagar	Gadah	71.4000	22.6278	4070
230	Gujarat	Surendranagar	Kherwa	71.7438	23.0006	4093
231	Gujarat	Surendranagar	Pipli	71.7123	23.0687	4385
232	Gujarat	Surendranagar	Dhajala	71.3978	22.3806	4545
233	Gujarat	Surendranagar	Piprali	71.3117	22.3953	5018
234	Gujarat	Surendranagar	Vaghela	71.6569	22.6578	5224
235	Gujarat	Surendranagar	Moti Moladi	71.1040	22.4179	5686
236	Gujarat	Surendranagar	Muli	71.4644	22.6390	5942
237	Gujarat	Surendranagar	Rajsitapur	71.5967	22.8380	6309
238	Gujarat	Surendranagar	Nava Sudamda	71.4358	22.5397	6321
239	Gujarat	Surendranagar	Limbdi1	71.8100	22.5700	6466
240	Gujarat	Surendranagar	Gangad	71.9728	22.9489	12070
241	Gujarat	Surendranagar	Kharaghoda	71.7522	23.1877	24790
242	Gujarat	Vadodara	Vejpur2	73.3539	22.7435	3650
243	Gujarat	Valsad	Magod	72.9049	20.5659	4667
244	Haryana	Bhiwani	Lohali	76.0460	28.7000	3100
245	Haryana	Bhiwani	Bhawani Khera	76.0420	28.9360	3300
246	Haryana	Bhiwani	Haluwas	76.1670	28.7330	3440
247	Haryana	Bhiwani	Tosham	75.9170	28.8750	4000
248	Haryana	Bhiwani	Boond Kalan	76.3670	28.7810	4171
249	Haryana	Bhiwani	Dhanana	76.1680	28.9380	4500
250	Haryana	Bhiwani	Bamla	76.2450	28.8070	4800
251	Haryana	Bhiwani	Tigrana	76.1500	28.8420	5200
252	Haryana	Faridabad	Tigaon	77.3900	28.3470	3282
253	Haryana	Faridabad	Bhujal Bhawan, NH-IV	77.3140	28.4180	4015
254	Haryana	Faridabad	Ballabgarh	77.3350	28.3470	4461
255	Haryana	Faridabad	Sikri	77.2879	28.2755	6202
256	Haryana	Faridabad	Pali	77.2440	28.3810	10006
257	Haryana	Faridabad	Ferozpur Kalan	77.2380	28.3030	11070
258	Haryana	Fatehabad	Talwara	75.8060	29.7880	5300
259	Haryana	Gurugram	Kherakhurampur	76.7820	28.4470	3252
260	Haryana	Gurugram	Halley Mandi	76.7611	28.3450	3438
261	Haryana	Gurugram	Jhanjrola	77.0040	28.4830	3791
262	Haryana	Gurugram	Mauzabad	76.6900	28.2970	8362
263	Haryana	Gurugram	Machana	76.7500	28.4080	9880
264	Haryana	Gurugram	Sewari	76.7230	28.4630	10520
265	Haryana	Hisar	Barwala	75.9170	29.3870	3200
266	Haryana	Hisar	Kirori	75.8000	29.3000	3400
267	Haryana	Hisar	Kirtan	75.5470	29.2210	3600
268	Haryana	Hisar	Khanda Kheri	76.2330	29.2090	3780
269	Haryana	Hisar	Banbhauri	76.0500	29.4000	3900
270	Haryana	Hisar	Dhansu	75.4920	29.2780	4870

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
271	Haryana	Hisar	Umra	75.9130	29.0530	6000
272	Haryana	Hisar	Karnoh	75.7570	29.3730	8600
273	Haryana	Hisar	Kapro	76.1130	29.3790	13400
274	Haryana	Jhajjar	Bigoa	76.4280	28.6570	3096
275	Haryana	Jhajjar	Mudsa	76.4730	28.3450	3400
276	Haryana	Jhajjar	Kulasi	76.9100	28.7740	3721
277	Haryana	Jhajjar	Wazirpur	76.5697	28.6830	4331
278	Haryana	Jhajjar	Dulhera	76.7880	28.6460	5529
279	Haryana	Jhajjar	Subnah	76.5710	28.4820	5621
280	Haryana	Jhajjar	Chuchakwas	76.5112	28.5980	9636
281	Haryana	Jhajjar	Chamanpura	76.6340	28.6910	10241
282	Haryana	Jind	Kishanpura	76.3345	29.2953	3065
283	Haryana	Jind	Mohal Khera	76.1256	29.6262	3414
284	Haryana	Jind	Rojhala	76.6051	29.3647	4546
285	Haryana	Jind	Chhabri	76.4510	29.2640	4734
286	Haryana	Jind	Dorana	76.4722	29.5276	4836
287	Haryana	Jind	Khatkaran	76.2450	29.4030	4836
288	Haryana	Jind	Julana	76.4049	29.1318	5340
289	Haryana	Jind	Baroda	76.2184	29.4311	7081
290	Haryana	Kaithal	Kalayat	76.2528	29.6792	3230
291	Haryana	Kaithal	Jakholi	76.4290	29.6580	3405
292	Haryana	Kaithal	Padla	76.3000	30.1000	3432
293	Haryana	Kaithal	Simla	76.2149	29.6348	3521
294	Haryana	Kaithal	Kithana	76.3930	29.5460	5420
295	Haryana	Karnal	Khada Kheri	76.6442	29.5637	6256
296	Haryana	Mahendragarh	Khatodra	76.0900	28.2820	4269
297	Haryana	Mahendragarh	Narnaul(Hot Spot)	76.1066	28.0501	5365
298	Haryana	Mewat	Indri	77.1003	28.1892	4680
299	Haryana	Mewat	Akaira	77.0040	28.0080	5610
300	Haryana	Mewat	Gulalta	77.1790	27.9170	6080
301	Haryana	Mewat	Malab	77.0110	28.0420	6190
302	Haryana	Mewat	Kheri Kankar	77.0708	28.1874	6250
303	Haryana	Mewat	Nagina	76.9830	27.9170	10090
304	Haryana	Palwal	Lalwa	77.4040	28.1380	3160
305	Haryana	Palwal	Jaindapur	77.2390	28.2040	3881
306	Haryana	Palwal	Mandkola	77.1801	28.1346	4301
307	Haryana	Palwal	Theraka	77.4331	28.1253	4334
308	Haryana	Palwal	Hodal	77.3500	27.8830	4502
309	Haryana	Palwal	Tumsara	77.3420	28.0080	5798
310	Haryana	Palwal	Baghola	77.3080	28.2210	7184
311	Haryana	Palwal	Hathin	77.2420	28.0460	7440
312	Haryana	Palwal	Lakhnakha	77.1880	28.0350	7941
313	Haryana	Palwal	Kot	77.2290	27.9580	9281
314	Haryana	Panipat	Untala	76.8490	29.3940	3406
315	Haryana	Panipat	Puthar	76.8720	29.2230	3480
316	Haryana	Panipat	Israna	76.8454	29.2735	3805
317	Haryana	Panipat	Lohari	76.8390	29.3583	5471
318	Haryana	Rewari	Lukhi	76.3625	28.3859	3180
319	Haryana	Rewari	Guriani	76.5400	28.3560	3182
320	Haryana	Rewari	Bawal	76.5794	28.0734	4191
321	Haryana	Rewari	Sangwari	76.6836	28.1637	4471
322	Haryana	Rewari	Balawas	76.5290	28.1040	4648
323	Haryana	Rewari	Chimnawas	76.4983	28.2143	7820
324	Haryana	Rohtak	Nidhana	76.3740	29.0114	3198
325	Haryana	Rohtak	Maham	76.2946	29.9640	3540

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
326	Haryana	Rohtak	Madina	76.4339	28.9390	3961
327	Haryana	Rohtak	Samargopalpur	76.5130	28.9640	10121
328	Haryana	Sirsa	Mangiana	74.8040	29.9210	3000
329	Haryana	Sirsa	Taruana	75.0080	29.8250	4500
330	Haryana	Sirsa	Shergarh	74.6760	29.9260	6000
331	Haryana	Sonipat	Bhunderi	76.6142	29.1001	3034
332	Haryana	Sonipat	Farmana	76.8125	28.9815	3280
333	Haryana	Sonipat	Ahulana	76.6400	29.1100	3374
334	Haryana	Sonipat	Rohat	76.9710	28.9360	3501
335	Haryana	Sonipat	Janti Khurd	77.1514	28.8491	3623
336	Haryana	Sonipat	Khanpur Kalan	76.7960	29.1510	3771
337	Haryana	Sonipat	Bichpuri	76.6629	29.2024	3881
338	Haryana	Sonipat	Barwasni	76.9590	29.4180	4380
339	Haryana	Sonipat	Mundlana	76.7628	29.2080	4481
340	Haryana	Sonipat	Bohela	76.8540	29.0800	8080
341	Karnataka	Bagalkot	Badagandi	75.9406	15.9426	3100
342	Karnataka	Bagalkot	Kodihal	75.9657	15.9617	3250
343	Karnataka	Bagalkot	Kumbarhal	75.1518	16.3839	3350
344	Karnataka	Bagalkot	Mudhol	75.9452	16.0553	3680
345	Karnataka	Bagalkot	Patadkal	75.2908	16.3250	3830
346	Karnataka	Bagalkot	Savalgi	76.1231	15.9758	3870
347	Karnataka	Bagalkot	Binjawadige	75.7527	16.0466	4290
348	Karnataka	Bagalkot	Tumb	76.2043	16.1026	5030
349	Karnataka	Bagalkot	Gorbal	75.5451	16.0108	7900
350	Karnataka	Bagalkot	Algur	76.1075	16.0653	9620
351	Karnataka	Bagalkot	Guledgudda	75.5299	16.3760	10600
352	Karnataka	Ballari	Tekalakota(A)	76.8797	15.5361	3060
353	Karnataka	Ballari	Sirigeri	76.8379	15.4405	4740
354	Karnataka	Belagavi	Naslapur	74.6791	16.5323	3160
355	Karnataka	Belagavi	Nandagaon	75.1284	16.6797	4180
356	Karnataka	Belagavi	Rupnal	74.6449	16.5067	5100
357	Karnataka	Belagavi	Mole	74.9233	16.7189	7850
358	Karnataka	Bijapur	Nebgeri	76.1129	16.2833	3110
359	Karnataka	Bijapur	Minajigi	76.2748	16.4725	3150
360	Karnataka	Bijapur	Korahalli	76.2263	17.0283	3200
361	Karnataka	Bijapur	Mileshwara(Alternative)	76.3386	16.4667	3210
362	Karnataka	Bijapur	Kannolli	76.1490	16.8580	3660
363	Karnataka	Bijapur	Devanagaon	76.3275	17.1634	3730
364	Karnataka	Bijapur	Bhudihaldon	76.1455	16.7104	4130
365	Karnataka	Bijapur	Bavur	76.2517	16.4441	4780
366	Karnataka	Bijapur	Vibhutihalli	76.1716	17.0969	4930
367	Karnataka	Bijapur	Sathihal(Santhal)	76.0572	16.7332	5110
368	Karnataka	Bijapur	Sawalsanga	75.7431	17.1135	5204
369	Karnataka	Bijapur	Honaganahalli	75.7337	16.6815	5240
370	Karnataka	Bijapur	Khatijapur	75.6760	16.7651	9590
371	Karnataka	Chikmagaluru	Ajjampura	76.0092	13.7261	3080
372	Karnataka	Chitradurga	Belagur	76.2930	13.6280	3080
373	Karnataka	Chitradurga	Maskallu	76.6900	13.9880	3370
374	Karnataka	Chitradurga	Hartikote	76.6490	14.0710	3750
375	Karnataka	Chitradurga	Molakalmuru	76.7500	14.7160	3990
376	Karnataka	Hassan	Yachegowdanahalli	76.3449	13.4924	4890
377	Karnataka	Kolar	Kurugal A	77.9877	13.2042	3120
378	Karnataka	Koppal	K Hosur	76.2600	15.8200	3310
379	Karnataka	Koppal	Sanganhal	75.9800	15.5700	4710
380	Karnataka	Koppal	Itagi	76.0100	15.3700	5110

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
381	Karnataka	Raichur	Hanchinal	76.6814	15.6722	3650
382	Karnataka	Raichur	Jakkaladinni	77.0658	16.1822	4295
383	Karnataka	Raichur	Hirekotankal	76.9500	15.9600	6100
384	Karnataka	Tumkur	Huliyar	76.5470	13.5840	3180
385	Karnataka	Tumkur	Medihalli	76.5280	13.3950	4050
386	Karnataka	Tumkur	Tiptur (New Well)	76.4790	13.2590	4194
387	Karnataka	Vijayanagara	Yeshwanthnagar	76.4932	15.0432	3710
388	Karnataka	Vijayanagara	Danapura	76.3678	15.1741	3870
389	Karnataka	Vijayanagara	Magala	75.7955	14.9941	4070
390	Karnataka	Yadgir	Managinahal	77.0370	16.7172	4860
391	Karnataka	Yadgir	Khembhavi	76.5326	16.6483	6700
392	Madhya Pradesh	Bhind	Mehgaon	78.6010	26.4980	3054
393	Madhya Pradesh	Bhind	Balaji	78.9800	26.2960	3573
394	Madhya Pradesh	Bhind	Lavan	78.7310	26.5210	3595
395	Madhya Pradesh	Bhind	Phuph	78.8790	26.6430	4144
396	Madhya Pradesh	Dhar	Dhulsar	74.8690	22.2050	3110
397	Madhya Pradesh	Gwalior	Jahangirpur	78.2906	26.2756	3220
398	Madhya Pradesh	Gwalior	Dongarapur	77.9640	25.8220	3247
399	Madhya Pradesh	Gwalior	Suro	78.0417	26.2499	3620
400	Madhya Pradesh	Indore	Sanwer	75.8280	22.9710	3187
401	Madhya Pradesh	Neemuch	Girdola	74.9320	24.4620	4490
402	Madhya Pradesh	Shivpuri	Sehore	78.1060	25.6650	3581
403	Madhya Pradesh	Ujjain	Kaiytha	76.0183	23.2331	3150
404	Maharashtra	Ahmednagar	Banpimpri	74.8667	18.8333	3248
405	Maharashtra	Ahmednagar	Jakhangaon	74.6306	19.1056	3735
406	Maharashtra	Ahmednagar	Rahata	74.4833	19.7167	3930
407	Maharashtra	Ahmednagar	Dahigaon	74.8069	18.9625	4286
408	Maharashtra	Ahmednagar	Chikhale	74.7167	18.8667	5627
409	Maharashtra	Ahmednagar	Ghotan	75.3000	19.4000	6611
410	Maharashtra	Akola	Wadegaon	77.0675	20.4686	3403
411	Maharashtra	Akola	Wyala	76.8875	20.6750	5119
412	Maharashtra	Akola	Andura1	76.8528	20.8833	5203
413	Maharashtra	Akola	Akola	77.0017	20.7367	7899
414	Maharashtra	Amravati	Samda Kasmpur	77.2631	20.9269	3034
415	Maharashtra	Amravati	Yevda	77.4586	20.9947	6284
416	Maharashtra	Aurangabad	Taherpur	75.3353	19.6511	3339
417	Maharashtra	Aurangabad	Tunki	74.8500	20.1333	8173
418	Maharashtra	Beed	Khadkhat	75.1500	18.6667	3104
419	Maharashtra	Beed	Tintarvani-1	75.5078	19.1750	3238
420	Maharashtra	Beed	Manur	75.3167	19.0667	9776
421	Maharashtra	Buldhana	Kingaon Raja	76.2444	19.9861	3158
422	Maharashtra	Chandrapur	Aksapur	79.6333	19.7583	4639
423	Maharashtra	Dhule	Dhavda	74.4925	21.3378	3570
424	Maharashtra	Jalna	Jafrabad	76.0167	20.2000	6381
425	Maharashtra	Nagpur	Mouda-1	79.4003	21.1347	3052
426	Maharashtra	Nagpur	Nagalwadi	79.0167	21.5667	3057
427	Maharashtra	Nashik	Marhal Kh	74.1822	19.7800	3756
428	Maharashtra	Nashik	Jalgaon	74.1111	20.0639	4638
429	Maharashtra	Parbhani	Panchegaon-1	76.7094	19.5558	9294
430	Maharashtra	Sangli	Yevali	74.5167	17.0667	3966
431	Maharashtra	Solapur	Ranzani	75.4000	17.6167	3403
432	Maharashtra	Solapur	Madha	75.5164	18.0383	6004
433	Maharashtra	Wardha	Khandali	78.9256	20.7375	3267
434	Odisha	Ganjam	Rambha	85.0958	19.5269	3030
435	Odisha	Ganjam	Tanganapalli 1	84.8797	19.3744	3098

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
436	Odisha	Khordha	Kuha	85.7967	20.2342	3250
437	Punjab	Bhatinda	Gulabgarh	75.0106	30.1443	3040
438	Punjab	Bhatinda	Bhagi Bandar	75.0697	30.0251	3325
439	Punjab	Bhatinda	Balluana	74.7839	30.2237	5405
440	Punjab	Faridkot	Mumara	74.5885	30.7935	3200
441	Punjab	Faridkot	Sukhanwala	74.6394	30.6382	3327
442	Punjab	Faridkot	Baja Khana	74.9772	30.4547	3450
443	Punjab	Faridkot	Killi	74.5461	30.7861	3923
444	Punjab	Faridkot	Karir Wali	74.8273	30.4056	4155
445	Punjab	Faridkot	Sadiq	74.5856	30.7088	4686
446	Punjab	Faridkot	Mehmunna Sadiq	74.6381	30.6957	5812
447	Punjab	Fazilka	Kauranwali	74.0561	30.3829	3130
448	Punjab	Fazilka	Deepulana	74.1346	30.4607	3910
449	Punjab	Fazilka	Sitogano	74.3602	30.0290	5320
450	Punjab	Fazilka	Khuyan Sarwar	74.0805	30.1129	5817
451	Punjab	Fazilka	Sohangarh(Coloured Samples)	74.3892	30.6003	8022
452	Punjab	Fazilka	Abohar	74.1901	30.1480	8768
453	Punjab	Mansa	Budhlanda-1	75.5176	29.9317	3327
454	Punjab	Mansa	Budhlanda	75.5444	29.9317	3455
455	Punjab	Mansa	Raipur	75.2573	29.9041	4455
456	Punjab	Muktsar	Kabarwala	74.4097	30.1931	3027
457	Punjab	Muktsar	Doda	74.6370	30.3816	4042
458	Punjab	Muktsar	Muktsar	74.5149	30.4714	4060
459	Punjab	Muktsar	Bhalaiana	74.7133	30.3301	6078
460	Punjab	Muktsar	Sheranwali	74.4644	30.0318	6098
461	Punjab	Muktsar	Dohak	74.6009	30.6324	6434
462	Punjab	Sas Nagar	Sirsini	76.7710	30.4540	4586
463	Rajasthan	Ajmer	Tabiji	74.6170	26.3630	3220
464	Rajasthan	Ajmer	Lamana	74.4920	26.2330	3350
465	Rajasthan	Ajmer	Mangaliyawas	74.5080	26.2770	3520
466	Rajasthan	Alwar	Kathumar	77.0778	27.3161	6330
467	Rajasthan	Alwar	Lachmangarh	76.8600	27.3500	7000
468	Rajasthan	Alwar	Ramgarh1	76.8140	27.5940	7900
469	Rajasthan	Banswara	Maudi Maska	74.3100	23.1500	4250
470	Rajasthan	Barmer	Thob	72.3580	26.0500	3000
471	Rajasthan	Barmer	Sedwa	71.1280	25.0670	3220
472	Rajasthan	Barmer	Sanwlor	71.2333	25.5858	3330
473	Rajasthan	Barmer	Santara	71.9680	25.9980	3560
474	Rajasthan	Barmer	Kerala	71.9016	25.9970	3590
475	Rajasthan	Barmer	Gadra Road	70.6390	25.7400	3850
476	Rajasthan	Barmer	Sayla	71.7130	26.0274	4000
477	Rajasthan	Barmer	Gujrokabera	71.3320	26.2018	4230
478	Rajasthan	Barmer	Kumarokidhani	72.1200	26.2000	4440
479	Rajasthan	Barmer	Bhadka	71.3500	25.8833	4450
480	Rajasthan	Barmer	Sasio Ka Kua	71.4125	25.7042	4580
481	Rajasthan	Barmer	Bhuginji Ka Meetha	72.1257	25.5149	4600
482	Rajasthan	Barmer	Derasar	71.1630	25.7760	4710
483	Rajasthan	Barmer	Dhorimana	71.4352	25.2344	4815
484	Rajasthan	Barmer	Bisukalan	71.2780	26.2410	6150
485	Rajasthan	Barmer	Balotra	72.2404	25.8218	6200
486	Rajasthan	Barmer	Gudamalani	71.6988	25.2140	6310
487	Rajasthan	Barmer	Sanawara	71.4000	25.4800	6320
488	Rajasthan	Barmer	Sawau Padam Singh	71.8067	26.1503	6570
489	Rajasthan	Barmer	Thumbli	72.4886	26.2036	8470

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
490	Rajasthan	Barmer	Siyagatala	70.8653	25.3375	8910
491	Rajasthan	Barmer	Khara Mahecha	72.0265	25.5103	9110
492	Rajasthan	Barmer	Arniyali	71.9680	25.4670	11930
493	Rajasthan	Barmer	Loonakalan	71.9829	25.4481	12410
494	Rajasthan	Barmer	Panchla	70.1670	25.9920	15490
495	Rajasthan	Barmer	Koloo	71.7130	26.0274	16410
496	Rajasthan	Barmer	Meghwalo Ki Basti	71.7731	26.0282	21250
497	Rajasthan	Barmer	Ramsar	70.8719	25.7303	22750
498	Rajasthan	Bharatpur	Chiksana	77.6667	27.1833	3100
499	Rajasthan	Bharatpur	Jurhra	77.2270	27.7820	3880
500	Rajasthan	Bharatpur	Nagar	77.1000	27.4170	3930
501	Rajasthan	Bharatpur	Salabad	77.3150	26.9786	4660
502	Rajasthan	Bharatpur	Pahari	77.0830	27.7000	5200
503	Rajasthan	Bharatpur	Nadbai	77.2130	27.2080	5220
504	Rajasthan	Bharatpur	Gopalgarh	77.0633	27.6547	6380
505	Rajasthan	Bharatpur	Sewar	77.4403	27.1822	6670
506	Rajasthan	Bharatpur	Kaman	77.2697	27.6572	7340
507	Rajasthan	Bharatpur	Ludhawai_Gwd	77.3950	27.1750	7350
508	Rajasthan	Bharatpur	Deeg1	77.3330	27.4670	11840
509	Rajasthan	Bhilwara	Sawaipur	74.8670	25.3070	3020
510	Rajasthan	Bhilwara	Kanchan-Kala	74.9060	25.7560	3160
511	Rajasthan	Bhilwara	Hurda	74.6881	25.9023	3460
512	Rajasthan	Bhilwara	Potlan	74.2174	25.1368	3460
513	Rajasthan	Bhilwara	Raila Road	74.6000	25.6330	3730
514	Rajasthan	Bhilwara	Dahimatha	74.3010	25.5280	3780
515	Rajasthan	Bhilwara	Nangpura	74.1880	25.4540	4000
516	Rajasthan	Bhilwara	Asind	74.3347	25.7328	4890
517	Rajasthan	Bhilwara	Malas	74.3294	25.5242	6420
518	Rajasthan	Bhilwara	Gulabpura	74.6700	25.9000	7000
519	Rajasthan	Bikaner	Kaloo	73.8853	28.3889	3100
520	Rajasthan	Bikaner	Karmisar	73.2803	28.0006	3510
521	Rajasthan	Bikaner	Lunkaransar	73.7500	28.4917	3920
522	Rajasthan	Bikaner	Lakhasar2	73.8710	28.0960	4010
523	Rajasthan	Bikaner	Sattasar	73.1920	28.5920	4300
524	Rajasthan	Bikaner	Kolayat	72.9540	27.8420	4810
525	Rajasthan	Bikaner	Godu	72.2970	27.9920	5250
526	Rajasthan	Bikaner	Manaria	73.7720	28.7580	5450
527	Rajasthan	Bikaner	Hariasar	73.8110	28.5760	5600
528	Rajasthan	Bikaner	Khara	73.3900	28.2000	8850
529	Rajasthan	Bikaner	Lakhusar	73.1920	28.3170	9370
530	Rajasthan	Bikaner	Khajuwala	72.5914	28.6931	11630
531	Rajasthan	Bikaner	Binjawari	73.4500	28.4670	17320
532	Rajasthan	Bundi	Dahi Khera	76.1670	25.5170	3000
533	Rajasthan	Bundi	Kapren	76.0740	25.3910	3200
534	Rajasthan	Bundi	Delunda	75.8670	25.4710	3500
535	Rajasthan	Chittaurgarh	Kapasan1	74.3080	24.8610	3590
536	Rajasthan	Churu	Shawa	74.8420	28.8750	3000
537	Rajasthan	Churu	Melusar	74.7380	28.5040	3200
538	Rajasthan	Churu	Rajgarh1	75.3750	28.6330	3400
539	Rajasthan	Churu	Bamboo	74.1170	27.7330	3740
540	Rajasthan	Churu	Mehrasar	74.5380	28.3570	4150
541	Rajasthan	Churu	Neema	75.4722	28.4667	4420
542	Rajasthan	Churu	Sardarshahar	74.4860	28.4390	4450
543	Rajasthan	Churu	Soniyasar	74.0208	27.7631	4600
544	Rajasthan	Churu	Bidasar	74.2830	27.8390	5210

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
545	Rajasthan	Churu	Binasar	74.8750	28.2630	6000
546	Rajasthan	Churu	Ratangarh	74.6039	28.0561	6450
547	Rajasthan	Churu	Rampura	74.8630	28.4670	6600
548	Rajasthan	Churu	Churu	74.9275	28.2955	7080
549	Rajasthan	Churu	Parihara	74.5619	27.9244	7120
550	Rajasthan	Churu	Bhojasar	74.5420	27.9720	7400
551	Rajasthan	Churu	Aspalsar	74.5044	28.5769	7620
552	Rajasthan	Churu	Tidiyasar	74.7540	28.0660	10720
553	Rajasthan	Churu	Sujangarh	74.4808	27.7069	11030
554	Rajasthan	Churu	Sirsala	75.1310	28.4330	12600
555	Rajasthan	Churu	Dudwa Khara	75.0790	28.4710	13620
556	Rajasthan	Churu	Dadrewa	75.2330	28.6690	14000
557	Rajasthan	Dausa	Dausa1	76.3260	26.8980	3820
558	Rajasthan	Dausa	Higetawari Dhani	77.0330	26.9000	4100
559	Rajasthan	Dausa	Lawan1	76.2170	26.7830	4120
560	Rajasthan	Dausa	Bapi	76.2920	26.9750	5300
561	Rajasthan	Dausa	Jasuta	76.3330	26.9670	6000
562	Rajasthan	Dausa	Mahuwa	76.9270	27.0490	6250
563	Rajasthan	Dhaulpur	Mangraul	77.9583	26.8167	3100
564	Rajasthan	Dhaulpur	Rajakhera	78.1706	26.9031	3170
565	Rajasthan	Dhaulpur	Dhaulpur	77.8917	26.7000	3200
566	Rajasthan	Dhaulpur	Saipau	77.7464	26.8217	3240
567	Rajasthan	Ganganagar	Ganeshgarh	73.9000	29.7460	3300
568	Rajasthan	Ganganagar	Karanpur1	73.4500	29.8170	3560
569	Rajasthan	Ganganagar	Suranwali	73.9170	29.6960	4350
570	Rajasthan	Ganganagar	Gharsana	73.0778	29.0251	8075
571	Rajasthan	Hanumangarh	Bolanwali	74.4100	29.8380	3020
572	Rajasthan	Hanumangarh	Munsari	75.0330	29.1000	3100
573	Rajasthan	Hanumangarh	Sangariya	74.4636	29.8123	3100
574	Rajasthan	Hanumangarh	Purabsar	74.2830	29.0330	4150
575	Rajasthan	Hanumangarh	Bhadra	75.1622	29.1176	4935
576	Rajasthan	Hanumangarh	Panditawali	74.2000	29.4130	5630
577	Rajasthan	Hanumangarh	Pallu	74.2000	28.9170	11180
578	Rajasthan	Hanumangarh	Dungrana	75.0970	29.0140	14000
579	Rajasthan	Jaipur	Didwata	75.7300	26.4940	3000
580	Rajasthan	Jaipur	Paota	76.0766	27.5846	3150
581	Rajasthan	Jaipur	Rasala	76.2030	27.1140	3150
582	Rajasthan	Jaipur	Parun	75.6070	26.5060	3600
583	Rajasthan	Jaipur	Bhojpura	75.6140	26.6220	3840
584	Rajasthan	Jaipur	Dawach	75.7540	26.5670	3930
585	Rajasthan	Jaipur	Choru	75.4500	26.5930	4320
586	Rajasthan	Jaipur	Kanarpura	75.5720	27.1840	4810
587	Rajasthan	Jaipur	Mozmabad	75.3630	26.6830	4940
588	Rajasthan	Jaipur	Sambhar	75.2200	26.9060	6430
589	Rajasthan	Jaipur	Lasariya	75.5090	26.5570	6620
590	Rajasthan	Jaipur	Nasnota	75.4430	26.8000	6790
591	Rajasthan	Jaipur	Madhorajpur	75.6560	26.5770	6910
592	Rajasthan	Jaipur	Majhi Renwal	75.6830	26.6960	8170
593	Rajasthan	Jaipur	Pallukhurd	75.3250	26.7360	11020
594	Rajasthan	Jaipur	Mangarwara	75.2780	26.6100	12410
595	Rajasthan	Jaisalmer	Gotaru	70.0380	27.3170	3020
596	Rajasthan	Jaisalmer	Kuria	70.4870	26.6190	3100
597	Rajasthan	Jaisalmer	Bhainsara	71.4920	26.6310	3120
598	Rajasthan	Jaisalmer	Chandan	71.3000	26.9920	3420
599	Rajasthan	Jaisalmer	Lawan	72.0500	26.8720	4000

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
600	Rajasthan	Jaisalmer	Chodahariya	70.5533	27.0600	4030
601	Rajasthan	Jaisalmer	Longewala	71.7667	27.1500	4350
602	Rajasthan	Jaisalmer	Shekhowala	71.4230	27.3300	4430
603	Rajasthan	Jaisalmer	Ghantiyali	71.4630	27.4520	4590
604	Rajasthan	Jaisalmer	Sankara	71.5818	26.7277	4600
605	Rajasthan	Jaisalmer	Jaisalmer	70.9100	26.9420	4670
606	Rajasthan	Jaisalmer	Luna Kalan	71.5710	26.6230	4670
607	Rajasthan	Jaisalmer	Nathu Ka Bera	70.4150	27.8110	4790
608	Rajasthan	Jaisalmer	Sribhadria	71.5500	27.0830	5600
609	Rajasthan	Jaisalmer	Kalewa	71.9040	26.8060	6350
610	Rajasthan	Jaisalmer	Rajgarh1	71.5450	26.5380	6810
611	Rajasthan	Jaisalmer	Tanot	70.3670	27.8000	8860
612	Rajasthan	Jaisalmer	Sadewala	70.2440	27.6350	11510
613	Rajasthan	Jaisalmer	Khariakua_Dw	70.3250	27.7170	13550
614	Rajasthan	Jalore	Lathermail	72.3461	25.0536	3020
615	Rajasthan	Jalore	Bhinmal	72.2625	25.0125	3500
616	Rajasthan	Jalore	Dhanawara	72.2022	24.9675	4370
617	Rajasthan	Jalore	Jalore	72.6306	25.3346	4535
618	Rajasthan	Jalore	Nimla	72.8660	25.5310	4550
619	Rajasthan	Jalore	Bhagalbhim	72.2227	25.0188	4900
620	Rajasthan	Jalore	Khanpur	72.3538	25.0303	5690
621	Rajasthan	Jalore	Bagra	72.6000	25.1922	6630
622	Rajasthan	Jalore	Halivav	71.5939	24.9911	7700
623	Rajasthan	Jalore	Bhagli	72.5958	25.2786	7810
624	Rajasthan	Jalore	Sanchoe	71.7946	24.7585	8500
625	Rajasthan	Jalore	Narta	72.2748	25.0883	11500
626	Rajasthan	Jhunjhunu	Nawalgarh	75.2533	27.8472	3010
627	Rajasthan	Jhunjhunu	Mandrela	75.4400	28.3130	3050
628	Rajasthan	Jhunjhunu	Birmi	75.1778	28.2000	4650
629	Rajasthan	Jhunjhunu	Alsisar	75.2931	28.3037	5780
630	Rajasthan	Jodhpur	Kumhara	73.5349	26.7296	3060
631	Rajasthan	Jodhpur	Devatra	73.3780	26.5100	3590
632	Rajasthan	Jodhpur	Kolu	72.1800	26.5500	3600
633	Rajasthan	Jodhpur	Bhavi	73.6067	26.2317	3660
634	Rajasthan	Jodhpur	Pipad City	73.5497	26.3792	3780
635	Rajasthan	Jodhpur	Kheri Salwa Uranium Hot Spot	73.3658	26.4352	4050
636	Rajasthan	Jodhpur	Bilara Block Hq	73.7106	26.1969	4430
637	Rajasthan	Jodhpur	Soyla	73.3375	26.8208	4450
638	Rajasthan	Jodhpur	Osian	72.8964	26.7411	4510
639	Rajasthan	Jodhpur	Shergarh	72.2794	26.3198	4530
640	Rajasthan	Jodhpur	Samdari Block Hq	72.5756	26.8488	4620
641	Rajasthan	Jodhpur	Chabon Ki Dhani Block Hq	73.1671	26.6314	4860
642	Rajasthan	Jodhpur	Nokhracharna	72.8900	27.2300	5030
643	Rajasthan	Jodhpur	Daarmi	73.6397	26.7339	5096
644	Rajasthan	Jodhpur	Nahar Singh Nagar	72.2860	26.3900	5110
645	Rajasthan	Jodhpur	Sargiya Kallan	73.5400	26.5400	5300
646	Rajasthan	Jodhpur	Mogra	73.0330	26.1170	5590
647	Rajasthan	Jodhpur	Borunda	73.7958	26.4692	5900
648	Rajasthan	Jodhpur	Dechupz	72.3277	26.7714	6230
649	Rajasthan	Jodhpur	Dhawa	72.7420	26.0580	6720
650	Rajasthan	Jodhpur	Ramdawas	73.3658	26.3658	7010
651	Rajasthan	Jodhpur	Bap	72.3462	27.3645	7870
652	Rajasthan	Jodhpur	Bisalpur	73.3140	26.2330	8080
653	Rajasthan	Jodhpur	Karani	72.8250	26.2720	8230

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
654	Rajasthan	Jodhpur	Hemnagar	72.7817	26.2961	9060
655	Rajasthan	Jodhpur	Benan	73.4210	26.3170	9150
656	Rajasthan	Jodhpur	Gangani	73.2120	26.5100	10680
657	Rajasthan	Jodhpur	Olvi	73.4580	26.2330	12650
658	Rajasthan	Jodhpur	Raron Ki Dhani	72.7750	26.1940	13160
659	Rajasthan	Jodhpur	Bhandu Kalan Uranium Hotspot	72.9015	26.1294	13930
660	Rajasthan	Jodhpur	Luni	73.0210	26.0000	15030
661	Rajasthan	Jodhpur	Binawas Uranium Hotspot	73.3782	26.2907	16020
662	Rajasthan	Jodhpur	Khatawas Uranium Hotspot	72.8027	26.1193	17900
663	Rajasthan	Jodhpur	Khudala	72.8320	26.1510	22920
664	Rajasthan	Jodhpur	Kukunda Uranium Hotspot	73.3223	26.3460	24290
665	Rajasthan	Karauli	Badh Kamla	76.9250	26.6930	3500
666	Rajasthan	Karauli	Karauli	77.0172	26.5014	4170
667	Rajasthan	Karauli	Islampur	77.0170	26.7000	4800
668	Rajasthan	Karauli	Karsai	76.9330	26.4250	6500
669	Rajasthan	Karauli	Sahar1	76.7110	26.6080	9900
670	Rajasthan	Nagaur	Sanward	74.5170	27.5170	3240
671	Rajasthan	Nagaur	Datau	74.4567	27.4906	3620
672	Rajasthan	Nagaur	Singhana	74.5125	27.4753	3710
673	Rajasthan	Nagaur	Jayal Block Hq	74.1863	27.2186	4210
674	Rajasthan	Nagaur	Chosli	74.2550	26.9300	5200
675	Rajasthan	Nagaur	Bagot	74.5911	26.8131	5410
676	Rajasthan	Nagaur	Kuchaman Block Hq	74.8591	27.1483	5410
677	Rajasthan	Nagaur	Raghunathpura	74.5170	27.3750	5500
678	Rajasthan	Nagaur	Ladnu Block Hq	74.3908	27.6296	6200
679	Rajasthan	Nagaur	Nawa	75.0021	27.0329	6710
680	Rajasthan	Nagaur	Nagaur	73.7500	27.1833	7500
681	Rajasthan	Nagaur	Dagawas Block Hq	74.0580	26.6458	8700
682	Rajasthan	Nagaur	Kheevsar Block Hq	73.4140	26.9647	8980
683	Rajasthan	Nagaur	Degana	74.3547	26.8181	9240
684	Rajasthan	Pali	Kariasoda	73.6380	25.8330	3060
685	Rajasthan	Pali	Kirwa	73.2580	25.4960	3520
686	Rajasthan	Pali	Rani	73.3158	25.3425	4580
687	Rajasthan	Pali	Sojat Block Hq	73.6698	25.9283	5490
688	Rajasthan	Pali	Prathvipura	73.8167	26.2000	5950
689	Rajasthan	Pali	Vaed	72.9670	25.7240	7920
690	Rajasthan	Pali	Gundoj	73.3130	25.6080	8930
691	Rajasthan	Rajsamand	Ghata	74.1830	25.7830	3060
692	Rajasthan	Rajsamand	Nadiawala	73.8630	25.2030	3120
693	Rajasthan	Rajsamand	Bhim	74.0792	25.7433	3180
694	Rajasthan	Rajsamand	Gugli	73.8800	25.2300	3430
695	Rajasthan	Rajsamand	Gavardi	74.1000	24.9040	3820
696	Rajasthan	Sawai Madhopur	Gangapur2	76.7330	26.4830	3200
697	Rajasthan	Sawai Madhopur	Tond	76.3970	26.3670	3570
698	Rajasthan	Sawai Madhopur	Tonk	76.2542	26.3542	3570
699	Rajasthan	Sawai Madhopur	Bamnawas	76.5610	26.5500	5240
700	Rajasthan	Sikar	Ramgarh	75.1822	27.2572	3150
701	Rajasthan	Sikar	Patan	75.9830	27.8000	7320
702	Rajasthan	Sirohi	Barlot	72.7170	24.9950	3080
703	Rajasthan	Sirohi	Kalandari	72.6875	24.9250	3210
704	Rajasthan	Sirohi	Sheoganj	73.0451	25.1450	6300
705	Rajasthan	Tonk	Mehndwas	75.7250	26.1110	3760
706	Rajasthan	Tonk	Bantholi	75.5670	25.8830	4290
707	Rajasthan	Udaipur	Bhoyana	73.9170	24.7170	4450

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
708	Rajasthan	Udaipur	Dingri	73.8670	24.2170	4650
709	Rajasthan	Udaipur	Mavli1	73.9830	24.7830	5010
710	Tamil Nadu	Chennai	Tirumangalam	80.1875	13.0833	5740
711	Tamil Nadu	Chennai	Adayar	80.2627	13.0089	19600
712	Tamil Nadu	Coimbatore	Kallampalayam Pz	77.2833	11.0300	3070
713	Tamil Nadu	Coimbatore	Chinnaripalayam	77.0917	10.7292	3100
714	Tamil Nadu	Coimbatore	Ganganaickenpalayam Pz	77.4356	11.1092	4640
715	Tamil Nadu	Coimbatore	Kunnakalpalayam Pz	77.3272	11.0456	7430
716	Tamil Nadu	Dharmapuri	Sillarahalli	78.2806	12.0525	3100
717	Tamil Nadu	Dharmapuri	Sillarahalli	78.2806	12.0525	3100
718	Tamil Nadu	Dharmapuri	Indoor	78.0583	12.1333	3300
719	Tamil Nadu	Dharmapuri	Indoor	78.0583	12.1333	3300
720	Tamil Nadu	Dindigul	Nattam	78.2333	10.2328	3010
721	Tamil Nadu	Dindigul	Kanakkanpatti	77.5667	10.4750	3460
722	Tamil Nadu	Dindigul	Vedasandur New	77.9711	10.5475	3490
723	Tamil Nadu	Dindigul	Thamaraipadi	78.0453	10.4053	4020
724	Tamil Nadu	Dindigul	Paraipatti	77.9750	10.3583	4220
725	Tamil Nadu	Dindigul	Natham1	78.2472	10.2222	4660
726	Tamil Nadu	Dindigul	P.Alagapuri	77.9756	10.5983	4990
727	Tamil Nadu	Dindigul	Siddayamkottai	77.8356	10.2725	5830
728	Tamil Nadu	Erode	Nambiyur	77.3208	11.3606	3390
729	Tamil Nadu	Erode	Ooricheri	77.6058	11.4650	3530
730	Tamil Nadu	Erode	Pudupalayam1	77.5875	11.5944	3840
731	Tamil Nadu	Erode	Molengkuttipalayam	77.7022	11.0672	3970
732	Tamil Nadu	Erode	Vijayamangalam Pz	77.5028	11.2444	4044
733	Tamil Nadu	Erode	Murliapur	77.6560	11.6781	4270
734	Tamil Nadu	Erode	Pattaidurai	77.7394	10.7011	4500
735	Tamil Nadu	Erode	Vellakoil	77.7153	10.9444	4600
736	Tamil Nadu	Erode	Pudupai Pz	77.7225	10.9586	5790
737	Tamil Nadu	Erode	Ingur New	77.5814	11.2258	5860
738	Tamil Nadu	Erode	Muttur1	77.7333	11.0417	6400
739	Tamil Nadu	Erode	Erakalpudur(Sivanmalai)	77.5347	11.0308	7000
740	Tamil Nadu	Erode	Karaiyur1	77.5944	10.7639	8560
741	Tamil Nadu	Erode	Kavilipalayam	77.2308	11.3802	10700
742	Tamil Nadu	Kancheepuram	Uthiramerur2	79.7375	12.6083	6080
743	Tamil Nadu	Karur	Thogamalai	78.4250	10.7292	3160
744	Tamil Nadu	Karur	Kovilur	77.8289	10.7603	4040
745	Tamil Nadu	Karur	Vellianani	78.1333	10.8667	4080
746	Tamil Nadu	Karur	Ayyampalayam Pz	78.0361	11.0625	4660
747	Tamil Nadu	Karur	Enuguru Dw	78.4878	10.8547	9070
748	Tamil Nadu	Krishnagiri	Pannandur	78.2794	12.3013	3270
749	Tamil Nadu	Krishnagiri	Panneswara Madam	78.2469	12.3917	3630
750	Tamil Nadu	Krishnagiri	Panneswara Madam	78.2469	12.3917	3630
751	Tamil Nadu	Krishnagiri	Mattur	78.4139	12.3833	3860
752	Tamil Nadu	Krishnagiri	Mattur	78.4139	12.3833	3860
753	Tamil Nadu	Madurai	Kolluveeranpatti Pz	77.5308	9.4225	3210
754	Tamil Nadu	Madurai	Valayankulam	78.0917	9.8042	3690
755	Tamil Nadu	Madurai	Thirumangalam New	77.9792	9.8167	3890
756	Tamil Nadu	Madurai	Keelakottai Pz	78.0019	9.7867	4200
757	Tamil Nadu	Madurai	Tirumangalam Pz	77.8833	9.9208	4430
758	Tamil Nadu	Madurai	Thirupallai	78.1453	9.9805	4470
759	Tamil Nadu	Nagapattinam	Valagarai	79.7483	10.6289	3760
760	Tamil Nadu	Namakkal	Velur	78.0033	11.1083	3200
761	Tamil Nadu	Namakkal	Gurusamipalayam	78.1344	11.4342	3250
762	Tamil Nadu	Namakkal	Senthamangalam	78.2333	11.3028	3340

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
763	Tamil Nadu	Namakkal	Pottireddipatti	78.2744	11.1689	3650
764	Tamil Nadu	Namakkal	Paramarhi Dw	78.0214	11.1567	3790
765	Tamil Nadu	Namakkal	Pudur Siddhampoondi	77.9142	11.2361	4013
766	Tamil Nadu	Namakkal	Thoppur (N)	78.1517	11.1011	4180
767	Tamil Nadu	Namakkal	Ramapuram	78.0092	11.4403	4730
768	Tamil Nadu	Namakkal	Ezhur-Olapalayam D	78.1192	11.3658	5430
769	Tamil Nadu	Perambalur	Chitali	78.9682	11.2406	3590
770	Tamil Nadu	Perambalur	Kunnam	78.9491	11.3477	3830
771	Tamil Nadu	Perambalur	Therku Mathevi (Aathukeni)	79.2375	11.1400	3890
772	Tamil Nadu	Perambalur	Veppur(Nallur)	79.0636	11.3167	4130
773	Tamil Nadu	Perambalur	Padalur	78.8252	11.0960	6330
774	Tamil Nadu	Perambalur	Vijayagopalapuram	79.0314	11.2700	6830
775	Tamil Nadu	Pudukkottai	Thirumayam Dw	78.7455	10.2427	3020
776	Tamil Nadu	Pudukkottai	Viralimalai Dw	78.5499	10.6083	3110
777	Tamil Nadu	Pudukkottai	Lekkampatti Pz	78.7264	10.5597	3540
778	Tamil Nadu	Pudukkottai	Peraiyur Dw	78.4467	9.3569	3580
779	Tamil Nadu	Pudukkottai	Deviupattinam Dw	78.8976	9.4808	5690
780	Tamil Nadu	Pudukkottai	Mandangudi Dw	78.9283	10.4853	4320
781	Tamil Nadu	Pudukkottai	Sundarapatti Pz	78.7069	10.3588	5270
782	Tamil Nadu	Ramanathapuram	Kizhakakarai	78.7840	9.2394	6450
783	Tamil Nadu	Ramanathapuram	Bogalur Dw	78.7078	9.4024	15430
784	Tamil Nadu	Ramanathapuram	Mimisal Dw	79.1476	9.9283	16210
785	Tamil Nadu	Ramanathapuram	U Kosamangai Dw	78.7343	9.3152	6930
786	Tamil Nadu	Salem	Mamudi	78.0517	11.5325	3110
787	Tamil Nadu	Salem	Tivettipatti	78.0875	11.8667	3270
788	Tamil Nadu	Salem	Salem Surviellance	78.1664	11.6594	3350
789	Tamil Nadu	Salem	Puthur Dw	78.7833	11.6264	3370
790	Tamil Nadu	Salem	Omalur	78.7458	11.7458	3390
791	Tamil Nadu	Salem	Naikarapatty Dw	78.1061	11.6219	3520
792	Tamil Nadu	Salem	Sivadapuram Dw	78.1092	11.6472	3960
793	Tamil Nadu	Salem	Palampatti	78.0722	11.5694	4450
794	Tamil Nadu	Salem	Karumbapatti	77.8611	11.5822	4930
795	Tamil Nadu	Salem	Veerapandi Dw	78.0728	11.5736	5400
796	Tamil Nadu	Salem	Akkaripalayam	78.0500	11.3406	5760
797	Tamil Nadu	Salem	Attayampatti S.Puram	78.0750	11.5253	6370
798	Tamil Nadu	Salem	Pulaveri	78.1083	11.6083	7830
799	Tamil Nadu	Salem	Sevantampatti	78.0917	11.5583	8870
800	Tamil Nadu	Sivaganga	Rameswaram Dw	79.3204	9.2884	4690
801	Tamil Nadu	Sivaganga	Tiruvengamputhur Dw	78.7858	9.8304	5700
802	Tamil Nadu	Sivaganga	Kalayarkoil Dw	78.6344	9.8467	3080
803	Tamil Nadu	Sivaganga	Manamadurai Pz	78.4597	9.7010	3520
804	Tamil Nadu	Theni	Koduvilarpatti Pz	77.4919	9.9719	3790
805	Tamil Nadu	Theni	Periyakulam	77.5500	10.1208	3890
806	Tamil Nadu	Theni	Sankarapuram Pz	77.3297	9.9069	4040
807	Tamil Nadu	Thiruvannamalai	Chengam2	78.7917	12.2917	3900
808	Tamil Nadu	Tirunelveli	Kadayanallur	77.3458	9.0667	3060
809	Tamil Nadu	Tirunelveli	Therkuvalliyur Ow	77.6240	8.3331	3090
810	Tamil Nadu	Tirunelveli	Kadayanallur1	77.3500	9.0833	3120
811	Tamil Nadu	Tirunelveli	Tenkasi Ow	77.3115	8.9633	3120
812	Tamil Nadu	Tirunelveli	Poothatan Kudieruppu Dw	77.5603	8.5783	3260
813	Tamil Nadu	Tirunelveli	P.Chatram	77.6125	9.1183	3270
814	Tamil Nadu	Tirunelveli	Udayattur A/B Ow	77.7206	8.2325	3510
815	Tamil Nadu	Tirunelveli	Rajapathi Ow	77.7696	8.8517	3850
816	Tamil Nadu	Tirunelveli	Seetharappanallur	77.6018	8.7939	4560
817	Tamil Nadu	Tirunelveli	Chettikulam	77.6167	8.1667	4790

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
818	Tamil Nadu	Tirunelveli	Kuttam	77.9366	8.3211	5790
819	Tamil Nadu	Tirunelveli	N. Vijayanarayanam	77.7917	8.5333	6450
820	Tamil Nadu	Tiruppur	Karavallurpz	77.1692	11.2894	3620
821	Tamil Nadu	Tiruppur	Kasipalayam (T)	77.3858	11.1156	4350
822	Tamil Nadu	Tiruppur	Tiruppur Agraharam	77.4133	11.1253	4840
823	Tamil Nadu	Tiruppur	Arugampalayam	77.4644	11.1247	10580
824	Tamil Nadu	Tiruvallur	Kanakammachatrm	79.7500	13.2083	3130
825	Tamil Nadu	Tiruvallur	Tirupalavanam	80.2485	13.4020	3250
826	Tamil Nadu	Tiruvallur	Mettukandigai	79.9667	13.0667	3360
827	Tamil Nadu	Tiruvallur	Sangaibedu	80.2977	13.3298	3390
828	Tamil Nadu	Tiruvallur	Chozambedu (Tirumullaivayal)	80.1364	13.1203	6300
829	Tamil Nadu	Tiruvarur	Pangal	79.6417	10.7208	4140
830	Tamil Nadu	Trichy	Pulivalam	78.6375	11.0167	3350
831	Tamil Nadu	Trichy	Kovilpatty	78.3000	10.5500	3430
832	Tamil Nadu	Trichy	Peramangalam	78.6542	10.9867	3550
833	Tamil Nadu	Trichy	Pullambadi1	78.9125	10.9417	4740
834	Tamil Nadu	Trichy	Mudaliarchatram	78.6967	10.8003	7750
835	Tamil Nadu	Tuticorin	Tiruchendur-E	78.1222	8.4944	3290
836	Tamil Nadu	Tuticorin	Nagalapuram	78.1306	9.2333	3320
837	Tamil Nadu	Tuticorin	Petmanagar	77.9500	8.6500	3410
838	Tamil Nadu	Tuticorin	Paikulam	77.8556	8.5181	3430
839	Tamil Nadu	Tuticorin	Eppodumvendram	78.0458	9.0292	4570
840	Tamil Nadu	Tuticorin	Villiseri	77.8500	9.0583	5040
841	Tamil Nadu	Tuticorin	Kurukkuchalai	78.0917	8.9306	5920
842	Tamil Nadu	Tuticorin	Tuticorin1	78.1389	8.8083	7730
843	Tamil Nadu	Vellore	Kandili	78.4556	12.4778	3670
844	Tamil Nadu	Villipuram	Rajampalayam	79.1378	11.9459	3059
845	Tamil Nadu	Villipuram	Chinnasalem	78.8818	11.6375	3200
846	Tamil Nadu	Villipuram	Gingee	79.4259	12.2521	4410
847	Tamil Nadu	Villipuram	Kiliyanur	79.7458	12.1008	5045
848	Tamil Nadu	Virudhunagar	Virudunagar	77.9542	9.5833	3610
849	Tamil Nadu	Virudhunagar	Aviyur Dw	78.1008	9.7389	3680
850	Tamil Nadu	Virudhunagar	Sevalpatti	77.9583	9.5583	3750
851	Tamil Nadu	Virudhunagar	Alangulam	77.6861	9.3639	4180
852	Tamil Nadu	Virudhunagar	Mudukkankulam	78.2058	9.1508	4270
853	Tamil Nadu	Virudhunagar	Srivilliputhur1	77.6333	9.5000	4360
854	Tamil Nadu	Virudhunagar	Choolapuram	77.5583	9.3833	4520
855	Tamil Nadu	Virudhunagar	Vembakkottai-Ow	77.7667	9.3333	4670
856	Tamil Nadu	Virudhunagar	Kalloorani	78.1650	9.4639	5090
857	Tamil Nadu	Virudhunagar	Palavanatham	78.0750	9.5667	5430
858	Tamil Nadu	Virudhunagar	Nenmeni1	78.0083	9.3250	19850
859	Telangana	Khammam	Chirevalli	81.0867	17.5939	3007
860	Telangana	Khammam	Annarugudem	80.4261	17.2603	3890
861	Telangana	Khammam	Yerupalem	80.4722	16.8333	4110
862	Telangana	Khammam	Rebbavaram	80.3369	17.1167	4946
863	Telangana	Khammam	Sitarampuram	80.6431	17.2008	5400
864	Telangana	Mahabubnagar	Veepangandla	78.1379	16.1146	3000
865	Telangana	Mahabubnagar	Kothur-Pz	78.2742	17.1358	3070
866	Telangana	Mahabubnagar	Alampur X Crossroad-Aq-I	78.0183	15.9147	3080
867	Telangana	Mahabubnagar	Janumpalle	78.2794	16.3005	3100
868	Telangana	Mahabubnagar	Gundimal	77.7103	16.8958	3150
869	Telangana	Mahabubnagar	Kothapalle	77.7996	16.2800	3260
870	Telangana	Mahabubnagar	Thaduru- Aq-I	78.3597	16.5158	3430
871	Telangana	Mahabubnagar	Jupally- Aq-I	78.6031	16.6592	5780

S.No.	State	District	Location	Long	Lat	EC > 3000 $\mu\text{S}/\text{cm}$
872	Telangana	Mahabubnagar	Boravalle	77.9760	16.0254	16500
873	Telangana	Medak	Kohir	77.7172	17.6100	5100
874	Telangana	Medak	Nizampet	77.8839	18.0953	6640
875	Telangana	Medak	Pz Of Aq-I, At-Digwal	77.7133	17.6628	7684
876	Telangana	Nalgonda	Mangapur	79.5389	17.0097	3040
877	Telangana	Nalgonda	Munagala	79.8336	17.0528	3206
878	Telangana	Nalgonda	Wankamamidi Aq-I	78.8825	17.3561	3290
879	Telangana	Nalgonda	Balwemla	79.5944	17.2097	3480
880	Telangana	Nalgonda	Nagaram- Aq-I	79.0200	17.3569	3500
881	Telangana	Nalgonda	Wankamamidi Aq-Ii	78.8825	17.3561	3560
882	Telangana	Nalgonda	Nidamanuru- Pz	79.3750	16.8306	3630
883	Telangana	Nalgonda	Nagaram-Aq-Ii	79.0200	17.3569	3840
884	Telangana	Nalgonda	Antampet-Pz-I	78.8889	17.0361	4150
885	Telangana	Nalgonda	Antampet-Pz-Ii	78.8889	17.0361	4320
886	Telangana	Nalgonda	Munugodu-Pz	79.0837	17.0773	4320
887	Telangana	Nalgonda	Nagaram	79.0339	17.3575	5590
888	Telangana	Nizamabad	Khazipur	77.7944	18.6787	3035
889	Telangana	Nizamabad	Bairangaidi	77.7843	18.4985	3550
890	Telangana	Warangal	Dammannapet	79.5250	17.7516	3310
891	Uttar Pradesh	Agra	Saiyan	77.93848	26.94496	3250
892	Uttar Pradesh	Agra	Achhnera	77.75565	27.17659	4419
893	Uttar Pradesh	Agra	Etmadpur	78.18947	27.23328	4512
894	Uttar Pradesh	Agra	Jagner	77.60434	26.86455	5223
895	Uttar Pradesh	Agra	Kheragarh	77.82308	26.95628	6636
896	Uttar Pradesh	Agra	Akola	77.88605	27.07119	11370
897	Uttar Pradesh	Agra	Fatehpur Sikari	77.65428	27.08437	12300
898	Uttar Pradesh	Aligarh	Khair	77.83641	27.94351	3146
899	Uttar Pradesh	Aligarh	Gonda	77.87962	27.83668	3882
900	Uttar Pradesh	Etah	Jalesar	78.30801	27.47949	3367
901	Uttar Pradesh	Fatehpur	Malwan	80.73715	26.07108	3179
902	Uttar Pradesh	Firozabad	Firozabad	78.38092	27.16680	3838
903	Uttar Pradesh	G.B.Nagar	Bisrakh	77.37709	28.58839	3398
904	Uttar Pradesh	Gautam Buddha Nagar	Zewar	77.60769	28.13596	3302
905	Uttar Pradesh	Gautam Buddha Nagar	Zewar	77.53917	28.10812	5035
906	Uttar Pradesh	Hamirpur	Maudaha	80.09440	25.68711	3092
907	Uttar Pradesh	Hamirpur	Rath	79.57604	25.59904	3279
908	Uttar Pradesh	Hamirpur	Sarila	79.67901	25.77548	4393
909	Uttar Pradesh	Hathras	Mursan	77.94111	27.56838	4254
910	Uttar Pradesh	Hathras	Sadabad	78.04008	27.44663	5218
911	Uttar Pradesh	Mahamaya Nagar	Aharai	77.95120	27.52751	8250
912	Uttar Pradesh	Mathura	Lohaban	77.72932	27.50069	3370
913	Uttar Pradesh	Mathura	Bathain Kalan	77.40773	27.75652	3610
914	Uttar Pradesh	Mathura	Ajnokh	77.41045	27.67341	3688
915	Uttar Pradesh	Mathura	Gaiyara	77.79860	27.58960	4173
916	Uttar Pradesh	Mathura	Mat	77.71605	27.63071	4345
917	Uttar Pradesh	Mathura	Nagla Karan	77.83151	27.52781	4404
918	Uttar Pradesh	Mathura	Goverdhan	77.47056	27.48276	4463
919	Uttar Pradesh	Mathura	Chaumuhan	77.57925	27.62082	4536
920	Uttar Pradesh	Mathura	Raya	77.78480	27.54948	4937
921	Uttar Pradesh	Mathura	Ajijpur	77.46436	27.75798	5198
922	Uttar Pradesh	Mathura	Bhagosa	77.45926	27.52486	6623
923	Uttar Pradesh	Mathura	Farah	77.74939	27.31028	7608
924	Uttar Pradesh	Mathura	Nohjhil	77.64946	27.84581	9756

S.No.	State	District	Location	Long	Lat	EC > 3000 μS/cm
925	Uttar Pradesh	Mathura	Borpa	77.50702	27.44573	16740
926	Uttar Pradesh	Mathura	Baroli	77.56217	27.68057	23920
927	Uttar Pradesh	Unnao	Asoha	80.82993	26.58764	4255
928	Uttarakhand	Dehradun	Maldevta	78.1203	30.3439	3094
929	Uttarakhand	Dehradun	Maldevta	78.1203	30.3439	3094
930	West Bengal	Howrah	Shibpur (Gadiara)	88.0300	22.2258	3084
931	West Bengal	Howrah	Burikhali	88.1611	22.5069	3275
932	West Bengal	Howrah	Panchla	88.0631	22.5344	3722
933	West Bengal	Howrah	Baganda	88.0853	22.3894	3902
934	West Bengal	Howrah	Ramrajatola	88.2975	22.5892	4193
935	West Bengal	Purulia	Dadki	86.6771	23.1779	3265
936	West Bengal	Purulia	Anara	86.5647	23.4913	3510
937	West Bengal	South 24 Parganas	Hatuganj	88.2538	22.1689	5831

Annexure II**Locations having Chloride > 1000 mg/l in Ground Water in Different States/UT of India**

S. No.	State	District	Location	Longitude	Latitude	Cl > 1000 mg/L
1	Andhra Pradesh	Anantpur	Igudur	77.9400	14.9700	2411
2	Andhra Pradesh	Chittur	Basani Khonda	78.5294	13.5519	1800
3	Andhra Pradesh	East Godavari	Kasinadhapuram	82.2306	16.9250	1082
4	Andhra Pradesh	East Godavari	Hamsavaram	82.4937	17.2923	1087
5	Andhra Pradesh	East Godavari	Gollaprolu	82.2865	17.1539	1230
6	Andhra Pradesh	East Godavari	Fishing Horbour	82.2758	16.9851	1446
7	Andhra Pradesh	Guntur	Santagudipadu	79.9141	16.2534	1002
8	Andhra Pradesh	Guntur	Mandhadam	80.5316	16.5145	1019
9	Andhra Pradesh	Guntur	Guntur	80.4317	16.2985	1541
10	Andhra Pradesh	Guntur	Kolluru	80.8171	16.1308	1721
11	Andhra Pradesh	Guntur	Prattipadu	80.3318	16.1803	2162
12	Andhra Pradesh	Kadapa	Prabhalaveedu	79.0108	14.7951	1024
13	Andhra Pradesh	Kadapa	Konnidigaripalli	78.9553	13.9856	2369
14	Andhra Pradesh	Krishna	Kurumaddali	80.9261	16.3311	1095
15	Andhra Pradesh	Krishna	Jagannathapuram	80.4099	16.7294	1110
16	Andhra Pradesh	Krishna	Palevada	81.2870	16.5795	2084
17	Andhra Pradesh	Krishna	Mandavalli	81.1637	16.5177	2602
18	Andhra Pradesh	Krishna	Kaikaluru1	81.2000	16.5449	2903
19	Andhra Pradesh	Kurnool	Naganathanahalli	77.2333	15.5667	1099
20	Andhra Pradesh	Kurnool	Tungabhadra	79.3083	15.9372	1170
21	Andhra Pradesh	Kurnool	Bapuram1	77.1489	15.3486	1741
22	Andhra Pradesh	Kurnool	Veldurti	77.9249	15.5463	2942
23	Andhra Pradesh	Nellore	Tikkavaram	79.8617	14.1278	1028
24	Andhra Pradesh	Nellore	Krishnapuram	79.9689	13.7811	1808
25	Andhra Pradesh	Prakasham	Donakonda	79.4847	15.8331	1035
26	Andhra Pradesh	Prakasham	Guttalaumadivrm	79.5581	16.0164	1808
27	Andhra Pradesh	Prakasham	Pedda Alavalapadu	79.6267	15.3272	3722
28	Andhra Pradesh	Srikakulam	Heeramandalam	83.9667	18.6667	1170
29	Andhra Pradesh	West Godavari	Pentapadu	81.5264	16.7859	1386
30	Andhra Pradesh	West Godavari	Narsimhapuram	81.5019	16.5583	3002
31	Delhi	Delhi	Khera Kalan Pz	77.1181	28.7694	2836
32	Dnh	Diu	Zolawadi	70.9306	20.7242	4580
33	Gujarat	Ahmedabad	Viramgam2	72.0384	23.1367	1560
34	Gujarat	Ahmedabad	Kumarkhan	72.0207	22.9006	3013
35	Gujarat	Amreli	Mandal	71.5793	21.0994	1136
36	Gujarat	Amreli	Bherai	71.4868	20.9740	1285
37	Gujarat	Amreli	Devaliya	71.2505	21.5277	1370
38	Gujarat	Anand	Kansari1	72.6516	22.3413	1141
39	Gujarat	Banaskantha	Gangodra	72.3647	24.4397	1044
40	Gujarat	Banaskantha	Dudhva	71.6690	24.4794	1583
41	Gujarat	Bharuch	Navetha	72.8281	21.7091	1042
42	Gujarat	Bharuch	Jambusar2	72.8086	22.0494	1049
43	Gujarat	Bharuch	Sahol	72.8184	21.4446	1049
44	Gujarat	Bharuch	Tankari	72.6691	21.9882	1418
45	Gujarat	Bhavnagar	Mahuva	71.7470	21.1000	1058
46	Gujarat	Bhavnagar	Ukharala	71.8867	21.7700	2812
47	Gujarat	Chhota Udepur	Govindpura	73.7400	22.2155	1347
48	Gujarat	Devbhoomi Dwarka	Kalyanpur	69.0542	22.3076	1136
49	Gujarat	Devbhoomi Dwarka	Khakharda	69.3721	22.1048	1392
50	Gujarat	Devbhoomi Dwarka	Gojines	69.2036	22.0238	1491

S. No.	State	District	Location	Longitude	Latitude	Cl > 1000 mg/L
51	Gujarat	Devbhumi Dwarka	Mojap	68.9796	22.3615	1207
52	Gujarat	Devbhumi Dwarka	Samrasar1	69.1063	22.3699	1328
53	Gujarat	Devbhumi Dwarka	Hanzdapur	69.4368	22.1889	1413
54	Gujarat	Devbhumi Dwarka	Varwada	68.9615	22.2977	4260
55	Gujarat	Jamnagar	Jambuda	70.2064	22.5215	1157
56	Gujarat	Jamnagar	Kesiya	70.3971	22.6966	1250
57	Gujarat	Jamnagar	Bedanpur	70.3125	22.6875	3067
58	Gujarat	Jamnagar	Hadiyana	70.2659	22.6118	4480
59	Gujarat	Junagadh	Kanek	70.2439	21.0360	1212
60	Gujarat	Junagadh	Shardagram	70.1431	21.1038	1595
61	Gujarat	Junagadh	Arena	70.1771	21.0808	1879
62	Gujarat	Junagadh	Khorada1	70.1876	21.0722	1943
63	Gujarat	Junagadh	Osa	70.0642	21.3729	4027
64	Gujarat	Kachchh	Ratanpur Khadir	70.3631	23.8608	1064
65	Gujarat	Kachchh	Vadala	69.8556	22.9161	1205
66	Gujarat	Kachchh	Samkhiari	70.5083	23.3000	1290
67	Gujarat	Kachchh	Mothala	69.1250	23.2083	1489
68	Gujarat	Kachchh	Sukhpar	69.6167	23.2083	1595
69	Gujarat	Kachchh	Khavda	69.7306	23.8389	1631
70	Gujarat	Kachchh	Shinaya	70.0542	23.0333	1702
71	Gujarat	Kachchh	Kharai_1	68.6856	23.4631	1843
72	Gujarat	Kachchh	Bambhdai	69.0828	22.9389	2092
73	Gujarat	Kachchh	Devisar	69.3292	23.4028	2092
74	Gujarat	Kheda	Ladvel	73.1262	22.9086	1021
75	Gujarat	Kheda	Muliyad	73.1497	22.7908	2162
76	Gujarat	Morbi	Halvad2	71.1854	23.0196	1150
77	Gujarat	Morbi	Modpar1	70.6625	22.9017	1321
78	Gujarat	Morbi	Amar Nagar	70.8244	22.9348	2229
79	Gujarat	Patan	Gochanad	71.6244	23.7708	2730
80	Gujarat	Patan	Moti Chander	71.7806	23.5944	8933
81	Gujarat	Porbandar	Kuchhadi	69.5489	21.6810	1099
82	Gujarat	Porbandar	Kutiyaana1	70.0113	21.6284	1560
83	Gujarat	Porbandar	Mojiwana	69.5743	21.8600	1893
84	Gujarat	Porbandar	Oddar	69.6921	21.5529	1985
85	Gujarat	Porbandar	Babda	69.5903	21.7406	2276
86	Gujarat	Rajkot	Ganod	70.1693	21.6888	1186
87	Gujarat	Rajkot	Movaiya	70.6275	22.4579	2031
88	Gujarat	Sabarkantha	Silwad	73.1241	24.0128	1377
89	Gujarat	Surendranagar	Kherwa	71.7438	23.0006	1058
90	Gujarat	Surendranagar	Dhajala	71.3978	22.3806	1122
91	Gujarat	Surendranagar	Nava Sudamda	71.4358	22.5397	1221
92	Gujarat	Surendranagar	Muli	71.4644	22.6390	1427
93	Gujarat	Surendranagar	Moti Moladi	71.1040	22.4179	1555
94	Gujarat	Surendranagar	Rajsitapur	71.5967	22.8380	1988
95	Gujarat	Surendranagar	Gangad	71.9728	22.9489	2521
96	Gujarat	Surendranagar	Kharaghoda	71.7522	23.1877	8520
97	Gujarat	Valsad	Magod	72.9049	20.5659	1446
98	Haryana	Bhiwani	Tigrana	76.1500	28.8420	1008
99	Haryana	Bhiwani	Bamla	76.2450	28.8070	1250
100	Haryana	Faridabad	Ballabgarh	77.3350	28.3470	1049
101	Haryana	Faridabad	Cgwb Chq, Nh-Iv	77.3140	28.4180	1177
102	Haryana	Faridabad	Sikri	77.2879	28.2755	1858
103	Haryana	Faridabad	Pali	77.2440	28.3810	2694
104	Haryana	Faridabad	Ferozpur Kalan	77.2380	28.3030	3346
105	Haryana	Gurugram	Jhanjrola	77.0040	28.4830	1127
106	Haryana	Gurugram	Mauzabad	76.6900	28.2970	2769

S. No.	State	District	Location	Longitude	Latitude	Cl > 1000 mg/L
107	Haryana	Gurugram	Machana	76.7500	28.4080	3190
108	Haryana	Gurugram	Sewari	76.7230	28.4630	3230
109	Haryana	Hisar	Karnoh	75.7570	29.3730	1434
110	Haryana	Hisar	Kapro	76.1130	29.3790	1661
111	Haryana	Jhajjar	Subnah	76.5710	28.4820	1368
112	Haryana	Jhajjar	Dulhera	76.7880	28.6460	1432
113	Haryana	Jhajjar	Chuchakwas	76.5112	28.5980	2198
114	Haryana	Jhajjar	Chamanpura	76.6340	28.6910	3233
115	Haryana	Jind	Khatkaran	76.2450	29.4030	1248
116	Haryana	Jind	Baroda	76.2184	29.4311	1404
117	Haryana	Mahendragarh	Narnaul(Hot Spot)	76.1066	28.0501	1157
118	Haryana	Mahendragarh	Khatodra	76.0900	28.2820	1314
119	Haryana	Mewat	Indri	77.1003	28.1892	1234
120	Haryana	Mewat	Akaira	77.0040	28.0080	1478
121	Haryana	Mewat	Malab	77.0110	28.0420	1564
122	Haryana	Mewat	Gulalta	77.1790	27.9170	1640
123	Haryana	Mewat	Kheri Kankar	77.0708	28.1874	1648
124	Haryana	Mewat	Nagina	76.9830	27.9170	1947
125	Haryana	Palwal	Hodal	77.3500	27.8830	1290
126	Haryana	Palwal	Tumsara	77.3420	28.0080	1659
127	Haryana	Palwal	Baghola	77.3080	28.2210	1787
128	Haryana	Palwal	Lakhnakha	77.1880	28.0350	2099
129	Haryana	Palwal	Hathin	77.2420	28.0460	2145
130	Haryana	Palwal	Kot	77.2290	27.9580	2637
131	Haryana	Rewari	Balawas	76.5290	28.1040	1108
132	Haryana	Rewari	Sangwari	76.6836	28.1637	1198
133	Haryana	Rewari	Chimnawas	76.4983	28.2143	2396
134	Haryana	Rohtak	Samargopalpur	76.5130	28.9640	1787
135	Haryana	Sirsa	Taruana	75.0080	29.8250	1392
136	Haryana	Sirsa	Shergarh	74.6760	29.9260	1839
137	Haryana	Sonipat	Bohela	76.8540	29.0800	1659
138	Karnataka	Bagalkot	Algur	76.1075	16.0653	1418
139	Karnataka	Bagalkot	Gorbal	75.5451	16.0108	1574
140	Karnataka	Bagalkot	Guledgudda	75.5299	16.3760	2574
141	Karnataka	Belagavi	Rupnal	74.6449	16.5067	1347
142	Karnataka	Belagavi	Mole	74.9233	16.7189	1489
143	Karnataka	Bijapur	Sathihal(Santhal)	76.0572	16.7332	1047
144	Karnataka	Bijapur	Honaganahalli	75.7337	16.6815	1167
145	Karnataka	Bijapur	Sawalsanga	75.7431	17.1135	1396
146	Karnataka	Bijapur	Khatijapur	75.6760	16.7651	2482
147	Karnataka	Raichur	Hirekotankal	76.9500	15.9600	1276
148	Karnataka	Yadgir	Khembhavi	76.5326	16.6483	1489
149	Maharashtra	Ahmednagar	Ghotan	75.3000	19.4000	1202
150	Maharashtra	Ahmednagar	Chikhale	74.7167	18.8667	1219
151	Maharashtra	Akola	Akola	77.0017	20.7367	1524
152	Maharashtra	Amravati	Yevda	77.4586	20.9947	1560
153	Maharashtra	Aurangabad	Tunki	74.8500	20.1333	1702
154	Maharashtra	Beed	Manur	75.3167	19.0667	1822
155	Maharashtra	Chandrapur	Aksapur	79.6333	19.7583	1251
156	Maharashtra	Jalna	Jafrabad	76.0167	20.2000	1003
157	Maharashtra	Parbhani	Panchegaon-1	76.7094	19.5558	2265
158	Maharashtra	Solapur	Madha	75.5164	18.0383	1219
159	Punjab	Fazilka	Abohar	74.1901	30.1480	1293
160	Punjab	Muktsar	Sheranwali	74.4644	30.0318	1064
161	Punjab	Muktsar	Dohak	74.6009	30.6324	1273
162	Rajasthan	Alwar	Ramgarh1	76.8140	27.5940	1574

S. No.	State	District	Location	Longitude	Latitude	Cl > 1000 mg/L
163	Rajasthan	Alwar	Kathumar	77.0778	27.3161	1617
164	Rajasthan	Alwar	Lachmangarh	76.8600	27.3500	2056
165	Rajasthan	Banswara	Maudi Maska	74.3100	23.1500	1312
166	Rajasthan	Barmer	Kumarokidhani	72.1200	26.2000	1007
167	Rajasthan	Barmer	Gudamalani	71.6988	25.2140	1020
168	Rajasthan	Barmer	Sanawara	71.4000	25.4800	1056
169	Rajasthan	Barmer	Siyagatala	70.8653	25.3375	1149
170	Rajasthan	Barmer	Sawau Padam Singh	71.8067	26.1503	1227
171	Rajasthan	Barmer	Bisukalan	71.2780	26.2410	1247
172	Rajasthan	Barmer	Khara Mahecha	72.0265	25.5103	1316
173	Rajasthan	Barmer	Balotra	72.2404	25.8218	1524
174	Rajasthan	Barmer	Loonakalan	71.9829	25.4481	2056
175	Rajasthan	Barmer	Arniyali	71.9680	25.4670	2252
176	Rajasthan	Barmer	Thumbli	72.4886	26.2036	2375
177	Rajasthan	Barmer	Koloo	71.7130	26.0274	2964
178	Rajasthan	Barmer	Meghwalo Ki Basti	71.7731	26.0282	3020
179	Rajasthan	Barmer	Panchla	70.1670	25.9920	3261
180	Rajasthan	Barmer	Ramsar	70.8719	25.7303	3793
181	Rajasthan	Bharatpur	Gopalgargh	77.0633	27.6547	1375
182	Rajasthan	Bharatpur	Sewar	77.4403	27.1822	1418
183	Rajasthan	Bharatpur	Ludhawai_Gwd	77.3950	27.1750	1843
184	Rajasthan	Bharatpur	Kaman	77.2697	27.6572	1886
185	Rajasthan	Bharatpur	Deeg1	77.3330	27.4670	3829
186	Rajasthan	Bhilwara	Asind	74.3347	25.7328	1290
187	Rajasthan	Bhilwara	Gulabpura	74.6700	25.9000	2056
188	Rajasthan	Bikaner	Lakhasar2	73.8710	28.0960	1134
189	Rajasthan	Bikaner	Sattasar	73.1920	28.5920	1248
190	Rajasthan	Bikaner	Godu	72.2970	27.9920	1383
191	Rajasthan	Bikaner	Hariasar	73.8110	28.5760	1453
192	Rajasthan	Bikaner	Khara	73.3900	28.2000	2552
193	Rajasthan	Bikaner	Lakhusar	73.1920	28.3170	2552
194	Rajasthan	Bikaner	Khajuwala	72.5914	28.6931	3120
195	Rajasthan	Bikaner	Binjawari	73.4500	28.4670	5885
196	Rajasthan	Churu	Bamboo	74.1170	27.7330	1007
197	Rajasthan	Churu	Soniyasar	74.0208	27.7631	1007
198	Rajasthan	Churu	Bidasar	74.2830	27.8390	1205
199	Rajasthan	Churu	Binasar	74.8750	28.2630	1205
200	Rajasthan	Churu	Churu	74.9275	28.2955	1503
201	Rajasthan	Churu	Rampura	74.8630	28.4670	1659
202	Rajasthan	Churu	Ratangargh	74.6039	28.0561	1820
203	Rajasthan	Churu	Aspalsar	74.5044	28.5769	2021
204	Rajasthan	Churu	Parihara	74.5619	27.9244	2084
205	Rajasthan	Churu	Bhojasar	74.5420	27.9720	2155
206	Rajasthan	Churu	Sujangargh	74.4808	27.7069	2482
207	Rajasthan	Churu	Dudwa Khara	75.0790	28.4710	3155
208	Rajasthan	Churu	Tidiyasar	74.7540	28.0660	3191
209	Rajasthan	Churu	Sirsala	75.1310	28.4330	3403
210	Rajasthan	Churu	Dadrewa	75.2330	28.6690	3829
211	Rajasthan	Dausa	Lawan1	76.2170	26.7830	1099
212	Rajasthan	Dausa	Jasuta	76.3330	26.9670	1347
213	Rajasthan	Dausa	Bapi	76.2920	26.9750	1489
214	Rajasthan	Dausa	Mahuwa	76.9270	27.0490	1524
215	Rajasthan	Hanumangargh	Pallu	74.2000	28.9170	3013
216	Rajasthan	Hanumangargh	Dungrana	75.0970	29.0140	3864
217	Rajasthan	Jaipur	Madhorajpur	75.6560	26.5770	1035
218	Rajasthan	Jaipur	Choru	75.4500	26.5930	1078

S. No.	State	District	Location	Longitude	Latitude	Cl > 1000 mg/L
219	Rajasthan	Jaipur	Kanarpura	75.5720	27.1840	1170
220	Rajasthan	Jaipur	Mozmabad	75.3630	26.6830	1319
221	Rajasthan	Jaipur	Lasariya	75.5090	26.5570	1418
222	Rajasthan	Jaipur	Pallukhurd	75.3250	26.7360	1782
223	Rajasthan	Jaipur	Mangarwara	75.2780	26.6100	1843
224	Rajasthan	Jaipur	Majhi Renwal	75.6830	26.6960	1914
225	Rajasthan	Jaipur	Nasnota	75.4430	26.8000	2092
226	Rajasthan	Jaisalmer	Shekhowala	71.4230	27.3300	1078
227	Rajasthan	Jaisalmer	Sribhadria	71.5500	27.0830	1092
228	Rajasthan	Jaisalmer	Nathu Ka Bera	70.4150	27.8110	1134
229	Rajasthan	Jaisalmer	Rajgarh1	71.5450	26.5380	1205
230	Rajasthan	Jaisalmer	Kalewa	71.9040	26.8060	1595
231	Rajasthan	Jaisalmer	Tanot	70.3670	27.8000	1843
232	Rajasthan	Jaisalmer	Sadewala	70.2440	27.6350	3049
233	Rajasthan	Jaisalmer	Khariakua_Dw	70.3250	27.7170	3615
234	Rajasthan	Jalore	Nimla	72.8660	25.5310	1035
235	Rajasthan	Jalore	Halivav	71.5939	24.9911	1085
236	Rajasthan	Jalore	Bhagalbhim	72.2227	25.0188	1120
237	Rajasthan	Jalore	Khanpur	72.3538	25.0303	1149
238	Rajasthan	Jalore	Bhagli	72.5958	25.2786	1168
239	Rajasthan	Jalore	Sanchores	71.7946	24.7585	1333
240	Rajasthan	Jalore	Narta	72.2748	25.0883	2233
241	Rajasthan	Jhunjhunu	Birmi	75.1778	28.2000	1050
242	Rajasthan	Jodhpur	Bilara Block Hq	73.7106	26.1969	1078
243	Rajasthan	Jodhpur	Chabon Ki Dhani Block Hq	73.1671	26.6314	1106
244	Rajasthan	Jodhpur	Nokhracharna	72.8900	27.2300	1163
245	Rajasthan	Jodhpur	Samdari Block Hq	72.5756	26.8488	1241
246	Rajasthan	Jodhpur	Soyla	73.3375	26.8208	1276
247	Rajasthan	Jodhpur	Nahar Singh Nagar	72.2860	26.3900	1319
248	Rajasthan	Jodhpur	Dechupz	72.3277	26.7714	1341
249	Rajasthan	Jodhpur	Mogra	73.0330	26.1170	1347
250	Rajasthan	Jodhpur	Dhawa	72.7420	26.0580	1453
251	Rajasthan	Jodhpur	Sargiya Kallan	73.5400	26.5400	1461
252	Rajasthan	Jodhpur	Daarmi	73.6397	26.7339	1560
253	Rajasthan	Jodhpur	Borunda	73.7958	26.4692	1595
254	Rajasthan	Jodhpur	Bap	72.3462	27.3645	1985
255	Rajasthan	Jodhpur	Ramdawas	73.3658	26.3658	2056
256	Rajasthan	Jodhpur	Karani	72.8250	26.2720	2304
257	Rajasthan	Jodhpur	Bisalpur	73.3140	26.2330	2340
258	Rajasthan	Jodhpur	Benan	73.4210	26.3170	2765
259	Rajasthan	Jodhpur	Hemnagar	72.7817	26.2961	2836
260	Rajasthan	Jodhpur	Gangani	73.2120	26.5100	3049
261	Rajasthan	Jodhpur	Olvi	73.4580	26.2330	3758
262	Rajasthan	Jodhpur	Raron Ki Dhani	72.7750	26.1940	3900
263	Rajasthan	Jodhpur	Bhandu Kalan Uranium Hotspot	72.9015	26.1294	4538
264	Rajasthan	Jodhpur	Luni	73.0210	26.0000	4963
265	Rajasthan	Jodhpur	Binawas Uranium Hotspot	73.3782	26.2907	5672
266	Rajasthan	Jodhpur	Khatawas Uranium Hotspot	72.8027	26.1193	5956
267	Rajasthan	Jodhpur	Khudala	72.8320	26.1510	8508
268	Rajasthan	Jodhpur	Kukunda Uranium Hotspot	73.3223	26.3460	9359
269	Rajasthan	Karauli	Karsai	76.9330	26.4250	1418
270	Rajasthan	Karauli	Sahar1	76.7110	26.6080	1666
271	Rajasthan	Nagaur	Kuchaman Block Hq	74.8591	27.1483	1064
272	Rajasthan	Nagaur	Chosli	74.2550	26.9300	1134
273	Rajasthan	Nagaur	Bagot	74.5911	26.8131	1276

S. No.	State	District	Location	Longitude	Latitude	Cl > 1000 mg/L
274	Rajasthan	Nagaur	Nagaur	73.7500	27.1833	1347
275	Rajasthan	Nagaur	Raghunathpura	74.5170	27.3750	1383
276	Rajasthan	Nagaur	Ladnu Block Hq	74.3908	27.6296	1524
277	Rajasthan	Nagaur	Nawa	75.0021	27.0329	2021
278	Rajasthan	Nagaur	Dagawas Block Hq	74.0580	26.6458	2482
279	Rajasthan	Nagaur	Degana	74.3547	26.8181	2623
280	Rajasthan	Nagaur	Kheevsar Block Hq	73.4140	26.9647	2659
281	Rajasthan	Pali	Prathvipura	73.8167	26.2000	1383
282	Rajasthan	Pali	Sojat Block Hq	73.6698	25.9283	1843
283	Rajasthan	Pali	Vaed	72.9670	25.7240	1843
284	Rajasthan	Pali	Gundoj	73.3130	25.6080	2021
285	Rajasthan	Sawai Madhopur	Bamnawas	76.5610	26.5500	1049
286	Rajasthan	Sikar	Patan	75.9830	27.8000	1524
287	Rajasthan	Sirohi	Sheoganj	73.0451	25.1450	1645
288	Rajasthan	Udaipur	Mavli1	73.9830	24.7830	1156
289	Tamil Nadu	Chennai	Tirumangalam	80.1875	13.0833	1335
290	Tamil Nadu	Chennai	Adayar	80.2627	13.0089	6877
291	Tamil Nadu	Coimbatore	Kunnakalpalayam Pz	77.3272	11.0456	1406
292	Tamil Nadu	Dindigul	P.Alagapuri	77.9756	10.5983	1266
293	Tamil Nadu	Dindigul	Siddayamkottai	77.8356	10.2725	1458
294	Tamil Nadu	Erode	Ingur New	77.5814	11.2258	1035
295	Tamil Nadu	Erode	Kavilipalayam	77.2308	11.3802	2871
296	Tamil Nadu	Kancheepuram	Uthiramerur2	79.7375	12.6083	1839
297	Tamil Nadu	Karur	Enuguru Dw	78.4878	10.8547	2386
298	Tamil Nadu	Krishnagiri	Pannandur	78.2794	12.3013	1001
299	Tamil Nadu	Madurai	Thirupallai	78.1453	9.9805	1081
300	Tamil Nadu	Namakkal	Thoppur (N)	78.1517	11.1011	1032
301	Tamil Nadu	Namakkal	Pudur Siddhampoondi	77.9142	11.2361	1113
302	Tamil Nadu	Namakkal	Ezhur-Olapalayam D	78.1192	11.3658	1241
303	Tamil Nadu	Perambalur	Vijayagopalapuram	79.0314	11.2700	1418
304	Tamil Nadu	Perambalur	Padalur	78.8252	11.0960	1702
305	Tamil Nadu	Pudukkottai	Devuipattinam Dw	78.8976	9.4808	1124
306	Tamil Nadu	Pudukkottai	Sundarapatti Pz	78.7069	10.3588	1316
307	Tamil Nadu	Ramanathapuram	Kizhakakarai	78.7840	9.2394	1387
308	Tamil Nadu	Ramanathapuram	Bogalur Dw	78.7078	9.4024	4907
309	Tamil Nadu	Ramanathapuram	Mimisal Dw	79.1476	9.9283	5121
310	Tamil Nadu	Ramanathapuram	U Kosamangai Dw	78.7343	9.3152	1742
311	Tamil Nadu	Salem	Karumbapatti	77.8611	11.5822	1058
312	Tamil Nadu	Salem	Palampatti	78.0722	11.5694	1122
313	Tamil Nadu	Salem	Veerapandi Dw	78.0728	11.5736	1314
314	Tamil Nadu	Salem	Akkaripalayam	78.0500	11.3406	1463
315	Tamil Nadu	Salem	Attayampatti S.Puram	78.0750	11.5253	1882
316	Tamil Nadu	Salem	Pulaveri	78.1083	11.6083	2279
317	Tamil Nadu	Salem	Sevantampatti	78.0917	11.5583	2471
318	Tamil Nadu	Sivaganga	Tiruvengamputhur Dw	78.7858	9.8304	1266
319	Tamil Nadu	Sivaganga	Manamadurai Pz	78.4597	9.7010	1010
320	Tamil Nadu	Tirunelveli	Seetharappanallur	77.6018	8.7939	1014
321	Tamil Nadu	Tirunelveli	N. Vijayanarayanam	77.7917	8.5333	1230
322	Tamil Nadu	Tirunelveli	Kuttam	77.9366	8.3211	1617
323	Tamil Nadu	Tiruppur	Arugampalayam	77.4644	11.1247	2513
324	Tamil Nadu	Trichy	Pullambadi1	78.9125	10.9417	1051
325	Tamil Nadu	Trichy	Mudaliarchatram	78.6967	10.8003	1519
326	Tamil Nadu	Tuticorin	Tuticorin1	78.1389	8.8083	1780
327	Tamil Nadu	Villipuram	Gingee	79.4259	12.2521	1134
328	Tamil Nadu	Villipuram	Kiliyanur	79.7458	12.1008	1347
329	Tamil Nadu	Virudhunagar	Nenmeni1	78.0083	9.3250	4055

S. No.	State	District	Location	Longitude	Latitude	Cl > 1000 mg/L
330	Telangana	Khammam	Sitarampuram	80.6431	17.2008	1117
331	Telangana	Khammam	Rebbavaram	80.3369	17.1167	1377
332	Telangana	Mahabubnagar	Boravalle	77.9760	16.0254	5530
333	Telangana	Medak	Kohir	77.7172	17.6100	1200
334	Telangana	Medak	Nizampet	77.8839	18.0953	1750
335	Telangana	Medak	Pz Of Aq-I, At-Digwal	77.7133	17.6628	2500
336	Telangana	Nalgonda	Nagaram-Aq-Ii	79.0200	17.3569	1057
337	Telangana	Nalgonda	Antampet-Pz-Ii	78.8889	17.0361	1057
338	Telangana	Nalgonda	Balwemla	79.5944	17.2097	1059
339	Telangana	Nalgonda	Munugodu-Pz	79.0837	17.0773	1140
340	Telangana	Nalgonda	Nagaram	79.0339	17.3575	1256
341	Uttar Pradesh	Agra	Kheragarh	77.82308	26.9563	1234
342	Uttar Pradesh	Agra	Fatehpur Sikari	77.65428	27.08437	2801
343	Uttar Pradesh	Agra	Akola	77.88605	27.07119	2865
344	Uttar Pradesh	Mahamaya Nagar	Aharai	77.95120	27.52751	1531
345	Uttar Pradesh	Mathura	Nohjhil	77.64946	27.84581	1056
346	Uttar Pradesh	Mathura	Nagla Karan	77.83151	27.52781	1092
347	Uttar Pradesh	Mathura	Farah	77.74939	27.31028	1921
348	Uttar Pradesh	Mathura	Borpa	77.50702	27.44573	4750
349	Uttar Pradesh	Mathura	Baroli	77.56217	27.68057	7161
350	West Bengal	Howrah	Ramrajatola	88.2975	22.5892	1064
351	West Bengal	South 24 Parganas	Hatuganj	88.2538	22.1689	1443

Annexure-III**Locations having Fluoride > 1.5 mg/litre in Ground Water in Different States/UT of India**

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
1	Andhra Pradesh	Anantpur	Alampur	78.1806	14.1897	3.7
2	Andhra Pradesh	Anantpur	Asvattarayana Roppam, EW of Aq-I (1st well)	77.5403	14.0267	3.55
3	Andhra Pradesh	Anantpur	Charupalle	78.0765	14.1953	1.5
4	Andhra Pradesh	Anantpur	Chenna Kothapalli - Pz	77.62	14.27	2.2
5	Andhra Pradesh	Anantpur	Cheruvukinda Palli	77.8125	13.8697	2.7
6	Andhra Pradesh	Anantpur	Gooty	77.6156	15.1131	2.11
7	Andhra Pradesh	Anantpur	Gudipalli	77.63	13.99	2.3
8	Andhra Pradesh	Anantpur	Kalyandurg - Alt	77.11	14.5467	2.6
9	Andhra Pradesh	Anantpur	Kambalaparthi	77.9256	14.1364	2.6
10	Andhra Pradesh	Anantpur	Kammavandlapalli	77.8008	14.0047	1.6
11	Andhra Pradesh	Anantpur	Kasireddy Palli	77.7844	13.9825	2.32
12	Andhra Pradesh	Anantpur	Korrapadu	77.7133	14.7533	1.98
13	Andhra Pradesh	Anantpur	Korthikota	78.3231	13.9342	1.7
14	Andhra Pradesh	Anantpur	Kothulagutta	77.219	13.9206	2.88
15	Andhra Pradesh	Anantpur	Madakasira - 1	77.2761	13.9411	2.2
16	Andhra Pradesh	Anantpur	Malakavemula - RS	78.0575	14.27	2
17	Andhra Pradesh	Anantpur	Malreddy palli	78.2234	13.9622	2.7
18	Andhra Pradesh	Anantpur	Mekalacheruvu	78.31	14.04	2.9
19	Andhra Pradesh	Anantpur	Mohammadabad	78.0081	13.9714	2.96
20	Andhra Pradesh	Anantpur	Nagagagubbala	78.0125	14.38	1.5
21	Andhra Pradesh	Anantpur	Nayanivaripalli	77.9793	14.244	3.18
22	Andhra Pradesh	Anantpur	Palaram	77.1083	13.9567	1.5
23	Andhra Pradesh	Anantpur	Talupula	78.26	14.2436	1.82
24	Andhra Pradesh	Anantpur	Tangdikunta	77.9345	13.9425	2.3
25	Andhra Pradesh	Anantpur	VIRUPPALLI	77.14	14.64	4.8
26	Andhra Pradesh	Chittur	Valiveedu-PZ	79.0761	13.5272	1.87
27	Andhra Pradesh	East Godavari	Folkspeta	81.8404	17.3131	2.36
28	Andhra Pradesh	East Godavari	Jaderu	81.9522	17.4806	2.34
29	Andhra Pradesh	East Godavari	Sitapalli	81.7917	17.3762	1.73
30	Andhra Pradesh	Guntur	A. Muppalla	79.8415	16.2434	1.54
31	Andhra Pradesh	Guntur	Amaravati	80.3612	16.5733	1.5
32	Andhra Pradesh	Guntur	Durgi	79.5371	16.4234	1.64
33	Andhra Pradesh	Guntur	Gonuguntla Varipalem	79.7929	16.0276	1.9
34	Andhra Pradesh	Guntur	Murjampadu	79.9084	16.5906	1.8
35	Andhra Pradesh	Guntur	Pisapadu	80.1431	16.4979	2.67
36	Andhra Pradesh	Guntur	Rompicherla	79.9133	16.21	2.91
37	Andhra Pradesh	Guntur	Rompicherla Pz	79.9049	16.2128	1.92
38	Andhra Pradesh	Guntur	Santagudipadu	79.9141	16.2534	2.96
39	Andhra Pradesh	Guntur	Thummalacheruvu	79.7987	16.5255	2.04
40	Andhra Pradesh	Kadapa	Chinnamandyam	78.6883	13.9494	2.07
41	Andhra Pradesh	Kadapa	Chowkpalli	78.9239	14.8947	2.23
42	Andhra Pradesh	Kadapa	Kanagudur	78.62	14.9072	1.53
43	Andhra Pradesh	Kadapa	Mallegudupadu	78.9788	14.7929	2.56
44	Andhra Pradesh	Kadapa	Mallepalle	78.8806	14.8889	1.51
45	Andhra Pradesh	Kadapa	Vbmatham	78.8783	14.8203	1.68
46	Andhra Pradesh	Krishna	A Konduru-New	80.648	16.9632	2.22
47	Andhra Pradesh	Krishna	Jagannathapuram	80.4099	16.7294	2.76
48	Andhra Pradesh	Krishna	Kakarla	80.6352	17.0561	2.3
49	Andhra Pradesh	Krishna	MAKKAPETA	80.1915	16.9251	1.57

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
50	Andhra Pradesh	Krishna	Rangannagudem	80.9065	16.6439	2.48
51	Andhra Pradesh	Kurnool	Bapuram	77.0835	15.7886	1.7
52	Andhra Pradesh	Kurnool	Bapuram1	77.1489	15.3486	4.89
53	Andhra Pradesh	Kurnool	DODDANAKERE	77.2849	15.6994	1.55
54	Andhra Pradesh	Kurnool	Gulyan	77.0649	15.3608	2.64
55	Andhra Pradesh	Kurnool	Jagadurthi	77.89	15.46	1.5
56	Andhra Pradesh	Kurnool	Naganathanahalli	77.2333	15.5667	4.14
57	Andhra Pradesh	Kurnool	Orvakallu	78.175	15.6875	1.56
58	Andhra Pradesh	Kurnool	Sullavai	77.1156	15.4339	2.31
59	Andhra Pradesh	Kurnool	Veldurti	77.9249	15.5463	1.5
60	Andhra Pradesh	Nellore	Aravapalem	80.1564	13.8783	1.73
61	Andhra Pradesh	Nellore	Nagulavellaturu	79.5214	14.4958	1.61
62	Andhra Pradesh	Prakasham	Addanki -Pz	79.9714	15.8267	3
63	Andhra Pradesh	Prakasham	Ankireddypalle	78.97	15.45	1.8
64	Andhra Pradesh	Prakasham	Choutapalli	79.43	15.66	1.55
65	Andhra Pradesh	Prakasham	Dhupadu	79.3669	15.9164	1.67
66	Andhra Pradesh	Prakasham	Duddapadu	80.2097	15.8781	2.2
67	Andhra Pradesh	Prakasham	Gajjalakonda	79.3956	15.7425	1.7
68	Andhra Pradesh	Prakasham	Guntu Palle	79.5308	15.1504	2.68
69	Andhra Pradesh	Prakasham	Guttalaumadivrm	79.5581	16.0164	2
70	Andhra Pradesh	Prakasham	Juvvigunta	79.7289	15.4339	4.98
71	Andhra Pradesh	Prakasham	Kanigiri	79.3489	15.3933	3
72	Andhra Pradesh	Prakasham	Katurivaripalem	79.6398	15.598	3.49
73	Andhra Pradesh	Prakasham	Kondepi	79.8681	15.4133	3.76
74	Andhra Pradesh	Prakasham	Malepadu	79.7106	15.2397	2
75	Andhra Pradesh	Prakasham	Mundlapadu	78.9009	15.3312	2.26
76	Andhra Pradesh	Prakasham	Nandanavanam	79.2733	15.4669	2.5
77	Andhra Pradesh	Prakasham	Oneguruvaipalem	79.6461	15.6825	2.69
78	Andhra Pradesh	Prakasham	P Venkatapuram	79.4762	15.7625	4.71
79	Andhra Pradesh	Prakasham	Pichala Venkatapura	79.4762	15.7625	1.9
80	Andhra Pradesh	Prakasham	Rudrasamudram	79.3969	15.8375	2.12
81	Andhra Pradesh	Prakasham	Santamaguluru Pz	78.1114	14.1269	4
82	Andhra Pradesh	Prakasham	Thimmarreddypalli	79.3696	15.4839	3.27
83	Andhra Pradesh	Prakasham	Thummalacheruvu	79.2919	15.6589	2.3
84	Andhra Pradesh	Prakasham	Umamaheswarapuram	79.8265	15.8385	6.03
85	Andhra Pradesh	Prakasham	Uppalapadu	79.75	15.58	2.13
86	Andhra Pradesh	Prakasham	Velagalapaya	78.9345	15.7697	2
87	Andhra Pradesh	Prakasham	Vengaihpalem	79.5942	15.9236	2.18
88	Andhra Pradesh	Prakasham	Venkupalem	79.7469	15.3022	1.8
89	Andhra Pradesh	Srikakulam	Ponduru	83.9856	18.5217	2.4
90	Andhra Pradesh	Vijayanagram	Kokadavalasa	83.5336	18.7508	2.88
91	Andhra Pradesh	Vijayanagram	Kolivalasa	83.5222	18.5222	2.5
92	Andhra Pradesh	Vijayanagram	Kothavalasa	83.1903	17.9011	1.8
93	Andhra Pradesh	Visakapatnam	Kothakota	82.7858	17.8431	2.54
94	Andhra Pradesh	Visakapatnam	Rolugunta1	82.6692	17.9161	4.39
95	Andhra Pradesh	Visakapatnam	Vontlamamidi	82.7347	18.1011	1.72
96	Andhra Pradesh	West Godavari	Chityala	81.5984	17.0957	1.79
97	Andhra Pradesh	West Godavari	Dharmajigudem	80.992	16.8859	3.36
98	Andhra Pradesh	West Godavari	Narsimhapuram	81.5019	16.5583	6.38
99	Bihar	Gaya	Baraila More	85.155	24.6933	1.57
100	Bihar	Jamui	Harna	86.4097	24.75	2.19
101	Bihar	Jamui	Lalmatia	86.31	24.9836	1.59
102	Bihar	Muzaffarpur	Daha Chhapra NHS	84.9782	26.2222	1.55
103	Bihar	Muzaffarpur	Jahangirpur Tola NHS	85.5888	25.998	1.81
104	Bihar	Muzaffarpur	Seho NHS	85.5065	26.0065	1.75
105	Bihar	Nalanda	Asthawan	85.6253	25.2169	1.61

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
106	Bihar	Nalanda	Bihar Sharif (Rly Stn)	85.5389	25.2017	1.54
107	Bihar	Nalanda	Sare	85.6844	25.2094	1.52
108	Bihar	Nalanda	Sithuara	85.5122	25.0389	1.5
109	Bihar	Nawada	Gonama	85.5364	24.9094	1.57
110	Bihar	Nawada	Kawakol Ashram	85.8836	24.8461	1.67
111	Bihar	Nawada	Meskaur	85.3511	24.7342	1.63
112	Bihar	Nawada	Nawabganj	85.4183	24.6503	1.65
113	Bihar	Nawada	Roh	85.6861	24.875	1.61
114	Bihar	Saharsa	Belhi Teghra	86.5226	25.8196	1.9
115	Bihar	Saharsa	Kharkutti	86.5717	25.873	1.66
116	Bihar	Samastipur	Kishanpur1	85.8438	25.9276	1.69
117	Bihar	Samastipur	Patapara	85.935	25.7832	2.12
118	Bihar	Samastipur	Raipur	85.7965	25.7599	1.6
119	Bihar	Sheikhpura	Ariari	85.8597	25.0489	1.67
120	Bihar	Sheikhpura	Chewara	85.9244	25.0836	1.63
121	Bihar	Supaul	Kario	86.6493	26.1184	1.66
122	Chhattisgarh	Balodabazar	Tundri	82.6434	21.6493	1.5
123	Chhattisgarh	Balrampur	Alkadih	83.4603	23.3908	1.53
124	Chhattisgarh	Dhamtari	Banspani	81.7917	20.3667	1.5
125	Chhattisgarh	Jashpur	Palidih	83.5069	22.5581	1.57
126	Chhattisgarh	Jashpur	Patratoli	84.1172	22.7444	1.5
127	Chhattisgarh	Jashpur	Raikera(Kunkuri)	84.025	22.7708	1.57
128	Chhattisgarh	Koriya	Biharpur	82.243	23.4026	1.51
129	Chhattisgarh	Koriya	Nagpur	82.3186	23.2817	1.51
130	Chhattisgarh	Koriya	Tengni	82.7392	23.3167	1.51
131	Chhattisgarh	Raigarh	Kanakbira	83.13	21.461	1.56
132	Chhattisgarh	Raigarh	Karigashi	83.1425	22.5147	1.5
133	Chhattisgarh	Surajpur	Chainpur	82.8521	23.3857	1.8
134	Chhattisgarh	Surajpur	Deonagar	82.8033	23.24	1.5
135	Chhattisgarh	Surajpur	Majeera	82.9514	23.1482	1.52
136	Delhi	Delhi	Bank Enclave	77.2875	28.6408	6.8
137	Delhi	Delhi	Khera Kalan Pz	77.1181	28.7694	3
138	Delhi	Delhi	Sandesh Vihar	77.1461	28.695	2.6
139	Delhi	Delhi	Shekhwati Line	77.1078	28.5783	1.66
140	DNH	Dnh	Kherdi(Kathepada)	73.0321	20.1132	1.6
141	Goa	North Goa	Hasapur	73.90327	15.73925	1.7
142	Goa	South Goa	Canacona/Canconna	74.05215	15.00718	1.9
143	Goa	South Goa	Gudemal	74.12976	15.28555	4.71
144	Gujarat	Amreli	Punjabadar	71.3592	21.5305	1.94
145	Gujarat	Amreli	Sanaria	71.4319	21.5501	1.58
146	Gujarat	Amreli	Simran	71.2702	21.4311	1.52
147	Gujarat	Anand	Dharmaj	72.7874	22.4207	1.5
148	Gujarat	Anand	Ras	72.8358	22.3513	2.55
149	Gujarat	Banaskantha	Ganapipli	72.9467	24.2936	2.15
150	Gujarat	Banaskantha	Gangodra	72.3647	24.4397	1.7
151	Gujarat	Banaskantha	Hathidra	72.5988	24.2277	1.88
152	Gujarat	Banaskantha	jhat	72.3513	24.4868	1.7
153	Gujarat	Bharuch	Panoli	72.9748	21.5369	1.5
154	Gujarat	Bharuch	Sajod	72.9108	21.6192	4
155	Gujarat	Bhavnagar	Ayodhyapuram	71.8845	21.9522	1.76
156	Gujarat	Bhavnagar	Bora	71.8726	21.1629	2.18
157	Gujarat	Bhavnagar	Umralla	71.8026	21.846	1.71
158	Gujarat	Botad	Barvala	71.8942	22.1624	1.87
159	Gujarat	Chhota Udepur	Bhindol	73.8971	22.2011	2.15
160	Gujarat	Chhota Udepur	Govindpura	73.74	22.2155	2.15
161	Gujarat	Chhota Udepur	Moti chikhali	74.0806	22.0152	1.75

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
162	Gujarat	Dahod	Badpa	73.858	22.6889	2.58
163	Gujarat	Dahod	Dahod Urban-2	74.2557	22.8409	2.7
164	Gujarat	Dahod	Dahod2	74.2328	22.8311	2
165	Gujarat	Dahod	Garada	74.1228	23.1647	1.95
166	Gujarat	Dahod	Khandania	73.8966	22.6044	2.22
167	Gujarat	Dahod	Navagam Faliya	74.3061	22.6868	2.4
168	Gujarat	Devbhoomi Dwarka	Kalyanpur	69.0542	22.3076	2.45
169	Gujarat	Devbhoomi Dwarka	Navadra	69.2865	21.9399	2
170	Gujarat	Devbhumi Dwarka	Vamansa	69.1887	22.084	1.72
171	Gujarat	Gir Somnath	Dolasa	70.8472	20.8194	1.9
172	Gujarat	Gir Somnath	Una2	71.0416	20.8224	1.9
173	Gujarat	Junagadh	Kalej	70.085	21.2496	3.85
174	Gujarat	Kachchh	Devisar	69.3292	23.4028	3
175	Gujarat	Kachchh	Karagoga	69.6625	22.9417	2.55
176	Gujarat	Kachchh	Kotadi	69.1917	23.0417	3.75
177	Gujarat	Kachchh	Kuda	70.8086	23.8778	2.2
178	Gujarat	Kachchh	Samkhiari	70.5083	23.3	3.95
179	Gujarat	Kachchh	Sukhpar	69.6167	23.2083	2.45
180	Gujarat	Kachchh	Tera	68.9472	23.2833	3.3
181	Gujarat	Kachchh	Vadala	69.8556	22.9161	2.2
182	Gujarat	Mahisagar	Jokha	73.6105	23.0385	3.1
183	Gujarat	Morbi	Amar nagar	70.8244	22.9348	2.3
184	Gujarat	Morbi	Halvad2	71.1854	23.0196	2.12
185	Gujarat	Morbi	Jetpur Pithad/Jetpur	70.6408	21.7835	2.06
186	Gujarat	Morbi	Morvi	70.8529	22.8315	2.75
187	Gujarat	Navsari	Parujan	72.8363	21.0231	1.56
188	Gujarat	Panchmahal	Godhra UR_3	73.6093	22.7843	1.52
189	Gujarat	Panchmahal	Khadki Vadiya	73.5221	22.6508	1.76
190	Gujarat	Panchmahal	Ranipura	73.7442	22.7171	3
191	Gujarat	Panchmahal	Suliyat	73.8595	23.0524	1.86
192	Gujarat	Patan	Balisana	72.2542	23.8144	1.9
193	Gujarat	Patan	Gochanad	71.6244	23.7708	2
194	Gujarat	Patan	Patan2	72.1236	23.8417	5.65
195	Gujarat	Rajkot	Ganod	70.1693	21.6888	3.3
196	Gujarat	Rajkot	Upleta1	70.252	21.7295	3.7
197	Gujarat	Sabarkantha	Bhadreshwar(Daramli)	72.9832	23.7452	1.96
198	Gujarat	Sabarkantha	Gadha1	72.9377	23.6936	1.74
199	Gujarat	Sabarkantha	Hingatiya	73.0105	24.1468	2.45
200	Gujarat	Sabarkantha	Idar	73.0304	23.8417	3.2
201	Gujarat	Sabarkantha	Kesarpura(Mayal)	72.9582	23.3462	3.2
202	Gujarat	Sabarkantha	Sabalwad	72.9534	23.8709	4.45
203	Gujarat	Sabarkantha	Sakrodiya	73.048	23.5454	1.9
204	Gujarat	Surat	Sarbhon	73.0889	21.0603	1.7
205	Gujarat	Surendranagar	Dhajala	71.3978	22.3806	2.55
206	Gujarat	Surendranagar	Dhama	71.6715	23.3961	2.1
207	Gujarat	Surendranagar	Gadah	71.4	22.6278	2.2
208	Gujarat	Surendranagar	Gangad	71.9728	22.9489	4.3
209	Gujarat	Surendranagar	Kherali	71.5939	22.7138	2.3
210	Gujarat	Surendranagar	Lakhtar	71.7867	22.8541	1.55
211	Gujarat	Surendranagar	Malvan	71.7503	23.0614	5.05
212	Gujarat	Surendranagar	Muli	71.4644	22.639	3.55
213	Gujarat	Surendranagar	Nava Sudamda	71.4358	22.5397	5.15
214	Gujarat	Surendranagar	Piprali	71.3117	22.3953	4.75
215	Gujarat	Surendranagar	Rajsitapur	71.5967	22.838	1.7

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
216	Gujarat	Surendranagar	Ratanpur1	71.2747	22.8555	3.35
217	Gujarat	Surendranagar	Shiyani	71.8297	22.6626	1.65
218	Gujarat	Surendranagar	Surendranagar2	71.6167	22.7176	2.35
219	Gujarat	Surendranagar	Vadod	71.6522	22.5594	2
220	Gujarat	Surendranagar	Vaghela	71.6569	22.6578	2.1
221	Gujarat	Vadodara	Vejpur2	73.3539	22.7435	2.8
222	Haryana	Bhiwani	Dhanana	76.168	28.938	1.6
223	Haryana	Bhiwani	Haluwas	76.167	28.733	10
224	Haryana	Bhiwani	Hetampura	75.988	28.699	8
225	Haryana	Bhiwani	Loharwala	76.36	28.629	22
226	Haryana	Bhiwani	Pataudi	75.808	28.797	6.1
227	Haryana	Bhiwani	Tigrana	76.15	28.842	1.6
228	Haryana	Bhiwani	Tosham	75.917	28.875	2.1
229	Haryana	Fatehabad	Dariyapur	75.3539	29.5204	4.9
230	Haryana	Fatehabad	Tohana	75.896	29.704	1.9
231	Haryana	Gurugram	Noorgarh	76.6808	28.3561	1.8
232	Haryana	Gurugram	Wazirpur	76.9165	28.421	1.6
233	Haryana	Hisar	Adampur	75.492	29.278	5.1
234	Haryana	Hisar	Balsmand	75.5	29.339	2
235	Haryana	Hisar	Barwala	75.917	29.387	5.4
236	Haryana	Hisar	Kapro	76.113	29.379	7.2
237	Haryana	Hisar	Karnoh	75.757	29.373	5.2
238	Haryana	Hisar	Kuleri	75.66	29.361	2.2
239	Haryana	Hisar	Narnaud	75.567	29.117	1.5
240	Haryana	Hisar	Sahu	75.623	29.325	1.5
241	Haryana	Hisar	Umra	75.913	29.053	1.6
242	Haryana	Jhajjar	Bigoa	76.428	28.657	1.91
243	Haryana	Jhajjar	Chuchakwas	76.5112	28.598	4.81
244	Haryana	Jhajjar	Salahwas	76.4693	28.45	5.5
245	Haryana	Jind	Bhuslana	76.7494	29.4533	3.51
246	Haryana	Jind	Jhamula	76.339	29.1404	2
247	Haryana	Jind	Khatkaran	76.245	29.403	1.58
248	Haryana	Jind	Lochap	76.434	29.354	3.01
249	Haryana	Jind	Mohal khera	76.1256	29.6262	1.68
250	Haryana	Jind	Pilukhera	76.497	29.354	2.52
251	Haryana	Jind	Uchana	76.4874	29.4774	14.52
252	Haryana	Kaithal	Mundri	76.506	29.775	2.69
253	Haryana	Kaithal	Simla	76.2149	29.6348	2.17
254	Haryana	Karnal	Khkada Kheri	76.6442	29.5637	2.41
255	Haryana	Mahendragarh	DeroliAhir	76.1417	28.1694	2.7
256	Haryana	Mahendragarh	KheriTalwana	76.2368	28.37	4
257	Haryana	Palwal	Acheja	77.467	28.046	1.98
258	Haryana	Palwal	Hassanpur	77.49	27.97	1.89
259	Haryana	Palwal	Pirgadi	77.472	28.044	1.72
260	Haryana	Panipat	Atawala	76.7401	29.3321	16
261	Haryana	Panipat	Khalila Majra	76.7746	29.2985	2.87
262	Haryana	Panipat	Khalila Prahladpur	76.973	29.29	2.07
263	Haryana	Panipat	Patti kalyana	76.6772	28.845	1.57
264	Haryana	Panipat	Urlana Kalan	76.694	29.344	2.2
265	Haryana	Rewari	Lukhi	76.3625	28.3859	3.2
266	Haryana	Rewari	Masani	76.727	28.205	3.1
267	Haryana	Rewari	Rohliwas	76.508	28.242	2.6
268	Haryana	Rewari	Sangwari	76.6836	28.1637	1.8
269	Haryana	Sirsa	Dabwali	74.738	29.954	8.8
270	Haryana	Sirsa	Dariya Wala	74.89	29.616	7
271	Haryana	Sirsa	Jodhaka	75.222	29.497	1.8

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
272	Haryana	Sirsa	Masitan	74.72	29.886	2.5
273	Haryana	Sirsa	Mithari	74.983	29.85	1.7
274	Haryana	Sonipat	Mundlana	76.7628	29.208	1.52
275	Himachal Pradesh	Chamba	Chikadiyani	76.0939	32.5983	6.4
276	Himachal Pradesh	Chamba	Mangla	76.1044	32.5331	4.85
277	Himachal Pradesh	Sirmour	Khawaja	77.2033	30.54	2.2
278	Himachal Pradesh	Una	Daulatapur	75.9972	31.7789	1.6
279	Himachal Pradesh	Una	Kangra	76.1789	31.5056	2.3
280	Himachal Pradesh	Una	Lohara 1	76.2747	31.4306	2.6
281	Himachal Pradesh	Una	Mahadeva	75.9917	31.7897	1.7
282	J&K	Samba	Dhora	75.14	32.61	1.6
283	Jharkhand	Bokaro	Chandrapura	86.1185	23.7514	1.67
284	Jharkhand	Chatra	Bandu	84.7583	24.0685	1.64
285	Jharkhand	Chatra	Behra chocha	84.983	24.2187	1.66
286	Jharkhand	Chatra	Gidhaur	85.0247	24.1757	2.85
287	Jharkhand	Chatra	Kanha Chatti	85.0318	24.2908	2.07
288	Jharkhand	Chatra	Lohsinghna Khurd	84.8025	24.3459	2.85
289	Jharkhand	Chatra	Piri	85.1139	24.0043	1.63
290	Jharkhand	Deoghar	Ghormara	86.35	24.26	1.51
291	Jharkhand	Giridih	Tisri	86.0687	24.5759	1.61
292	Jharkhand	Godda	Siktia	87.12	24.47	1.53
293	Jharkhand	Latehar	Mahuadanr	84.1141	23.3944	2.01
294	Karnataka	Bagalkot	Badagandi	75.9406	15.9426	1.75
295	Karnataka	Bagalkot	Binjawadige	75.7527	16.0466	1.52
296	Karnataka	Bagalkot	Gorbal	75.5451	16.0108	1.84
297	Karnataka	Bagalkot	Kodihal	75.9657	15.9617	1.97
298	Karnataka	Bagalkot	Nagur	76.3016	16.0953	1.83
299	Karnataka	Bagalkot	Tumb	76.2043	16.1026	1.68
300	Karnataka	Ballari	Bailuru	76.9129	15.3503	1.5
301	Karnataka	Ballari	Tekalakota(A)	76.8797	15.5361	2
302	Karnataka	Bijapur	Ambalanur	76.2469	16.6316	1.68
303	Karnataka	Bijapur	Chadchan	75.6614	17.3113	1.8
304	Karnataka	Bijapur	Devanagaon	76.3275	17.1634	1.69
305	Karnataka	Bijapur	Hanchali	76.2266	16.6544	1.56
306	Karnataka	Bijapur	Hiremural	76.2211	16.3092	2.24
307	Karnataka	Bijapur	Hullur	75.9973	16.354	2.4
308	Karnataka	Bijapur	Mileshwara(Alternative)	76.3386	16.4667	1.84
309	Karnataka	Bijapur	Sattalgaon	76.0769	17.1435	1.72
310	Karnataka	Chikballapura	Chintamani	78.0554	13.4055	2.21
311	Karnataka	Chikballapura	Settigere	77.7543	13.5506	1.65
312	Karnataka	Chikballapura	Upparpet	78.0031	13.4034	2.38
313	Karnataka	Chikmagaluru	Ajjampur	76.0092	13.7261	1.7
314	Karnataka	Chikmagaluru	Karthikere	75.8086	13.2912	1.6
315	Karnataka	Chitradurga	Hartikote	76.649	14.071	1.9
316	Karnataka	Chitradurga	Hosadurga	76.133	13.862	2.4
317	Karnataka	Chitradurga	Maskallu	76.69	13.988	1.5
318	Karnataka	Chitradurga	Talya	76.272	14.018	2.4
319	Karnataka	Davanagere	Attigere	75.9931	14.322	1.99
320	Karnataka	Davanagere	Averegere(A)	75.9485	14.4478	1.63
321	Karnataka	Davanagere	Gopanal	75.965	14.3287	2.77
322	Karnataka	Davanagere	Hadadi	75.8897	14.3646	1.79
323	Karnataka	Davanagere	Kadaranayakanahalli	75.6894	14.4198	2.49
324	Karnataka	Davanagere	Nandi Tavare	75.7793	14.409	2.21
325	Karnataka	Gulbarga	Ghattarga	76.4092	17.0929	1.5
326	Karnataka	Gulbarga	Jeratgi	76.4494	17.0167	1.78
327	Karnataka	Gulbarga	Ravanur	76.724	17.0034	1.95

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
328	Karnataka	Gulbarga	Ravor	77.0014	17.0864	2.01
329	Karnataka	Gulbarga	Wadi	76.9858	17.0437	1.63
330	Karnataka	Kolar	Angondanahalli	78.3634	13.0658	2.04
331	Karnataka	Kolar	Bhimganapalli	78.168	12.843	1.55
332	Karnataka	Kolar	Gadarajahalli	78.3	12.9644	1.52
333	Karnataka	Kolar	Sangasandra	78.4033	13.2175	1.78
334	Karnataka	Koppal	Basapur	76.22	15.35	2.6
335	Karnataka	Koppal	Herur	76.5	15.49	2.2
336	Karnataka	Koppal	Hosahalli	75.5581	13.8597	2.1
337	Karnataka	Koppal	Igalkere	76.33	15.34	1.7
338	Karnataka	Koppal	K Hosur	76.26	15.82	2.4
339	Karnataka	Koppal	Kanakagiri	76.42	15.57	3.1
340	Karnataka	Koppal	Tawargere	76.4167	15.7667	1.5
341	Karnataka	Mandya	Anjabhuvanahalli	77.12	12.4728	1.55
342	Karnataka	Mandya	Devegowdana Koppalu	76.6844	12.4975	2.1
343	Karnataka	Mandya	Gopalapura	76.8836	12.5528	1.6
344	Karnataka	Mandya	Kallahallimandya	76.8667	12.5	1.5
345	Karnataka	Mandya	Mandya Dw	76.8847	12.5308	1.8
346	Karnataka	Mysore	Badakanakoppalu	76.38	12.51	1.99
347	Karnataka	Mysore	Hosaramanahalli	76.41	12.36	1.58
348	Karnataka	Mysore	Somnathapura	76.88	12.27	1.7
349	Karnataka	Raichur	Ambereshwar	76.57	16.26	1.8
350	Karnataka	Raichur	Ankush Doddy	76.6122	16.0344	2.3
351	Karnataka	Raichur	Arakeri	76.9508	16.275	2.2
352	Karnataka	Raichur	Bagalwad	76.89	16.05	1.5
353	Karnataka	Raichur	Chhatra	76.45	15.89	3.3
354	Karnataka	Raichur	Chkkahonakuni	76.98	16.4	3.1
355	Karnataka	Raichur	Echanal	76.4456	16.1792	1.6
356	Karnataka	Raichur	Gunda	76.5	15.82	2
357	Karnataka	Raichur	Hemanur	76.95	16.34	2.8
358	Karnataka	Raichur	Jakkaladinni	77.0658	16.1822	5.4
359	Karnataka	Raichur	Janekal	76.9539	16.0153	3.2
360	Karnataka	Raichur	Kakargal	77.0667	16.35	2.2
361	Karnataka	Raichur	Mahampur	76.4583	15.8389	1.8
362	Karnataka	Raichur	Mustur	77.01	16.31	3.7
363	Karnataka	Raichur	Sirwar	77.01	16.171	2.2
364	Karnataka	Raichur	Ulimeshwar	76.4417	15.9519	2.1
365	Karnataka	Raichur	Vanukuni	76.98	16.4	2.1
366	Karnataka	Ramnagara	Sugganahalli	77.3192	12.7994	1.6
367	Karnataka	Shivmoga	Pilingiri	75.6431	13.9533	1.6
368	Karnataka	Tumkur	Bidarigere	76.85	13.783	2.6
369	Karnataka	Tumkur	Chilanaahalli	77.183	13.7	1.5
370	Karnataka	Tumkur	Giriyamma Palya	77.199	13.732	2
371	Karnataka	Tumkur	Kotagudda	77.186	14.146	1.8
372	Karnataka	Tumkur	Palivalli	77.292	14.158	3.2
373	Karnataka	Tumkur	Pavagada	77.28	14.082	3.9
374	Karnataka	Vijayanagara	76 Venkatapura	76.5157	15.3303	1.6
375	Karnataka	Vijayanagara	Harpanahalli(Alternative)	75.9804	14.7927	1.5
376	Karnataka	Vijayanagara	Jogikallu	76.4456	14.9729	4.2
377	Karnataka	Vijayanagara	Kurugodu	76.8372	15.3441	2
378	Karnataka	Vijayanagara	No.10 Muddapura	76.5918	15.3891	1.7
379	Karnataka	Yadgir	Hulkal	76.7896	16.7555	1.8
380	Karnataka	Yadgir	Hunsagi	76.5202	16.4583	1.6
381	Karnataka	Yadgir	Malla K	76.5656	16.7394	1.9
382	Karnataka	Yadgir	Managinahal	77.037	16.7172	2.2
383	Karnataka	Yadgir	Mudubal	76.7761	16.8647	2

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
384	Karnataka	Yadgir	Shantapura	76.6569	16.388	1.5
385	Kerala	Malappuram	Manjeri	76.1201	11.1201	2.09
386	Madhya Pradesh	Anupur	JAMUDI	81.6328	23.0664	1.63
387	Madhya Pradesh	Chhatarpur	KURRI	79.72	24.8681	1.95
388	Madhya Pradesh	Datia	DURSADHA	78.644	25.71	1.51
389	Madhya Pradesh	Dindori	SALAIYA	80.947	22.91	1.67
390	Madhya Pradesh	Neemuch	BARLAI	75.32	24.424	1.84
391	Madhya Pradesh	Neemuch	MANASA	75.144	24.471	1.55
392	Madhya Pradesh	Seoni	DHANGADA	79.8614	22.3208	1.51
393	Madhya Pradesh	Seoni	GHANSOR1	79.9525	22.6542	1.69
394	Madhya Pradesh	Seoni	PALARI	79.8092	22.3081	1.84
395	Madhya Pradesh	Seoni	PANDIACHHAPPARA	80.0022	22.1264	1.76
396	Madhya Pradesh	Seoni	PIPARDAHI	79.4125	22.0506	1.71
397	Madhya Pradesh	Shajapur	ARANDIA	76.739	23.208	1.59
398	Madhya Pradesh	Shajapur	CHOUMA	76.225	23.649	1.91
399	Madhya Pradesh	Shajapur	MAKSHI NEW	76.148	23.253	1.89
400	Madhya Pradesh	Singrauli	BETAHA DAND	82.3772	24.2386	1.6
401	Maharashtra	Ahmednagar	Bhanas Hivre	74.9672	19.4894	2.08
402	Maharashtra	Beed	Ashti	75.1667	18.8	1.58
403	Maharashtra	Beed	Dharur-1	76.1086	18.7989	1.84
404	Maharashtra	Beed	Dindrur-1	76.2664	18.9892	1.52
405	Maharashtra	Beed	Shirsadevi	75.8628	19.2028	1.57
406	Maharashtra	Bhandara	Dhargaon-1	79.735	21.0997	2.06
407	Maharashtra	Bhandara	Gobarwahi	79.7264	21.5239	1.82
408	Maharashtra	Bhandara	Khair Langi	79.7844	21.4092	1.66
409	Maharashtra	Bhandara	Mundipar Sadak	79.9092	21.0614	1.6
410	Maharashtra	Bhandara	Pagora	79.6858	21.0008	1.87
411	Maharashtra	Chandrapur	Anandwan	79.2347	20.2589	4.68
412	Maharashtra	Chandrapur	Bhimni	79.7167	19.8167	1.88
413	Maharashtra	Chandrapur	Chichpalli	79.4861	20.0003	2.93
414	Maharashtra	Chandrapur	Chora	79.2344	20.1992	2.08
415	Maharashtra	Chandrapur	Kawadsi	79.4917	20.5833	1.89
416	Maharashtra	Chandrapur	Navegaon-1	79.7353	19.7119	2.66
417	Maharashtra	Chandrapur	Rajura-1	79.3714	19.7858	2.79
418	Maharashtra	Chandrapur	Ralegaon-1	79.1964	20.4094	2.38
419	Maharashtra	Chandrapur	Sakhri	79.8892	19.9986	2.78
420	Maharashtra	Chandrapur	Sawali	79.7833	20.0833	1.78
421	Maharashtra	Chandrapur	Sondo	79.3333	19.6667	1.6
422	Maharashtra	Chandrapur	Wahangaon	79.2336	20.4836	1.99
423	Maharashtra	Chandrapur	Wansadi-1	79.0522	19.7475	2.38
424	Maharashtra	Chandrapur	Warur Road-1	79.3408	19.6975	1.89
425	Maharashtra	Gadchiroli	Chaudampalli	79.85	19.6	1.77
426	Maharashtra	Gondia	Dhabetekdi	79.9647	20.79	1.65
427	Maharashtra	Gondia	Murdoli	80.2083	21.225	1.55
428	Maharashtra	Gondia	Sondad	80.0917	21.075	1.63
429	Maharashtra	Hingoli	Dongarkada	77.3747	19.3775	2.18
430	Maharashtra	Hingoli	Narsi	77.0139	19.7542	1.68
431	Maharashtra	Hingoli	Sawad	77.0525	19.7372	1.68
432	Maharashtra	Nanded	Biloli-1	77.7233	18.8992	1.58
433	Maharashtra	Nanded	Mathala	77.5469	19.5881	1.99
434	MAHARASHTRA	Nandurbar	Shahada-1	74.4761	21.5272	1.68
435	Maharashtra	Parbhani	Karegaon	76.8225	19.2661	1.6
436	Maharashtra	Parbhani	Tarborgaon	76.6083	19.3239	1.54
437	Maharashtra	Yavatmal	Bhandewada	78.8936	20.1261	2.11
438	Maharashtra	Yavatmal	Dhanki1	77.8333	19.5656	1.62
439	Odisha	Anugul	Bantala	85.0631	20.7431	1.7

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
440	Odisha	Anugul	Barhabahal	85.1	20.755	2.52
441	Odisha	Anugul	Kumunda 1	85.0264	20.9764	2.23
442	Odisha	Balangir	Bhadra	83.3308	20.4	1.61
443	Odisha	Balangir	Bijakhaman1	83.4544	20.6672	2.57
444	Odisha	Balangir	Dudukasira	83.4028	20.7369	1.97
445	Odisha	Balangir	Phulkimunda	82.8178	20.7106	1.74
446	Odisha	Bargarh	Burdapali	83.4692	21.1594	2.28
447	Odisha	Bargarh	Grinjal	83.3742	21.3367	1.9
448	Odisha	Baudh	Gaundisahi	84.1697	20.7022	4.68
449	Odisha	Baudh	Gudveli Padar	83.9283	20.7861	3.31
450	Odisha	Baudh	Laxmanpur	84.5028	20.5919	1.57
451	Odisha	Baudh	Rambhikata	84.3786	20.6894	1.74
452	Odisha	Bhadrak	Dhamnagar 1	86.4403	20.9114	2.35
453	Odisha	Debagarh	Rengalbeda	84.6833	21.4453	3.17
454	Odisha	Kalahandi	Badbasul	82.8375	19.8356	2.43
455	Odisha	Nayagarh	Lathipada 1	85.1533	20.1075	2.78
456	Odisha	Nayagarh	Purusottampur	85.1903	20.155	1.7
457	Odisha	Nuapada	Ranipur	82.7758	20.2786	1.6
458	Odisha	Nuapada	Tarbod	82.6153	20.6328	1.56
459	Odisha	Puri	Chhanijanga	86.075	20.0417	2.01
460	Odisha	Sambalpur	Bhabanipali	84.0694	21.3767	1.77
461	Odisha	Sambalpur	Bhaluchuan	84.3667	21.08	1.57
462	Odisha	Sambalpur	Bhoipali	84.07	21.4286	2.29
463	Odisha	Sambalpur	Charmal	84.2111	21.1042	1.67
464	Odisha	Sambalpur	Hatibari 1	84.1042	21.3375	1.65
465	Odisha	Sambalpur	Jhargulanda 1	84.1014	21.4206	1.51
466	Odisha	Sambalpur	Parmanpur	84.1006	21.5233	2.49
467	Odisha	Sambalpur	Sahaspur	83.9642	21.3403	1.7
468	Odisha	Sonapur	Chandajhuri	83.5611	21.08	2.44
469	Punjab	Bhatinda	Bhagi Bandar	75.0697	30.0251	1.5
470	Punjab	Bhatinda	Dyalpur Mirja	75.1318	30.4002	2.1
471	Punjab	Bhatinda	Kale Bandar	75.0023	30.0789	4.8
472	Punjab	Bhatinda	Khialiwal	74.9948	30.3101	2
473	Punjab	Bhatinda	Maiser Khanna	75.1791	30.1047	2
474	Punjab	Bhatinda	Phulla	75.107	30.2993	3.1
475	Punjab	Faridkot	Baja Khana	74.9772	30.4547	1.5
476	Punjab	Faridkot	Killi	74.5461	30.7861	4
477	Punjab	Faridkot	Matta	74.8384	30.4827	2
478	Punjab	Faridkot	Tehna	74.7916	30.6909	2.3
479	Punjab	Fazilka	Deepulana	74.1346	30.4607	3.6
480	Punjab	Fazilka	Dhaban Kokaryan	74.3272	30.1219	2.2
481	Punjab	Fazilka	Sitogano	74.3602	30.029	1.9
482	Punjab	Fazilka	Sohangarh(Coloured Samples)	74.3892	30.6003	1.5
483	Punjab	Fazilka	Swahwala	74.3009	30.6007	4.7
484	Punjab	Firozpur	Jhok harihar	74.6105	30.8616	1.8
485	Punjab	Mansa	Bhikhi	75.5354	30.0699	2.1
486	Punjab	Mansa	Budhlana	75.5444	29.9317	5.8
487	Punjab	Mansa	Dialpura	75.6642	29.8929	2.5
488	Punjab	Mansa	Fatta Maluka	75.3031	29.771	1.7
489	Punjab	Mansa	Kot Dharmu	75.3696	29.8956	1.6
490	Punjab	Mansa	Kotra Kalan	75.492	30.055	1.5
491	Punjab	Mansa	Mofar	75.4193	29.774	6.8
492	Punjab	Moga	Jaisinghwala	75.072	30.728	7.1
493	Punjab	Muktsar	Kabarwala	74.4097	30.1931	2.1
494	Punjab	Muktsar	Lambi	74.6136	30.061	2

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
495	Punjab	Patiala	Rajpura	70.594	30.474	2.4
496	Punjab	Patiala	Thua	76.554	30.5	2
497	Punjab	Sangrur	Chural Kalan	75.8	29.819	4.9
498	Punjab	Taran Taran	Aminsha Khalra	74.625	31.396	9
499	Punjab	Taran Taran	Barwala	74.803	31.224	4.5
500	Punjab	Taran Taran	Chabal	74.8	31.481	2.2
501	Punjab	Taran Taran	Rattoke	74.633	31.15	1.6
502	Rajasthan	Ajmer	BAGLIAS	74.2	25.908	1.87
503	Rajasthan	Ajmer	Barora	75.036	26.213	2.05
504	Rajasthan	Ajmer	BOGLA	75.233	25.89	1.56
505	Rajasthan	Ajmer	LUDIYANA	74.583	25.997	1.52
506	Rajasthan	Ajmer	MAIDAYABADAYA	74.37	26.12	1.89
507	Rajasthan	Ajmer	MASUDA1	74.513	26.092	1.88
508	Rajasthan	Ajmer	NARBADKHERA	74.283	26.05	2.1
509	Rajasthan	Ajmer	SARWAD	75	26.05	1.57
510	Rajasthan	Alwar	BOLNI	76.796	27.866	6.6
511	Rajasthan	Alwar	RAMGARH1	76.814	27.594	2.25
512	Rajasthan	Alwar	Reni	76.7389	27.1775	3.04
513	Rajasthan	Alwar	Tehla	76.4	27.2375	1.54
514	Rajasthan	Banswara	Bagidora	74.267	23.404	1.77
515	Rajasthan	Banswara	Banswara1	74.45	23.533	1.65
516	Rajasthan	Banswara	CHOTA DUNGRA	74.29	23.172	1.94
517	Rajasthan	Banswara	GANORA	74.253	23.767	2.97
518	Rajasthan	Banswara	Maudi Maska	74.31	23.15	1.8
519	Rajasthan	Banswara	Padla Barora	74.519	23.536	1.87
520	Rajasthan	Banswara	Samla Sahar	74.25	23.21	1.55
521	Rajasthan	Barmer	ARNIYALI	71.968	25.467	1.55
522	Rajasthan	Barmer	BHOGINJI KA MEETHA	72.1257	25.5149	2
523	Rajasthan	Barmer	CHAUHTAN	71.075	25.475	1.83
524	Rajasthan	Barmer	DERASAR	71.163	25.776	1.73
525	Rajasthan	Barmer	DHORIMANA	71.4352	25.2344	1.78
526	Rajasthan	Barmer	GUDAMALANI	71.6988	25.214	3.13
527	Rajasthan	Barmer	KOLOO	71.713	26.0274	1.88
528	Rajasthan	Barmer	PANCHLA	70.167	25.992	1.77
529	Rajasthan	Barmer	RAMSAR	70.8719	25.7303	3.63
530	Rajasthan	Barmer	SANAWARA	71.4	25.48	1.54
531	Rajasthan	Barmer	Santara	71.968	25.998	2.18
532	Rajasthan	Barmer	SANWLOR	71.2333	25.5858	1.7
533	Rajasthan	Barmer	SASIO KA KUA	71.4125	25.7042	1.82
534	Rajasthan	Barmer	SAYLA	71.713	26.0274	2.65
535	Rajasthan	Barmer	SIHANI	71.083	25.755	1.75
536	Rajasthan	Barmer	THOB	72.358	26.05	1.6
537	Rajasthan	Barmer	Thumbli	72.4886	26.2036	2.2
538	Rajasthan	Bharatpur	Gopalgarh	77.0633	27.6547	3
539	Rajasthan	Bharatpur	Kheria Mod	77.383	26.95	5.8
540	Rajasthan	Bharatpur	NADBAI	77.213	27.208	4.55
541	Rajasthan	Bharatpur	Nagar	77.1	27.417	3.4
542	Rajasthan	Bharatpur	PAHARI	77.083	27.7	2
543	Rajasthan	Bharatpur	Weir	77.1773	27.0126	2.01
544	Rajasthan	Bhilwara	Bhojpur_Pz	74.8571	25.45	1.6
545	Rajasthan	Bhilwara	Dahimatha	74.301	25.528	1.61
546	Rajasthan	Bhilwara	GANGAPUR1	74.26	25.217	1.55
547	Rajasthan	Bhilwara	Jeewaliya	74.508	25.544	1.91
548	Rajasthan	Bhilwara	Karoi Kalan	74.425	25.223	1.61
549	Rajasthan	Bhilwara	malas	74.3294	25.5242	1.57
550	Rajasthan	Bhilwara	Mandal	74.5693	25.4533	2.63

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
551	Rajasthan	Bikaner	BADERAN	73.764	28.701	13.5
552	Rajasthan	Bikaner	BAJJU	72.508	27.933	12
553	Rajasthan	Bikaner	GODU	72.297	27.992	3.5
554	Rajasthan	Bikaner	HARIASAR	73.811	28.576	12.6
555	Rajasthan	Bikaner	kaloo	73.8853	28.3889	2.2
556	Rajasthan	Bikaner	KASTURIA	73.488	28.329	2.25
557	Rajasthan	Bikaner	KHARBARO	73.408	28.933	2.2
558	Rajasthan	Bikaner	KOLAYAT	72.954	27.842	2.2
559	Rajasthan	Bikaner	Lakhansar	73.35	28.87	1.5
560	Rajasthan	Bikaner	LAKHUSAR	73.192	28.317	3.6
561	Rajasthan	Bikaner	MANARIA	73.772	28.758	4.45
562	Rajasthan	Bikaner	RANER	73.288	28.885	2
563	Rajasthan	Bikaner	RANJITPURA	72.125	28.026	1.7
564	Rajasthan	Bundi	BALLOP	75.75	25.267	3
565	Rajasthan	Bundi	GAINDOLI	75.996	25.542	2.7
566	Rajasthan	Bundi	KESHORAIPATAN	75.931	25.319	1.79
567	Rajasthan	Bundi	MAIJA	75.888	25.408	2
568	Rajasthan	Bundi	SATUR	75.515	25.437	1.8
569	Rajasthan	Churu	Churu	74.9275	28.2955	1.95
570	Rajasthan	Churu	DUDWA KHARA	75.079	28.471	10.7
571	Rajasthan	Churu	GULERIYA	74.419	27.738	2.2
572	Rajasthan	Churu	MEHRASAR	74.538	28.357	2.5
573	Rajasthan	Churu	MITTASAR	74.384	28.417	1.7
574	Rajasthan	Churu	NEEMA	75.4722	28.4667	3.9
575	Rajasthan	Churu	RAJGARH1	75.375	28.633	14.8
576	Rajasthan	Churu	SADASAR	74.35	28.7	2
577	Rajasthan	Churu	SARDARSHAHAR	74.486	28.439	15.25
578	Rajasthan	Churu	Sujangarh	74.4808	27.7069	15.3
579	Rajasthan	Churu	Taranagar	75.0342	28.6879	3.05
580	Rajasthan	Dausa	Jasuta	76.333	26.967	2.35
581	Rajasthan	Dausa	Khedla	76.9817	26.9114	1.5
582	Rajasthan	Dausa	Lakhanpur	76.256	26.52	3.4
583	Rajasthan	Dungarpur	NAVAL SHYAM	73.574	23.842	1.57
584	Rajasthan	Dungarpur	NAYADERA	73.683	23.833	2.44
585	Rajasthan	Ganganagar	Birdhwal1	73.919	29.117	1.71
586	Rajasthan	Ganganagar	GANESHGARH	73.9	29.746	1.98
587	Rajasthan	Ganganagar	KARANPUR1	73.45	29.817	2
588	Rajasthan	Ganganagar	KHAL	73.367	29.083	1.9
589	Rajasthan	Ganganagar	PIPERAN	73.9	29.248	4.38
590	Rajasthan	Ganganagar	Rupnagar	73.4411	29.7958	2.9
591	Rajasthan	Ganganagar	SURANWALI	73.917	29.696	3.15
592	Rajasthan	Ganganagar	TATARSAR	73.733	29.808	3.95
593	Rajasthan	Hanumangarh	BISRASAR	74.278	28.867	1.9
594	Rajasthan	Hanumangarh	PALLU	74.2	28.917	8.75
595	Rajasthan	Hanumangarh	PANDITAWALI	74.2	29.413	1.86
596	Rajasthan	Jaipur	Chittora	75.702	26.638	1.72
597	Rajasthan	Jaipur	DAWACH	75.754	26.567	1.62
598	Rajasthan	Jaipur	Didwata	75.73	26.494	2
599	Rajasthan	Jaipur	RASALA	76.203	27.114	1.62
600	Rajasthan	Jaipur	Sambhar	75.22	26.906	1.53
601	Rajasthan	Jaisalmer	Baishaki	70.54	27.02	2.49
602	Rajasthan	Jaisalmer	Chodahariya	70.5533	27.06	3.58
603	Rajasthan	Jaisalmer	GUDI KA TALA	71.604	26.763	1.62
604	Rajasthan	Jaisalmer	KALEWA	71.904	26.806	1.67
605	Rajasthan	Jaisalmer	Kodiyasar	71.275	26.483	2.37
606	Rajasthan	Jaisalmer	Longewala	71.7667	27.15	1.8

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
607	Rajasthan	Jaisalmer	RAJGARH1	71.545	26.538	2.44
608	Rajasthan	Jaisalmer	RAMA	71.043	26.5528	1.72
609	Rajasthan	Jaisalmer	Ranau	70.45	27.5933	3.53
610	Rajasthan	Jaisalmer	SADEWALA	70.244	27.635	1.95
611	Rajasthan	Jaisalmer	Sankara	71.5818	26.7277	1.91
612	Rajasthan	Jaisalmer	Sataya_DW	71.659	27.42	1.82
613	Rajasthan	Jaisalmer	Shekhawala	71.423	27.33	2.25
614	Rajasthan	Jalore	AHORE	72.7936	25.3658	7
615	Rajasthan	Jalore	BAGRA	72.6	25.1922	1.55
616	Rajasthan	Jalore	BHAGALBHIM	72.2227	25.0188	2.89
617	Rajasthan	Jalore	BHINMAL	72.2625	25.0125	2.27
618	Rajasthan	Jalore	DHANAWARA	72.2022	24.9675	2.85
619	Rajasthan	Jalore	GUDBALOTAN	72.8592	25.3403	4.47
620	Rajasthan	Jalore	JALORE	72.6306	25.3346	1.76
621	Rajasthan	Jalore	JASWANTPURA	72.4512	24.8176	1.95
622	Rajasthan	Jalore	LATHERMAIL	72.3461	25.0536	1.69
623	Rajasthan	Jalore	NIMLA	72.866	25.531	3.4
624	Rajasthan	Jalore	SANCHORE	71.7946	24.7585	2.19
625	Rajasthan	Jhalawar	DAG1	75.835	23.949	1.96
626	Rajasthan	Jhalawar	KARVAN KALA	75.833	24.178	5
627	Rajasthan	Jhunjhunu	Alsisar	75.2931	28.3037	4.2
628	Rajasthan	Jhunjhunu	Birmi	75.1778	28.2	6.5
629	Rajasthan	Jhunjhunu	CHURELA	75.258	28.164	1.55
630	Rajasthan	Jhunjhunu	Jhunjhunu	75.3852	28.1135	1.8
631	Rajasthan	Jhunjhunu	Khudana	75.522	28.188	2.9
632	Rajasthan	Jodhpur	BENAN	73.421	26.317	3.9
633	Rajasthan	Jodhpur	Bhandu kalan Uranium Hotspot	72.9015	26.1294	9.65
634	Rajasthan	Jodhpur	Bhavi	73.6067	26.2317	6.6
635	Rajasthan	Jodhpur	Bilara Block HQ	73.7106	26.1969	2
636	Rajasthan	Jodhpur	Chabon ki dhani Block HQ	73.1671	26.6314	5.26
637	Rajasthan	Jodhpur	Daarmi	73.6397	26.7339	2.1
638	Rajasthan	Jodhpur	DEVATRA	73.378	26.51	1.52
639	Rajasthan	Jodhpur	DHAWA	72.742	26.058	15.5
640	Rajasthan	Jodhpur	Gangani	73.212	26.51	4.6
641	Rajasthan	Jodhpur	Hemnagar	72.7817	26.2961	3
642	Rajasthan	Jodhpur	KARANI	72.825	26.272	1.63
643	Rajasthan	Jodhpur	Khatawas Uranium Hotspot	72.8027	26.1193	3.15
644	Rajasthan	Jodhpur	Kheri Salwa Uranium Hot spot	73.3658	26.4352	8.5
645	Rajasthan	Jodhpur	KHUDALA	72.832	26.151	3.1
646	Rajasthan	Jodhpur	Kudi	73.0634	26.2088	3.8
647	Rajasthan	Jodhpur	Kukunda Uranium Hotspot	73.3223	26.346	3.87
648	Rajasthan	Jodhpur	Luni	73.021	26	2.4
649	Rajasthan	Jodhpur	MOGRA	73.033	26.117	1.9
650	Rajasthan	Jodhpur	Osian	72.8964	26.7411	1.51
651	Rajasthan	Jodhpur	PALI	73.1445	26.1485	2.17
652	Rajasthan	Jodhpur	Phalodi	72.3783	27.1225	1.71
653	Rajasthan	Jodhpur	Ramdawas	73.3658	26.3658	4.8
654	Rajasthan	Jodhpur	RARON KI DHANI	72.775	26.194	3.8
655	Rajasthan	Jodhpur	ROHIT	73.1603	26.1485	2.4
656	Rajasthan	Jodhpur	Samdari Block HQ	72.5756	26.8488	2.1
657	Rajasthan	Karauli	BHAUAPURA	77.182	26.542	4
658	Rajasthan	Karauli	ISLAMPUR	77.017	26.7	3.25
659	Rajasthan	Karauli	Karauli	77.0172	26.5014	10.4

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
660	Rajasthan	Kota	RATTANPURA	76.3	25.367	1.94
661	Rajasthan	Nagaur	Bagot	74.5911	26.8131	1.75
662	Rajasthan	Nagaur	CHOSLI	74.255	26.93	4.8
663	Rajasthan	Nagaur	Dagawas Block HQ	74.058	26.6458	3.1
664	Rajasthan	Nagaur	Degana	74.3547	26.8181	2.5
665	Rajasthan	Nagaur	Jayal Block HQ	74.1863	27.2186	2.8
666	Rajasthan	Nagaur	Kheevsar Block HQ	73.414	26.9647	2.45
667	Rajasthan	Nagaur	Mundawa Block HQ	73.82	27.058	3.2
668	Rajasthan	Nagaur	Nagaur	73.75	27.1833	2.7
669	Rajasthan	Nagaur	RIAN	74.25	26.533	2.25
670	Rajasthan	Pali	Bassi	74.0631	26.3294	5.5
671	Rajasthan	Pali	DESURI	73.5582	25.2763	1.58
672	Rajasthan	Pali	GHANERAO	73.525	25.233	3.5
673	Rajasthan	Pali	KARIASODA	73.638	25.833	1.8
674	Rajasthan	Pali	KIRWA	73.258	25.496	2.54
675	Rajasthan	Pali	Prathvipura	73.8167	26.2	2.6
676	Rajasthan	Pali	RADAWAS	73.292	25.183	2
677	Rajasthan	Pali	RANI	73.3158	25.3425	1.94
678	Rajasthan	Pali	SUMERPUR	73.0907	25.1437	6.14
679	Rajasthan	Pali	VAED	72.967	25.724	2.83
680	Rajasthan	Pratapgarh	Datla Kund	74.72	23.96	1.6
681	Rajasthan	Rajsamand	Bhim	74.0792	25.7433	2.61
682	Rajasthan	Rajsamand	Deogarh	73.9058	25.5286	1.73
683	Rajasthan	Rajsamand	DEWAIR	73.822	25.421	1.56
684	Rajasthan	Rajsamand	GAVARDI	74.1	24.904	1.72
685	Rajasthan	Rajsamand	RAILMAGRA1	74.117	25.033	1.82
686	Rajasthan	Rajsamand	THIKARWAS	73.98	25.6	1.51
687	Rajasthan	Sawai Madhopur	BONALI	76.254	26.354	2.66
688	Rajasthan	Sawai Madhopur	GANGAPUR2	76.733	26.483	3.7
689	Rajasthan	Sawai Madhopur	KUSHTALA	76.267	25.967	2
690	Rajasthan	Sawai Madhopur	MALARNACHOR	76.381	26.306	1.82
691	Rajasthan	Sawai Madhopur	PIPLAI	76.553	26.504	4.65
692	Rajasthan	Sawai Madhopur	SULTANPUR	76.3858	26.2528	4.55
693	Rajasthan	Sawai Madhopur	SURWAL	76.361	26.088	1.69
694	Rajasthan	Sawai Madhopur	TOND	76.397	26.367	1.7
695	Rajasthan	Sawai Madhopur	TONK	76.2542	26.3542	4.07
696	Rajasthan	Sikar	Fatehpur	74.9622	27.9814	2.7
697	Rajasthan	Sikar	Laxmangarh	75.0183	27.8433	1.5
698	Rajasthan	Sirohi	AMBESHWARJI	72.892	24.956	2.61
699	Rajasthan	Sirohi	BARLOT	72.717	24.995	1.52
700	Rajasthan	Sirohi	JEERAWAL	72.4917	24.6389	2.5
701	Rajasthan	Sirohi	KALANDARI	72.6875	24.925	2.32
702	Rajasthan	Sirohi	MANPUR	72.7592	24.5044	2
703	Rajasthan	Sirohi	PALRI(M)	72.925	25.0153	3.15
704	Rajasthan	Sirohi	SHEOGANJ	73.0451	25.145	2.17
705	Rajasthan	Tonk	DEOLI	75.85	26.2417	1.93
706	Rajasthan	Tonk	Ghans	75.8839	25.9325	4.84
707	Rajasthan	Tonk	JAISINGHPUR	75.498	26.409	4.58
708	Rajasthan	Tonk	MALPURA1	75.383	26.283	2.3
709	Rajasthan	Tonk	Mehndwas	75.725	26.111	2.45
710	Rajasthan	Tonk	Rustamganj	75.5856	25.9	3.41
711	Rajasthan	Tonk	UNIYARA	76.0267	25.9156	1.64
712	Rajasthan	Udaipur	BHINDER	74.167	24.506	1.61
713	Rajasthan	Udaipur	SAVINA	73.714	24.506	1.51
714	Rajasthan	Udaipur	SEMARI	73.85	24.065	1.97
715	Tamil Nadu	Ariyalur	V.Ramanapuram OW	79.1096	11.1754	1.58

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
716	Tamil Nadu	Coimbatore	Angalakurichi	76.9994	10.525	1.62
717	Tamil Nadu	Coimbatore	Cwc Campus pz	77.0006	11.0414	1.57
718	Tamil Nadu	Coimbatore	Kunnakalpalayam pz	77.3272	11.0456	1.54
719	Tamil Nadu	Coimbatore	Pallapalayam pz	77.2181	10.5256	1.57
720	Tamil Nadu	Coimbatore	Samathur Hss pz	77.0089	10.6022	1.58
721	Tamil Nadu	Coimbatore	Sarkar samakulam pz	77.0333	11.1333	1.55
722	Tamil Nadu	Coimbatore	Tn Urban Studies pz	76.9419	11.0219	1.7
723	Tamil Nadu	Cuddalore	Teerthanagiri	79.679	11.5693	1.55
724	Tamil Nadu	Cuddalore	Tekkumellur (Therkumelur)	79.5278	11.5894	1.95
725	Tamil Nadu	Cuddalore	Thaiyalkunapattinam	79.6832	11.5703	1.53
726	Tamil Nadu	Cuddalore	Theerthagari EW	79.5563	11.5604	1.86
727	Tamil Nadu	Cuddalore	Vadalur(o.w)	79.5542	11.5687	1.8
728	Tamil Nadu	Dindigul	Nandavanampatti	77.9853	10.3756	2.96
729	Tamil Nadu	Dindigul	Pallapatti	77.5457	10.0805	2.72
730	Tamil Nadu	Dindigul	Sanarpatti	78.087	10.3328	2.76
731	Tamil Nadu	Erode	Archalur	77.7	11.1625	1.69
732	Tamil Nadu	Erode	E.Vellampalayam pz	77.6806	11.1697	1.77
733	Tamil Nadu	Erode	Elmattur	77.7792	11.1944	1.6
734	Tamil Nadu	Erode	Erode2	77.7333	11.3333	1.54
735	Tamil Nadu	Erode	Karaiyur1	77.5944	10.7639	1.56
736	Tamil Nadu	Erode	Kavilipalayam	77.2308	11.3802	1.73
737	Tamil Nadu	Erode	Kosanam pz	77.3578	11.3711	1.56
738	Tamil Nadu	Erode	Nagalapuram pz	77.3628	11.0756	1.63
739	Tamil Nadu	Erode	Nambiyur	77.3208	11.3606	1.88
740	Tamil Nadu	Erode	Nilangelvalasu pz	77.7342	10.6431	1.62
741	Tamil Nadu	Erode	Otti Vilangadu	77.4186	11.2242	1.83
742	Tamil Nadu	Erode	Papayampudur	77.4678	10.6567	1.65
743	Tamil Nadu	Erode	Puduppai pz	77.7225	10.9586	1.82
744	Tamil Nadu	Kanyakumari	Chenpagaramanpudur	77.5099	8.2599	1.82
745	Tamil Nadu	Karur	Jagatabi	78.1667	10.8417	1.56
746	Tamil Nadu	Karur	Vellianani	78.1333	10.8667	1.58
747	Tamil Nadu	Krishnagiri	Enusonai	78.0175	12.6138	1.84
748	Tamil Nadu	Krishnagiri	Nattamaikottai	78.2154	12.4721	1.69
749	Tamil Nadu	Krishnagiri	Vappanapalli	78.1925	12.6998	1.7
750	Tamil Nadu	Madurai	Chellampatti	77.5346	9.5638	2.6
751	Tamil Nadu	Madurai	Kolluveeranpatti	77.8856	9.7069	2.52
752	Tamil Nadu	Madurai	Kolluveeranpatti pz	77.5308	9.4225	3.14
753	Tamil Nadu	Madurai	P.Ammappatti pz	77.8947	9.8458	1.53
754	Tamil Nadu	Madurai	Surakulam pz	78.0567	9.8364	2.2
755	Tamil Nadu	Madurai	Thirupallai	78.1389	9.9869	1.96
756	Tamil Nadu	Madurai	Tirumangalam pz	77.8833	9.9208	1.59
757	Tamil Nadu	Namakkal	Ainthu Panai	77.8089	11.3633	1.94
758	Tamil Nadu	Namakkal	Annai sathanagar	77.7639	11.3508	1.55
759	Tamil Nadu	Namakkal	Elachipalayam new	78.0125	11.3847	1.74
760	Tamil Nadu	Namakkal	Ezhur-Olapalayam D	78.1192	11.3658	1.68
761	Tamil Nadu	Namakkal	Gurusamipalayam	78.1344	11.4342	1.74
762	Tamil Nadu	Namakkal	Irumbapalam	77.9917	11.2042	1.62
763	Tamil Nadu	Namakkal	Kattipalayam	78.0336	11.3156	1.66
764	Tamil Nadu	Namakkal	Kumbakkottai	78.3044	11.4717	1.83
765	Tamil Nadu	Namakkal	Pottireddipatti	78.2744	11.1689	1.68
766	Tamil Nadu	Namakkal	Ramapuram	78.0092	11.4403	1.68
767	Tamil Nadu	Namakkal	Semmadaipalayam	77.9344	11.1472	1.68
768	Tamil Nadu	Namakkal	Solasiramani	77.9083	11.25	1.65
769	Tamil Nadu	Namakkal	SPN Nagar	78.22	11.1411	1.7
770	Tamil Nadu	Namakkal	Thoppur (N)	78.1517	11.1011	1.77

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
771	Tamil Nadu	Namakkal	Vaiyappamalai	78.0833	11.3333	1.77
772	Tamil Nadu	Namakkal	Velur	78.0033	11.1083	1.59
773	Tamil Nadu	Perambalur	Chitali	78.9682	11.2406	3
774	Tamil Nadu	Perambalur	Perambalur	78.9364	11.1586	1.51
775	Tamil Nadu	Perambalur	Ranjankudi(Mangalamedu)	78.9412	11.3472	1.94
776	Tamil Nadu	Pudukkottai	Alavoyal Pz	78.5464	10.3234	1.94
777	Tamil Nadu	Pudukkottai	Vayyapuri DW	78.6172	10.3469	2.44
778	Tamil Nadu	Pudukkottai	Viralimalai DW	78.5499	10.6083	2.76
779	Tamil Nadu	Pudukkottai	Thirukkalambar Pz	78.4912	10.2055	2.04
780	Tamil Nadu	Ramanathapuram	Kizhakakarai	78.784	9.2394	2.28
781	Tamil Nadu	Ramanathapuram	Parthibanur DW	78.4511	9.5805	1.53
782	Tamil Nadu	Salem	Elampillai dw	78.0108	11.6089	2.15
783	Tamil Nadu	Salem	Idapadi new	77.85	11.5839	1.95
784	Tamil Nadu	Salem	Jalakandapuram	77.8722	11.7056	1.59
785	Tamil Nadu	Salem	Karumbapatti	77.8611	11.5822	1.75
786	Tamil Nadu	Salem	Karuppur	78.0769	11.7178	1.91
787	Tamil Nadu	Salem	Konganapuram	77.9	11.5667	1.8
788	Tamil Nadu	Salem	Muttur (Karumalikoodal)dw	77.8297	11.8075	1.84
789	Tamil Nadu	Salem	Naikarapatty dw	78.1061	11.6219	1.81
790	Tamil Nadu	Salem	Palampatti	78.0722	11.5694	1.68
791	Tamil Nadu	Salem	Panamarathupatti2	78.1931	11.5903	1.81
792	Tamil Nadu	Salem	Salem surviellance	78.1664	11.6594	1.98
793	Tamil Nadu	Salem	Sevantampatti	78.0917	11.5583	1.78
794	Tamil Nadu	Salem	Vedukathampatty dw	78.0819	11.6528	1.63
795	Tamil Nadu	Sivaganga	Nadumanaikadu Dw	79.0844	9.278	2.62
796	Tamil Nadu	Sivaganga	Sivagangai DW	78.4985	9.8527	1.62
797	Tamil Nadu	Theni	Balakombai pz	77.6233	9.9036	2.64
798	Tamil Nadu	Theni	Bodinaickanur dw	77.5717	10.0989	2.36
799	Tamil Nadu	Theni	Cumbum	77.2847	9.7417	7.6
800	Tamil Nadu	Theni	Kodangipatti pz	77.4306	9.9917	2.08
801	Tamil Nadu	Theni	Ramakrishnapuram pz	77.3017	9.9392	1.6
802	Tamil Nadu	Theni	Silverpatti	77.6204	10.1123	1.53
803	Tamil Nadu	Tirunelveli	Chettikulam	77.6167	8.1667	1.63
804	Tamil Nadu	Tirunelveli	Naduvapatty	77.8014	9.2417	1.72
805	Tamil Nadu	Tirunelveli	Rajapathi OW	77.7696	8.8517	1.67
806	Tamil Nadu	Tirunelveli	Sivalarkulam OW	77.5294	8.8693	1.78
807	Tamil Nadu	Tirunelveli	Tachchnallur	77.7	8.7458	1.54
808	Tamil Nadu	Tirunelveli	Tirunelveli1	77.7222	8.7056	1.56
809	Tamil Nadu	Tiruppur	Karamadai	77.2125	11.2458	1.6
810	Tamil Nadu	Tiruppur	KaravallurPZ	77.1692	11.2894	1.58
811	Tamil Nadu	Tiruppur	Weekly Market	77.3431	11.0881	1.56
812	Tamil Nadu	Tuticorin	Eppodumvendram	78.0458	9.0292	1.51
813	Tamil Nadu	Tuticorin	Kurukkuchalai	78.0917	8.9306	1.5
814	Tamil Nadu	Tuticorin	Pasuvanthanai	77.9596	9.0013	1.66
815	Tamil Nadu	Tuticorin	Srivaikundam1	77.9083	8.625	1.73
816	Tamil Nadu	Tuticorin	Tuticorin1	78.1389	8.8083	1.65
817	Tamil Nadu	Tuticorin	Vembur	78.0819	9.325	1.6
818	Tamil Nadu	Vellore	Echipudhur (Vellore dt)	79.2819	12.9058	1.8
819	Tamil Nadu	Villipuram	Allampundi	79.3406	12.2483	1.8
820	Tamil Nadu	Villipuram	Gopalapuram-Peramandur	79.5702	12.2285	1.53
821	Tamil Nadu	Villipuram	Pidagam (Elavarasanarkottai) (A)	79.1792	11.7206	1.63
822	Tamil Nadu	Villipuram	Rishivandiyam	79.0947	11.8131	1.76
823	Tamil Nadu	Virudhunagar	Alangulam	77.6861	9.3639	1.69

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
824	Tamil Nadu	Virudhunagar	Aviur dw	78.1008	9.7389	1.71
825	Tamil Nadu	Virudhunagar	Kundarapatty	77.77	9.63	1.88
826	Tamil Nadu	Virudhunagar	Mudukkankulam	78.2058	9.1508	1.73
827	Tamil Nadu	Virudhunagar	Muntalapuram	77.8894	9.0172	1.79
828	Tamil Nadu	Virudhunagar	Nathampatti OW	77.7486	9.6042	1.84
829	Tamil Nadu	Virudhunagar	Palavanatham	78.075	9.5667	1.7
830	Tamil Nadu	Virudhunagar	Pattampudur OW	77.9336	9.4914	1.59
831	Tamil Nadu	Virudhunagar	Sevalpatti	77.9583	9.5583	1.84
832	Tamil Nadu	Virudhunagar	Vadapatti	77.755	9.5108	1.67
833	Tamil Nadu	Virudhunagar	Vembakkottai-OW	77.7667	9.3333	1.81
834	Tamil Nadu	Virudhunagar	Virudhunagar	77.9542	9.5833	1.67
835	Tamil Nadu	Virudhunagar	Watrap	77.6335	9.6358	1.66
836	Telangana	Adilabad	Basar - PZ	77.9451	18.8722	4.37
837	Telangana	Adilabad	Bhimini -PZ-1	79.5802	19.1959	4.5
838	Telangana	Adilabad	Bhimini-PZ- 2	79.5802	19.1959	2.64
839	Telangana	Adilabad	Boath-PZ	78.3579	19.3441	7.29
840	Telangana	Adilabad	Chincholi (bk)	78.3389	19.1434	1.51
841	Telangana	Adilabad	Dehgaon	78.3818	19.4759	1.5
842	Telangana	Adilabad	Indanpally	78.9424	19.1498	2.9
843	Telangana	Adilabad	Jainoor- PZ	78.9066	19.3768	6.56
844	Telangana	Adilabad	Jannaram	78.997	19.117	3.06
845	Telangana	Adilabad	Kachkanti	78.5656	19.6541	1.68
846	Telangana	Adilabad	Kadem	78.7809	19.0982	1.6
847	Telangana	Adilabad	Kumari	78.4147	19.3579	3.29
848	Telangana	Adilabad	Manmad	78.1143	19.0557	2.83
849	Telangana	Adilabad	Morkhandi	78.3403	19.5261	9.08
850	Telangana	Adilabad	Pochampalli	78.8197	17.3472	1.88
851	Telangana	Adilabad	Rebbenna1	79.4147	19.2596	2
852	Telangana	Adilabad	Sitagondi	78.4937	19.581	1.5
853	Telangana	Adilabad	Soan	78.3815	19.0091	1.59
854	Telangana	Adilabad	Tapalpur	79.0766	19.0626	1.93
855	Telangana	Adilabad	Toyaguda	78.7049	19.6393	1.63
856	Telangana	Hyderabad	Erragadda-PZ	78.4361	17.4458	2.48
857	Telangana	Hyderabad	Falaknama2	78.4682	17.3345	1.8
858	Telangana	Hyderabad	Picket-1-PZ	78.4957	17.4518	1.55
859	Telangana	Hyderabad	Tirumalgi-PZ	78.5109	17.4753	1.9
860	Telangana	Karimnagar	Boinpally Pz	78.9364	18.5031	2.53
861	Telangana	Karimnagar	Buswapuram1	79.0565	18.1031	1.75
862	Telangana	Karimnagar	Kalwacherla	79.5341	18.6363	2.78
863	Telangana	Karimnagar	Kondapalakal	79.2912	18.3732	1.83
864	Telangana	Karimnagar	Kothakonda Pz	79.3267	18.0428	1.87
865	Telangana	Karimnagar	Kothapet	79.1953	18.778	2.44
866	Telangana	Karimnagar	Mohanraopet1	78.7803	18.8097	1.92
867	Telangana	Karimnagar	Munjampalli Pz (maredupalli)	79.2718	18.7781	1.6
868	Telangana	Karimnagar	Nusthulpur Pz	79.178	18.3186	1.69
869	Telangana	Karimnagar	Palthem	79.3216	18.6821	1.66
870	Telangana	Karimnagar	Polosa	78.9476	18.8391	2.33
871	Telangana	Karimnagar	Renukunta Pz	79.1236	18.2911	2.41
872	Telangana	Karimnagar	Samudrala Pz	79.1153	18.11	1.73
873	Telangana	Karimnagar	Suddala	78.7952	18.4697	1.96
874	Telangana	Karimnagar	Tadikal	79.2894	18.3123	1.53
875	Telangana	Karimnagar	Thirumalapur	78.8647	18.6514	1.7
876	Telangana	Karimnagar	Venkatraopalli Pz	78.959	18.4356	2.07
877	Telangana	Karimnagar	Vilasagar	78.9614	18.4717	1.58
878	Telangana	Karimnagar	Yelakaturthy-Pz	79.4494	18.0996	2.95

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
879	Telangana	Khammam	Ashwapuram	80.8306	17.8292	3.44
880	Telangana	Khammam	Edugarallapalli	81.1714	17.7544	1.96
881	Telangana	Khammam	Enkur - Pz	80.4419	17.3367	1.64
882	Telangana	Khammam	K.M Banjara (Telagavaram)	80.6585	17.14	1.62
883	Telangana	Khammam	Madharam-Pz	80.2264	17.5428	1.9
884	Telangana	Khammam	Madira1	80.3644	16.9244	1.56
885	Telangana	Khammam	Mukundapuram	80.2486	17.5692	2.73
886	Telangana	Khammam	Peddamunagala	80.2981	17.1675	1.61
887	Telangana	Khammam	Rangam Banjar Malsur Tanda	80.5089	17.1944	1.58
888	Telangana	Khammam	Rebbavaram	80.3369	17.1167	2.48
889	Telangana	Khammam	Remidicherla	80.4979	16.7996	1.78
890	Telangana	Khammam	Thatipudi	80.3375	17.1483	2.27
891	Telangana	Khammam	Thutikuntla	80.2847	17.1056	3.09
892	Telangana	Mahabubnagar	Bandrapal (Banderpalli)	77.7983	16.605	1.8
893	Telangana	Mahabubnagar	Bommaraju Palli	78.4006	16.7783	2.11
894	Telangana	Mahabubnagar	Chowdoor	78.0708	16.9764	1.78
895	Telangana	Mahabubnagar	Dhanwada-Pz	77.6564	16.6411	1.74
896	Telangana	Mahabubnagar	Janampet-Aq-I	77.9894	16.6339	1.52
897	Telangana	Mahabubnagar	Janumpalle	78.2794	16.3005	2.26
898	Telangana	Mahabubnagar	Jawlapur	77.6268	16.5583	1.55
899	Telangana	Mahabubnagar	Jedcherla-Pz	78.1447	16.7475	1.9
900	Telangana	Mahabubnagar	Jellapur-Aq-I	78.6031	16.6592	1.62
901	Telangana	Mahabubnagar	Kalwakurthy- Aq-I	78.4858	16.6742	1.61
902	Telangana	Mahabubnagar	Kandur-Aq-I	77.96	16.5567	2.09
903	Telangana	Mahabubnagar	Kistampalli	77.956	17.0602	2.56
904	Telangana	Mahabubnagar	Kothur EW	77.7055	17.1511	1.68
905	Telangana	Mahabubnagar	Lingala - Aq-I	78.5133	16.295	3.04
906	Telangana	Mahabubnagar	Marchala	78.4551	16.7034	3.4
907	Telangana	Mahabubnagar	Pedda Mudnur - Aq-I	78.3522	16.3897	1.64
908	Telangana	Mahabubnagar	Tarnikal-Aq-Ii	77.96	16.5567	2.8
909	Telangana	Mahabubnagar	Urukonda- Middle	78.4089	16.7281	2.31
910	Telangana	Mahabubnagar	Vangur-Pz	78.6211	16.6131	3.42
911	Telangana	Mahabubnagar	Vatem- Aq-I	78.2158	16.5914	2.15
912	Telangana	Mahabubnagar	Vithayapalli- Aq-I	78.5283	16.8822	2.78
913	Telangana	Mahabubnagar	Yamki EW	77.6008	17.0105	4.31
914	Telangana	Medak	Bodagattu	77.9794	18.0486	1.71
915	Telangana	Medak	Chalki	77.6833	17.9086	2.03
916	Telangana	Medak	Dom mata	78.7181	18.2806	1.56
917	Telangana	Medak	Jharasangam-Pz	77.7103	17.7614	1.81
918	Telangana	Medak	Jinnaram	78.3303	17.6326	1.62
919	Telangana	Medak	Kistapur	78.714	17.9643	2.01
920	Telangana	Medak	Nanganur	79.0461	18.0665	2.24
921	Telangana	Medak	Narsapur	78.2746	17.7524	2.08
922	Telangana	Medak	Nayalkal	77.657	17.8458	6
923	Telangana	Medak	Pz of Aq-I, At-Peddareddypet	77.9572	17.7683	2.03
924	Telangana	Medak	Pz of Aq-I, At-Rollapadu	78.0581	17.8947	1.64
925	Telangana	Medak	Pz of Aq-II, At-Solakapalli	78.2797	17.6442	1.6
926	Telangana	Medak	Rajgopalpet	78.9435	18.0917	1.56
927	Telangana	Medak	Siddipet-Pz	78.8356	18.1058	2.08
928	Telangana	Medak	Thoguta	78.7203	18.0093	2.21
929	Telangana	Medak	Toopran	78.4709	17.8035	1.97
930	Telangana	Nalgonda	Ajilapuram	78.8047	16.9823	1.71
931	Telangana	Nalgonda	Antampet-Pz-I	78.8889	17.0361	4.95

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
932	Telangana	Nalgonda	Antampet-Pz-II	78.8889	17.0361	2.6
933	Telangana	Nalgonda	Chandepalli	79.0936	17.5336	1.54
934	Telangana	Nalgonda	Chennammen Palli	79.0356	19.6375	1.84
935	Telangana	Nalgonda	Chikatguda	79.5211	17.1636	3.98
936	Telangana	Nalgonda	Chikativamidi	79.0244	17.0981	2.1
937	Telangana	Nalgonda	Chinna Raviral	78.7247	17.3831	2.8
938	Telangana	Nalgonda	Gujja -Pz-I	78.9708	17.1375	3.48
939	Telangana	Nalgonda	Gujja -Pz-II	78.9708	17.1375	3.43
940	Telangana	Nalgonda	Hasanabad	78.8831	17.5272	3.75
941	Telangana	Nalgonda	Kandagatla Pz-2	79.6258	17.2675	1.96
942	Telangana	Nalgonda	Kodad-Pz	79.9583	16.9306	1.95
943	Telangana	Nalgonda	Kurumapalli, Aq-I	78.7947	16.8869	2.62
944	Telangana	Nalgonda	Lingarajpalle	79.1297	17.4089	1.82
945	Telangana	Nalgonda	M.Turkapalli- Pz	78.7958	17.6569	1.81
946	Telangana	Nalgonda	Malkapur Aq-Ii	78.8008	17.2764	3.33
947	Telangana	Nalgonda	Malkapuram	78.7961	17.2739	2.35
948	Telangana	Nalgonda	Mallapuram	78.9117	17.6339	2.18
949	Telangana	Nalgonda	Mangapur	79.5389	17.0097	1.96
950	Telangana	Nalgonda	Masangi	78.5053	16.6053	1.8
951	Telangana	Nalgonda	Munipampula	79.1578	17.3231	1.99
952	Telangana	Nalgonda	Nagaram- Aq-I	79.02	17.3569	3.02
953	Telangana	Nalgonda	Ramannapet	79.0953	17.2933	2.06
954	Telangana	Nalgonda	Venkatapuram	78.8664	17.6417	3.28
955	Telangana	Nalgonda	Yerravaram, Aq-I	79.9492	16.89	1.97
956	Telangana	Nizamabad	Gangoppala	78.425	18.6374	1.82
957	Telangana	Nizamabad	Vennel Bashirabad	78.3826	18.8534	2.32
958	Telangana	Ranga Reddy	Bata Singaram	78.7283	17.3029	2.56
959	Telangana	Ranga Reddy	Ghatkesar2	78.6906	17.4539	1.65
960	Telangana	Ranga Reddy	Guntapally	78.7053	17.2878	3.05
961	Telangana	Ranga Reddy	Indur-Pz	77.6133	17.63	3.36
962	Telangana	Ranga Reddy	Karmanghat	78.5248	17.3403	2.47
963	Telangana	Ranga Reddy	Loyapalli	78.8338	17.0424	5.85
964	Telangana	Ranga Reddy	Maheshwaram	78.4367	17.1356	5.89
965	Telangana	Ranga Reddy	Manchal	78.7269	17.3582	2.34
966	Telangana	Ranga Reddy	Marripally	78.61	17.3769	1.83
967	Telangana	Ranga Reddy	Medchal1	78.4754	17.6355	1.73
968	Telangana	Ranga Reddy	Muchinthal	78.3305	17.1656	3.4
969	Telangana	Ranga Reddy	Nacharam	78.55	17.4312	3.4
970	Telangana	Ranga Reddy	Nacharla	77.8504	16.9066	1.9
971	Telangana	Ranga Reddy	Pallepalli	77.8341	17.0729	1.53
972	Telangana	Ranga Reddy	Peddumul	77.6605	17.3391	1.52
973	Telangana	Ranga Reddy	Polkampalli	78.7068	17.2261	2.24
974	Telangana	Ranga Reddy	Rajendranagar1	78.409	17.3334	3.3
975	Telangana	Ranga Reddy	Rapole	77.9521	17.1361	1.53
976	Telangana	Ranga Reddy	Thurakapalli	78.5996	17.669	2.31
977	Telangana	Ranga Reddy	Vanasthalipuram-Pz	78.58	17.3357	1.68
978	Telangana	Warangal	Akulatanda	79.9135	17.986	2.21
979	Telangana	Warangal	Ammavaripeta	79.5572	17.9413	2.67
980	Telangana	Warangal	Ashok Nagar	79.951	17.954	1.86
981	Telangana	Warangal	Ayyagaripalle	79.9851	17.5001	1.52
982	Telangana	Warangal	Beerishettigudem	79.7737	17.4816	1.58
983	Telangana	Warangal	Bontagattu Nagaram	79.2146	17.9733	1.9
984	Telangana	Warangal	Chityal2	79.6797	18.3344	2
985	Telangana	Warangal	Duggondi	79.8063	18.0217	1.71
986	Telangana	Warangal	Edjarla Pz	79.9652	17.4311	1.66
987	Telangana	Warangal	Gudur2	79.9796	17.801	1.98

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
988	Telangana	Warangal	Jhalli	79.8564	17.8433	2.06
989	Telangana	Warangal	Komalla	79.3003	17.7806	1.53
990	Telangana	Warangal	Kothaguda	80.0547	17.9104	2
991	Telangana	Warangal	Kothapalli	79.3047	17.848	1.97
992	Telangana	Warangal	Mutsyala-Pz	78.9933	17.8986	1.67
993	Telangana	Warangal	Narsampet	79.8865	17.9238	2.77
994	Telangana	Warangal	Nellikuduru	79.7544	17.5752	1.71
995	Telangana	Warangal	Panthini	79.6074	17.8493	3.16
996	Telangana	Warangal	Pedda Pendyal	79.4342	17.9078	1.83
997	Telangana	Warangal	Sayampeta-Pz	79.7476	18.1211	2.06
998	Telangana	Warangal	Tadvai-New	80.3128	18.2329	1.61
999	Telangana	Warangal	Thatikonda Pz	79.3025	17.863	1.88
1000	Telangana	Warangal	Theegarajupalli	79.7077	17.8328	2.56
1001	Telangana	Warangal	Urugonda	79.6899	18.0683	1.66
1002	Telangana	Warangal	Vavillala Pz	79.5025	17.62	1.82
1003	Telangana	Warangal	Yellamala	79.1162	17.7033	1.56
1004	Uttar Pradesh	Agra	ETMADPUR	78.18947	27.23328	2.9
1005	Uttar Pradesh	Agra	KHANDAULI	78.02975	27.31166	2.8
1006	Uttar Pradesh	Agra	SAIYAN	77.93848	26.94496	3.3
1007	Uttar Pradesh	Aligarh	Nama	77.94871	27.61766	2.3
1008	Uttar Pradesh	Azamgarh	Palhana	83.0905	25.7846	2
1009	Uttar Pradesh	Farrukhabad	RAJEPUR(Ur)	79.66221	27.48048	2.1
1010	Uttar Pradesh	Fatehpur	MALWAN	80.70697	26.03639	3.8
1011	Uttar Pradesh	Fatehpur	TELIYANI	80.76179	26.00975	2.4
1012	Uttar Pradesh	Fatehpur	Malwan	80.70675	26.0369	3
1013	Uttar Pradesh	Firozabad	TUNDLA	78.24677	27.22549	9
1014	Uttar Pradesh	G.B.Nagar	DANKAUR	77.55594	28.32329	1.7
1015	Uttar Pradesh	G.B. Nagar	Dankaur	77.59387	28.32557	2.5
1016	Uttar Pradesh	Hathras	MURSAN	77.94111	27.56838	1.5
1017	Uttar Pradesh	Hathras	SASNI	78.07405	27.69113	1.5
1018	Uttar Pradesh	J P Nagar	Amroha	78.48583	28.90417	2
1019	Uttar Pradesh	Kanpur Dehat	Akberpur	79.95617	26.3824	1.5
1020	Uttar Pradesh	Lalitpur	Bar	78.58642	24.86269	2.4
1021	Uttar Pradesh	Mainpuri	Katra Saman	79.1982	27.03046	1.6
1022	Uttar Pradesh	Mainpuri	KISHNI(Ur)	79.26638	27.03161	3.2
1023	Uttar Pradesh	Mathura	Ajijpur	77.46436	27.75798	1.7
1024	Uttar Pradesh	Mathura	BALDEO	77.81998	27.41141	7.4
1025	Uttar Pradesh	Mathura	Bhagosa	77.45926	27.52486	2.4
1026	Uttar Pradesh	Mathura	Borpa	77.50702	27.44573	1.5
1027	Uttar Pradesh	Mathura	CHHATA	77.50078	27.72617	3.7
1028	Uttar Pradesh	Mathura	GOVERDHAN	77.47056	27.48276	2.7
1029	Uttar Pradesh	Mathura	Lohaban	77.72932	27.50069	1.9
1030	Uttar Pradesh	Mathura	Puthari	77.31803	27.75416	2.1
1031	Uttar Pradesh	Mathura	RAYA	77.7848	27.54948	1.7
1032	Uttar Pradesh	Mathura	Thok Bindavani	77.90405	27.56969	1.8
1033	Uttar Pradesh	Mathura	Umraya	77.46885	27.67656	3.1
1034	Uttar Pradesh	Pratapgarh	BABA BEKHERNATH	82.1	25.9072	1.8
1035	Uttar Pradesh	Pratapgarh	GAURA	82.1061	25.7457	1.7
1036	Uttar Pradesh	Raibareli	CHHATOH	81.52078	26.15952	3.1
1037	Uttar Pradesh	Raibareli	LALGANJ	80.97911	26.16737	2.6
1038	Uttar Pradesh	Raibareli	ROHNIA	81.39302	25.96403	2.2
1039	Uttar Pradesh	Rampur	Milak	79.16944	28.61167	6
1040	Uttar Pradesh	Rampur	Said Nagar	78.975	28.89389	5
1041	Uttar Pradesh	Rampur	Shahabad	79.01111	28.56306	4
1042	Uttar Pradesh	Rampur	Swar	79.05972	29.03194	3
1043	Uttarakhand	Uttarkashi	Ganganani	78.68	30.9031	2.8

S. No.	State	District	Location	Longitude	Latitude	F > 1.5 mg/L
1044	Uttarakhand	Uttarkashi	Ganganani	78.68	30.9031	2.8
1045	West Bengal	Dakshin Dinajpur	Nayabazar	88.5235	25.3642	5.95
1046	West Bengal	Dakshin Dinajpur	Samjhia	88.7622	25.5174	2.1
1047	West Bengal	Malda	Sripur	88.0449	25.2561	2.2
1048	West Bengal	Murshidabad	Manoharpur	88.0569	23.9775	1.7

Annexure-IV**Locations having Nitrate > 45 mg/litre in Ground Water in Different States/UT of India**

S.No.	State	District	Location	Long	Lat	NO ₃
1	Andhra Pradesh	Anantpur	Alladahalli, EW of Aq-II	77.0444	14.0469	99
2	Andhra Pradesh	Anantpur	Amadguru	78.0233	13.9501	123
3	Andhra Pradesh	Anantpur	Amidala	77.25	14.8417	552
4	Andhra Pradesh	Anantpur	Charupalle	78.0765	14.1953	153
5	Andhra Pradesh	Anantpur	Chauluru-Bh	77.4889	13.7	85
6	Andhra Pradesh	Anantpur	Chinnampalli	77.07	14.48	57
7	Andhra Pradesh	Anantpur	Dharmavaram	77.72	14.4117	54
8	Andhra Pradesh	Anantpur	Gandlaparthy	77.5433	14.58	57
9	Andhra Pradesh	Anantpur	Guntakal - 2	77.3953	15.1672	241
10	Andhra Pradesh	Anantpur	Inagaluru	78.0392	14.0472	316
11	Andhra Pradesh	Anantpur	Ingaluru	78.0389	14.0472	234
12	Andhra Pradesh	Anantpur	Kadiri - Pz	78.1583	14.1083	282
13	Andhra Pradesh	Anantpur	Kalyandurg - Alt	77.11	14.5467	133
14	Andhra Pradesh	Anantpur	Kammavandlapalli	77.8008	14.0047	95
15	Andhra Pradesh	Anantpur	Kanchisamudram	77.6289	13.7878	171
16	Andhra Pradesh	Anantpur	Kodadarakunta	77.3961	14.7342	84
17	Andhra Pradesh	Anantpur	Korthikota	78.3231	13.9342	231
18	Andhra Pradesh	Anantpur	Kothapalem	78.0378	14.3542	86
19	Andhra Pradesh	Anantpur	Madakasira - 1	77.2761	13.9411	96
20	Andhra Pradesh	Anantpur	Madhudi, EW of Aq-II	77.0236	13.8186	131
21	Andhra Pradesh	Anantpur	Manesamudram	77.5308	13.8794	54
22	Andhra Pradesh	Anantpur	Mohammadabad	78.0081	13.9714	327
23	Andhra Pradesh	Anantpur	Mudigubba - Pz	77.9931	14.3403	97
24	Andhra Pradesh	Anantpur	Nagagagubbala	78.0125	14.38	90
25	Andhra Pradesh	Anantpur	Nalla Cheruvu	78.1878	13.9872	674
26	Andhra Pradesh	Anantpur	Penukonda	77.5817	14.0722	295
27	Andhra Pradesh	Anantpur	Rayadurg - New	76.85	14.7	221
28	Andhra Pradesh	Anantpur	Rolla1	77.1	13.8417	47
29	Andhra Pradesh	Anantpur	Sivapuram	77.7272	14.8342	104
30	Andhra Pradesh	Anantpur	Talapula - Pz	78.2625	14.2431	464
31	Andhra Pradesh	Anantpur	Talupula	78.26	14.2436	456
32	Andhra Pradesh	Anantpur	Timmapuram	77.5936	14.114	46
33	Andhra Pradesh	Anantpur	Vajrakarur	77.6762	13.9605	113
34	Andhra Pradesh	Anantpur	Vajrakarur	77.3825	15.0225	174
35	Andhra Pradesh	Anantpur	Valasa Agraharam, EW of Aq-II	76.9044	14.1403	70
36	Andhra Pradesh	Anantpur	VIRUPPALLI	77.14	14.64	52
37	Andhra Pradesh	Anantpur	Yadiki - Pz	77.875	15.05	95
38	Andhra Pradesh	Chittur	Balasamudram	78.4	13.39	63
39	Andhra Pradesh	Chittur	Bangarupalem	78.9086	13.1906	77
40	Andhra Pradesh	Chittur	Chintaparti-1	78.7047	13.6442	92
41	Andhra Pradesh	Chittur	Kalakada	79.1778	13.0417	338
42	Andhra Pradesh	Chittur	Kalakoda	78.7875	13.8275	362
43	Andhra Pradesh	Chittur	Kandukuru	78.1603	13.7608	77
44	Andhra Pradesh	Chittur	Katikapally-PZ	79.2542	13.3108	129
45	Andhra Pradesh	Chittur	Muddu Ramapuram	79.0022	13.1153	85
46	Andhra Pradesh	Chittur	Mungilipattu	79.2494	13.5606	65
47	Andhra Pradesh	Chittur	Palamaneru	78.7428	13.2028	102
48	Andhra Pradesh	Chittur	Piler(Rural)-PZ	78.9503	13.6444	73
49	Andhra Pradesh	Chittur	Srikalahasti	79.7164	13.7658	55

S.No.	State	District	Location	Long	Lat	NO ₃
50	Andhra Pradesh	Chittur	Tirupati(U)	79.4214	13.6422	62
51	Andhra Pradesh	Chittur	Vagalla	78.9058	13.7743	58
52	Andhra Pradesh	Chittur	Valiveedu-PZ	79.0761	13.5272	88
53	Andhra Pradesh	Chittur	Venkatagirikota	78.4781	12.9986	125
54	Andhra Pradesh	East Godavari	Amalapuram	81.9957	16.5622	60
55	Andhra Pradesh	East Godavari	anjaneya nagar	82.2482	17.0095	107
56	Andhra Pradesh	East Godavari	Bhavujipet	81.8467	17.2084	54
57	Andhra Pradesh	East Godavari	Burugupudi-1	82.1017	17.2004	71
58	Andhra Pradesh	East Godavari	Chaviti tibal	81.9854	17.6183	71
59	Andhra Pradesh	East Godavari	Dharmavaram	82.2282	17.2271	236
60	Andhra Pradesh	East Godavari	Fishing horbour	82.2758	16.9851	234
61	Andhra Pradesh	East Godavari	Gontuvanipalem	81.8037	17.0579	124
62	Andhra Pradesh	East Godavari	Kasinadhapuram	82.2306	16.925	179
63	Andhra Pradesh	East Godavari	Kattipudi	82.3314	17.2429	139
64	Andhra Pradesh	East Godavari	Korangi	82.2359	16.8151	74
65	Andhra Pradesh	East Godavari	Lagarai	82.1933	17.5741	77
66	Andhra Pradesh	East Godavari	Peddapuram -2	82.1467	17.0745	93
67	Andhra Pradesh	East Godavari	Rajahmundry-main road	81.8046	17.0584	46
68	Andhra Pradesh	East Godavari	Rajahmundry-swarajyanagar	82.1162	17.355	64
69	Andhra Pradesh	East Godavari	Rampachodavaram	81.7777	17.4388	128
70	Andhra Pradesh	East Godavari	Rowtulapudi	82.3683	17.3761	240
71	Andhra Pradesh	East Godavari	Santhacheruvu	82.2371	16.9504	71
72	Andhra Pradesh	East Godavari	Tallarevu	82.2303	16.7829	125
73	Andhra Pradesh	East Godavari	Uppada	82.3359	17.0807	91
74	Andhra Pradesh	East Godavari	Veerbhadrapuram	82.0748	17.4379	107
75	Andhra Pradesh	East Godavari	vegayamma peta	82.0827	16.7806	56
76	Andhra Pradesh	Guntur	A. Muppalla	79.8415	16.2434	97
77	Andhra Pradesh	Guntur	Amaravati	80.3612	16.5733	130
78	Andhra Pradesh	Guntur	Bellamkonda	80.0076	16.4922	109
79	Andhra Pradesh	Guntur	Bhrahmanpally	79.8279	16.5183	142
80	Andhra Pradesh	Guntur	Brahmanpalli	79.8311	16.5174	177
81	Andhra Pradesh	Guntur	Cheruvu Jammulapalem	80.445	15.9354	135
82	Andhra Pradesh	Guntur	Chilikaluripet-1	80.1765	16.0851	57
83	Andhra Pradesh	Guntur	Durgi	79.5371	16.4234	49
84	Andhra Pradesh	Guntur	Enugupalem	79.8268	16.0206	71
85	Andhra Pradesh	Guntur	Govada	80.667	16.0701	64
86	Andhra Pradesh	Guntur	Gurazala	79.6467	16.5616	85
87	Andhra Pradesh	Guntur	Guttikonda	79.8322	16.4306	114
88	Andhra Pradesh	Guntur	Inovolu	79.6704	15.9932	118
89	Andhra Pradesh	Guntur	Inturu	80.6199	16.0597	140
90	Andhra Pradesh	Guntur	Kattempudi	80.5453	16.0936	79
91	Andhra Pradesh	Guntur	Kollipara	80.7496	16.2866	82
92	Andhra Pradesh	Guntur	Krosur	80.1393	16.5429	55
93	Andhra Pradesh	Guntur	Mandadi	79.4054	16.4084	125
94	Andhra Pradesh	Guntur	Mandhadam	80.5316	16.5145	218
95	Andhra Pradesh	Guntur	Medikondur	80.3023	16.3455	71
96	Andhra Pradesh	Guntur	Murjampadu	79.9084	16.5906	139
97	Andhra Pradesh	Guntur	Nadendla	80.1843	16.1762	211
98	Andhra Pradesh	Guntur	Nallapadu	80.3739	16.3057	152
99	Andhra Pradesh	Guntur	Narakoduru	80.5145	16.2257	136
100	Andhra Pradesh	Guntur	Narakullapadu	80.3663	16.5329	55
101	Andhra Pradesh	Guntur	Nekarikallu2	79.9423	16.3702	50
102	Andhra Pradesh	Guntur	Nijampatnam	80.6722	15.9181	98
103	Andhra Pradesh	Guntur	Pedda Parimi	80.4552	16.4599	172
104	Andhra Pradesh	Guntur	Phanidharam	80.3969	16.3608	1535
105	Andhra Pradesh	Guntur	Pirangipuram	80.2565	16.288	91
106	Andhra Pradesh	Guntur	Pisapadu	80.1431	16.4979	199

S.No.	State	District	Location	Long	Lat	NO ₃
107	Andhra Pradesh	Guntur	Ponnekallu	80.4021	16.4043	175
108	Andhra Pradesh	Guntur	Prattipadu	80.3318	16.1803	575
109	Andhra Pradesh	Guntur	Rentachintala	79.5477	16.5514	62
110	Andhra Pradesh	Guntur	Rentapalle	80.1364	16.4713	68
111	Andhra Pradesh	Guntur	Rompicherla	79.9133	16.21	146
112	Andhra Pradesh	Guntur	Rompicherla Pz	79.9049	16.2128	45
113	Andhra Pradesh	Guntur	Santagudipadu	79.9141	16.2534	241
114	Andhra Pradesh	Guntur	Sattenapalli	80.1479	16.4063	108
115	Andhra Pradesh	Guntur	Satulur	80.1232	16.253	68
116	Andhra Pradesh	Guntur	Sekuru	80.5874	16.2696	63
117	Andhra Pradesh	Guntur	Sirigiripadu-alt	79.3263	16.3043	70
118	Andhra Pradesh	Guntur	Thummalacheruvu	79.7987	16.5255	166
119	Andhra Pradesh	Guntur	Timmapuram	80.2048	16.1491	158
120	Andhra Pradesh	Guntur	Tummurukota	79.4611	16.5583	49
121	Andhra Pradesh	Guntur	Ungutur	80.3645	16.4941	45
122	Andhra Pradesh	Guntur	Utukuru	80.2018	16.566	445
123	Andhra Pradesh	Guntur	Vellatur	79.6506	16.1193	189
124	Andhra Pradesh	Guntur	Vykuntapuram	80.4127	16.566	163
125	Andhra Pradesh	Guntur	Zupudi	80.2572	16.5661	45
126	Andhra Pradesh	Kadapa	Alludupally	78.6769	14.7192	96
127	Andhra Pradesh	Kadapa	Ananta-samudram (OW2 of Aq-II (3rd Well))	79.1697	14.0656	61
128	Andhra Pradesh	Kadapa	Bonala	78.1389	14.525	112
129	Andhra Pradesh	Kadapa	Dhodiyam-PZ	78.22	14.9447	213
130	Andhra Pradesh	Kadapa	Donkapalli Satram	78.1461	14.7314	77
131	Andhra Pradesh	Kadapa	E.Kothapally-PZ	78.1831	14.3989	48
132	Andhra Pradesh	Kadapa	Galiveedu-alt	78.5028	14.0247	171
133	Andhra Pradesh	Kadapa	Giddangivaripally	78.3564	14.3272	45
134	Andhra Pradesh	Kadapa	JANGAMREDDYPALLE	78.1991	14.6786	448
135	Andhra Pradesh	Kadapa	Kanagudur	78.62	14.9072	238
136	Andhra Pradesh	Kadapa	Kodur	79.3528	13.9586	121
137	Andhra Pradesh	Kadapa	Lakkireddipalli	78.6983	14.185	219
138	Andhra Pradesh	Kadapa	Lingale	78.1317	14.4989	50
139	Andhra Pradesh	Kadapa	N.Pallagiri	78.4444	14.4556	649
140	Andhra Pradesh	Kadapa	Talamanchipatnm	78.3117	14.9447	83
141	Andhra Pradesh	Kadapa	Tippyreddy Palle	78.7795	14.8533	75
142	Andhra Pradesh	Kadapa	ULAVAPALLI (Kondur)	78.5267	14.4369	49
143	Andhra Pradesh	Kadapa	Vbmatham	78.8783	14.8203	157
144	Andhra Pradesh	Kadapa	Vempally-PZ	78.4653	14.3731	50
145	Andhra Pradesh	Kadapa	Vishwanathpuram	78.7072	14.7253	61
146	Andhra Pradesh	Kadapa	Yerraguntla-PZ	78.5394	14.6303	93
147	Andhra Pradesh	Krishna	A Konduru-New	80.648	16.9632	308
148	Andhra Pradesh	Krishna	Anukuru	80.8189	16.3921	107
149	Andhra Pradesh	Krishna	Bomminampadu	81.217	16.4736	258
150	Andhra Pradesh	Krishna	Gampalagudem	80.5242	16.9996	119
151	Andhra Pradesh	Krishna	Garikapadu	80.0523	16.951	120
152	Andhra Pradesh	Krishna	Gopalpuram-New	80.6621	17.0229	151
153	Andhra Pradesh	Krishna	Jagannathapuram	80.4099	16.7294	73
154	Andhra Pradesh	Krishna	Kottareddigudem	80.7414	16.8768	59
155	Andhra Pradesh	Krishna	MAKKAPETA	80.1915	16.9251	140
156	Andhra Pradesh	Krishna	Marripalem(Nagayalanka)	80.9222	15.9494	70
157	Andhra Pradesh	Krishna	Munjuluru	81.212	16.3092	50
158	Andhra Pradesh	Krishna	Palevada	81.287	16.5795	49
159	Andhra Pradesh	Krishna	PENUGANCHIPROLU	80.2471	16.9019	159
160	Andhra Pradesh	Krishna	Singarayapalem	81.1517	16.4106	71
161	Andhra Pradesh	Krishna	Tadanki	80.8803	16.0414	48
162	Andhra Pradesh	Krishna	Tiruvur	80.6144	17.1142	83

S.No.	State	District	Location	Long	Lat	NO ₃
163	Andhra Pradesh	Krishna	Upparigudem	81.1741	16.4083	116
164	Andhra Pradesh	Krishna	Veenagadapa	80.0644	16.972	94
165	Andhra Pradesh	Kurnool	Aluru1	77.2422	15.14	91
166	Andhra Pradesh	Kurnool	Banaganapalle	78.3433	15.3506	159
167	Andhra Pradesh	Kurnool	Bapuram	77.0835	15.7886	61
168	Andhra Pradesh	Kurnool	Bapuram1	77.1489	15.3486	97
169	Andhra Pradesh	Kurnool	DODDANAKERE	77.2849	15.6994	255
170	Andhra Pradesh	Kurnool	Erragudi	78.17	15.38	64
171	Andhra Pradesh	Kurnool	Gonegondla	77.5959	15.7115	48
172	Andhra Pradesh	Kurnool	Gulyan	77.0649	15.3608	438
173	Andhra Pradesh	Kurnool	Holagondi	77.0667	15.4967	70
174	Andhra Pradesh	Kurnool	Kodumuru	77.7667	15.6833	315
175	Andhra Pradesh	Kurnool	Kolimigundla	78.1017	15.09	64
176	Andhra Pradesh	Kurnool	Madhavaram	77.3565	15.8993	96
177	Andhra Pradesh	Kurnool	Moravakonda	78.2825	15.9697	177
178	Andhra Pradesh	Kurnool	Naganathanahalli	77.2333	15.5667	145
179	Andhra Pradesh	Kurnool	Nandikotkur	78.275	15.87	59
180	Andhra Pradesh	Kurnool	Orvakallu	78.175	15.6875	68
181	Andhra Pradesh	Kurnool	Podalakunta	77.1208	15.8542	97
182	Andhra Pradesh	Kurnool	Sullavai	77.1156	15.4339	177
183	Andhra Pradesh	Kurnool	Tungabhadra	79.3083	15.9372	280
184	Andhra Pradesh	Nellore	Aduripalli	79.6039	14.4422	239
185	Andhra Pradesh	Nellore	Brahmana Puduru Agraharam	80.0383	13.9306	50
186	Andhra Pradesh	Nellore	Gollapalli	79.5867	13.9503	101
187	Andhra Pradesh	Nellore	Kadanothala	79.9994	14.4575	49
188	Andhra Pradesh	Nellore	Kavali	79.9933	14.8756	52
189	Andhra Pradesh	Nellore	Penubarti	79.7317	14.3817	88
190	Andhra Pradesh	Nellore	Podalakur	79.7317	14.415	143
191	Andhra Pradesh	Nellore	Ramathirdam	80.2403	15.0728	53
192	Andhra Pradesh	Nellore	sangam	79.6717	14.6169	69
193	Andhra Pradesh	Nellore	Sunnapubatti	80.095	14.2897	70
194	Andhra Pradesh	Nellore	Vidyanagar-alt	88.0311	14.0303	49
195	Andhra Pradesh	Prakasham	Addanki -Pz	79.9714	15.8267	46
196	Andhra Pradesh	Prakasham	AGRAHARAM	79.7267	15.5933	343
197	Andhra Pradesh	Prakasham	Ankireddypalle	78.97	15.45	177
198	Andhra Pradesh	Prakasham	Ayyavarepalli	79.6667	15.1472	186
199	Andhra Pradesh	Prakasham	Bestavaripeta	79.0553	15.5144	66
200	Andhra Pradesh	Prakasham	Botla Palem	79.7699	15.7329	51
201	Andhra Pradesh	Prakasham	Chilkapadu	79.9067	15.4783	85
202	Andhra Pradesh	Prakasham	Darsi-new	79.6817	15.7714	74
203	Andhra Pradesh	Prakasham	Dhupadu	79.3669	15.9164	142
204	Andhra Pradesh	Prakasham	Gajjalakonda	79.3956	15.7425	144
205	Andhra Pradesh	Prakasham	Gollapalli	79.3964	15.9267	55
206	Andhra Pradesh	Prakasham	Guttalaumadivrm	79.5581	16.0164	320
207	Andhra Pradesh	Prakasham	Juvvigunta	79.7289	15.4339	165
208	Andhra Pradesh	Prakasham	Kadavakuduru	80.2544	15.7267	174
209	Andhra Pradesh	Prakasham	Kakarla	79.11	15.65	598
210	Andhra Pradesh	Prakasham	Kanigiri	79.3489	15.3933	58
211	Andhra Pradesh	Prakasham	Katurivaripalem	79.6398	15.598	156
212	Andhra Pradesh	Prakasham	Kondivanipalle	79.31	15.73	160
213	Andhra Pradesh	Prakasham	Malakonda	79.6386	15.1167	115
214	Andhra Pradesh	Prakasham	Malepadu	79.7106	15.2397	139
215	Andhra Pradesh	Prakasham	Medarmetla	80.0153	15.7281	264
216	Andhra Pradesh	Prakasham	Neethalapdu	80.3178	15.8867	240
217	Andhra Pradesh	Prakasham	Oneguruvaipalem	79.6461	15.6825	242
218	Andhra Pradesh	Prakasham	P C Palli	79.5744	15.2703	90
219	Andhra Pradesh	Prakasham	P Rallapalle	79.2447	15.3447	48

S.No.	State	District	Location	Long	Lat	NO ₃
220	Andhra Pradesh	Prakasham	P Venkatapuram	79.4762	15.7625	83
221	Andhra Pradesh	Prakasham	Pallamalli	79.9044	15.6496	149
222	Andhra Pradesh	Prakasham	PEDDA ALAVALAPADU	79.6267	15.3272	598
223	Andhra Pradesh	Prakasham	Pernamitta	80	15.53	69
224	Andhra Pradesh	Prakasham	RAMANNAPETA	80.3035	15.7726	51
225	Andhra Pradesh	Prakasham	Ravipadu	79.1519	15.5732	270
226	Andhra Pradesh	Prakasham	Sanikavaram	79.1744	15.9061	54
227	Andhra Pradesh	Prakasham	Santamaguluru Pz	78.1114	14.1269	176
228	Andhra Pradesh	Prakasham	Suryavaripalli (Bedusupalle)	78.9656	15.2758	178
229	Andhra Pradesh	Prakasham	Thokapalle	79.2849	15.8846	214
230	Andhra Pradesh	Prakasham	Turumella	78.9861	15.5228	120
231	Andhra Pradesh	Prakasham	Umamaheswarapuram	79.8265	15.8385	236
232	Andhra Pradesh	Prakasham	Veerabhadrapuram	79.2506	16.0575	46
233	Andhra Pradesh	Prakasham	Vetapalem	80.3178	15.8867	296
234	Andhra Pradesh	Srikakulam	Bejjipuram	83.76	18.23	169
235	Andhra Pradesh	Srikakulam	Heeramandalam	83.9667	18.6667	105
236	Andhra Pradesh	Srikakulam	Kotturu	83.9	18.75	76
237	Andhra Pradesh	Srikakulam	Narasannapeta	84.2722	18.4561	47
238	Andhra Pradesh	Srikakulam	Naupada	84.5475	18.8628	57
239	Andhra Pradesh	Srikakulam	Palakonda	83.7611	18.5944	278
240	Andhra Pradesh	Srikakulam	Palakonda_1	83.7543	18.6027	69
241	Andhra Pradesh	Srikakulam	peddapadu	83.9243	18.3134	180
242	Andhra Pradesh	Srikakulam	Ponduru	83.9856	18.5217	146
243	Andhra Pradesh	Srikakulam	Rajam	84.3072	18.64	85
244	Andhra Pradesh	Srikakulam	Sundarada	84.135	18.7394	48
245	Andhra Pradesh	Srikakulam	Tharli Bodapadu	84.1969	18.6958	88
246	Andhra Pradesh	Srikakulam	Thumarada	83.8636	18.8606	100
247	Andhra Pradesh	Vijayanagram	Almanda village	83.3942	18.1722	124
248	Andhra Pradesh	Vijayanagram	Appayyapet	83.485	18.8283	99
249	Andhra Pradesh	Vijayanagram	Appayyapeta	83.375	18.6833	94
250	Andhra Pradesh	Vijayanagram	Balijipet	83.6514	18.8053	113
251	Andhra Pradesh	Vijayanagram	Bondapalli	83.355	18.3669	76
252	Andhra Pradesh	Vijayanagram	Denkada	83.6711	18.2106	115
253	Andhra Pradesh	Vijayanagram	Gumma	83.6444	18.9542	51
254	Andhra Pradesh	Vijayanagram	Jagaram	83.2256	18.0794	226
255	Andhra Pradesh	Vijayanagram	Kanimetta	83.6669	18.2806	93
256	Andhra Pradesh	Vijayanagram	Kondagandredy	83.4567	18.2836	103
257	Andhra Pradesh	Vijayanagram	Kumaram	83.3517	18.2494	100
258	Andhra Pradesh	Vijayanagram	Lakkavarapu kota	83.1861	18.1625	83
259	Andhra Pradesh	Vijayanagram	Maripivalasa	83.6139	18.7386	139
260	Andhra Pradesh	Vijayanagram	Parvatipuram	83.4228	18.7697	93
261	Andhra Pradesh	Vijayanagram	Payakapadu	83.275	18.645	51
262	Andhra Pradesh	Vijayanagram	Pusapatirega	83.5511	18.0875	107
263	Andhra Pradesh	Vijayanagram	Ramabhadra puram	83.2788	18.4955	63
264	Andhra Pradesh	Vijayanagram	Saluru	83.3286	18.6456	62
265	Andhra Pradesh	Vijayanagram	Tarapuram	83.3117	18.5394	56
266	Andhra Pradesh	Vijayanagram	Vijayanagaram	83.5594	18.1658	59
267	Andhra Pradesh	Visakapatnam	Addaroddu	82.9711	17.6769	55
268	Andhra Pradesh	Visakapatnam	Akkireddipalem PZ	83.3058	17.8208	62
269	Andhra Pradesh	Visakapatnam	Anakapalli	83.0442	17.7442	131
270	Andhra Pradesh	Visakapatnam	Bandavaripalem X road	82.4311	18.0781	154
271	Andhra Pradesh	Visakapatnam	Bheemunipatnam	83.4452	17.9015	81
272	Andhra Pradesh	Visakapatnam	Bhimunipatnam-1	83.4333	17.8833	91
273	Andhra Pradesh	Visakapatnam	Bhimunipatnam-2	83.4842	17.9547	70
274	Andhra Pradesh	Visakapatnam	Kotauratla	82.7381	17.8003	58
275	Andhra Pradesh	Visakapatnam	Kumarapuram	82.9819	17.5478	106
276	Andhra Pradesh	Visakapatnam	Medivoda	82.9731	17.8117	66

S.No.	State	District	Location	Long	Lat	NO ₃
277	Andhra Pradesh	Visakapatnam	Peddabayalu	82.5898	18.2878	49
278	Andhra Pradesh	Visakapatnam	Peddagadili	83.3867	17.9075	80
279	Andhra Pradesh	Visakapatnam	Pudimadaka	83.0403	17.6422	90
280	Andhra Pradesh	Visakapatnam	Sunkarametta	82.9722	18.2722	102
281	Andhra Pradesh	Visakapatnam	Vangali	83.0973	17.8279	85
282	Andhra Pradesh	Visakapatnam	Vontlamamidi	82.7347	18.1011	68
283	Andhra Pradesh	West Godavari	Attili	81.6051	16.6861	61
284	Andhra Pradesh	West Godavari	Buttayagudem	81.3189	17.1988	63
285	Andhra Pradesh	West Godavari	Chityala	81.5984	17.0957	77
286	Andhra Pradesh	West Godavari	Dondapudi	81.5442	17.2098	60
287	Andhra Pradesh	West Godavari	Gopalpuram	81.5483	17.1011	86
288	Andhra Pradesh	West Godavari	Gunjavaram	81.4172	17.2036	73
289	Andhra Pradesh	West Godavari	Jangareddygudem	81.2953	17.1164	62
290	Andhra Pradesh	West Godavari	Kaikaram - PZ 2	81.3642	16.8116	72
291	Andhra Pradesh	West Godavari	Kanapuram	81.4158	17.1836	52
292	Andhra Pradesh	West Godavari	Narsapuram	81.6933	16.4327	61
293	Andhra Pradesh	West Godavari	Polamuru	81.6409	16.6163	98
294	Andhra Pradesh	West Godavari	Undrajavaram	81.6977	16.7904	114
295	Andhra Pradesh	West Godavari	Veeravasaram	81.6306	16.5377	46
296	Bihar	Bhagalpur	Naugachia	87.0875	25.4042	62
297	Bihar	Bhojpur	Sandesh	84.738	25.4057	45
298	Bihar	Bhojpur	Udwantnagar	84.6253	25.5002	233
299	Bihar	Kaimur	Chand	83.3983	25.1142	95
300	Bihar	Rohtas	Bikramganj	84.2628	25.2253	50
301	Bihar	Siwan	Mairwa, Near Petrol pump	84.1502	26.2295	55
302	Chhattisgarh	Balod	Armurkasa	81.078	20.6239	59
303	Chhattisgarh	Balod	chichalgondi	81.2582	20.9543	56
304	Chhattisgarh	Balodabazar	Darchura	81.7903	21.7136	64
305	Chhattisgarh	Balodabazar	Udela	81.85	21.6083	56
306	Chhattisgarh	Balrampur	Bhadar	83.5086	23.3331	56
307	Chhattisgarh	Balrampur	Karji	83.0524	23.215	48
308	Chhattisgarh	Balrampur	Wadrafnagar	83.1958	23.7667	52
309	Chhattisgarh	Bastar	Dahikonga	81.7209	19.4711	62
310	Chhattisgarh	Bastar	Pharasaon	81.6375	19.8583	69
311	Chhattisgarh	Bemetra	Kanhera	81.456	21.8282	56
312	Chhattisgarh	Bilaspur	Khaira	82.1407	22.3624	46
313	Chhattisgarh	Bilaspur	Pandri (Dhanwari Posa)	81.9955	22.9923	74
314	Chhattisgarh	Bilaspur	Piperkhuti	81.8833	22.6639	68
315	Chhattisgarh	Bilaspur	Surada	81.6702	22.0868	63
316	Chhattisgarh	Bilaspur	Udaypur	81.7544	22.2725	49
317	Chhattisgarh	Dhamtari	Mega	81.8005	20.7833	59
318	Chhattisgarh	Durg	Achholi	81.1019	20.5444	53
319	Chhattisgarh	Durg	Bodal	81.4275	21.0317	51
320	Chhattisgarh	Durg	Gatapar	81.2139	21.5667	57
321	Chhattisgarh	Durg	Gunderdehi	81.2958	20.9444	62
322	Chhattisgarh	Durg	Jeora	81.6232	21.6375	56
323	Chhattisgarh	Durg	Jeora-sirsa	81.3064	21.2564	48
324	Chhattisgarh	Durg	Kachandur	81.2969	20.9789	73
325	Chhattisgarh	Durg	Karela	81.4916	20.9411	63
326	Chhattisgarh	Durg	Khurdmudi	81.5343	21.0974	49
327	Chhattisgarh	Durg	Khurmuri.1(new well)	81.6139	21.7125	71
328	Chhattisgarh	Durg	Marra	81.4583	21.0375	57
329	Chhattisgarh	Durg	Motipur	81.5458	21.1667	69
330	Chhattisgarh	Durg	Nahalda	81.0514	20.9333	68
331	Chhattisgarh	Durg	Narratola	81.095	20.5306	69
332	Chhattisgarh	Durg	Selud	81.4194	21.1	51
333	Chhattisgarh	Durg	Sikola	81.5283	21.0444	53

S.No.	State	District	Location	Long	Lat	NO ₃
334	Chhattisgarh	Durg	Zhit	81.5667	21.1292	49
335	Chhattisgarh	Gariyabandh	Baruka	82.0114	20.6931	48
336	Chhattisgarh	Gariyabandh	Fingeshwar	82.0333	20.9667	47
337	Chhattisgarh	Gariyabandh	Kanekera	82.0792	21.0417	47
338	Chhattisgarh	Gariyabandh	Kopra	81.9302	20.8427	60
339	Chhattisgarh	Gariyabandh	Panduka	81.9458	20.775	48
340	Chhattisgarh	Janjgir-Champa	Baloda	82.4778	22.1333	61
341	Chhattisgarh	Janjgir-Champa	Dhardei	82.525	21.7972	60
342	Chhattisgarh	Jashpur	Bagh Bahar	83.7564	22.54	65
343	Chhattisgarh	Jashpur	Bangaon	83.6792	22.6	49
344	Chhattisgarh	Jashpur	Durgapara	83.5236	22.9701	70
345	Chhattisgarh	Jashpur	Jashpurnagar	84.1389	22.8833	55
346	Chhattisgarh	Jashpur	Kotba	83.7403	22.4333	54
347	Chhattisgarh	Jashpur	Kunkuri1	83.9542	22.7419	50
348	Chhattisgarh	Jashpur	Ludeg	83.6042	22.5542	75
349	Chhattisgarh	Jashpur	Pandripani	83.7081	22.9224	53
350	Chhattisgarh	Jashpur	Pathalgaon	83.4625	22.5547	51
351	Chhattisgarh	Jashpur	Rupsera	84.2819	22.95	64
352	Chhattisgarh	Jashpur	Sanna	83.8111	23.0861	76
353	Chhattisgarh	Jashpur	Shabdmunda	83.8349	22.5795	53
354	Chhattisgarh	Jashpur	Tangargaon	83.7324	22.6097	64
355	Chhattisgarh	Jashpur	Tapkara	83.95	22.5042	57
356	Chhattisgarh	Kawardha	Kapada	81.5458	22.2375	66
357	Chhattisgarh	Kawardha	Kui	81.3528	22.3639	48
358	Chhattisgarh	Koriya	kailashpur	82.4765	23.3522	63
359	Chhattisgarh	Koriya	Khadgaon	82.3792	23.1083	73
360	Chhattisgarh	Koriya	Mansukha	82.4917	23.225	67
361	Chhattisgarh	Koriya	podidih	82.0859	23.0264	65
362	Chhattisgarh	Koriya	Pouri	82.4994	23.0386	45
363	Chhattisgarh	Koriya	Sonhat	82.5189	23.4819	59
364	Chhattisgarh	Koriya	Tarabahara	82.1806	23.4111	59
365	Chhattisgarh	Mahasamund	Badesara	83.09	21.3922	66
366	Chhattisgarh	Mahasamund	Jalki	82.2116	21.2433	47
367	Chhattisgarh	Mahasamund	Pasid	82.1457	21.3374	50
368	Chhattisgarh	Raigarh	Amaghat	83.4045	22.0799	68
369	Chhattisgarh	Raigarh	Auranar	83.1628	22.1524	46
370	Chhattisgarh	Raigarh	Bhangari	83.2508	22.1328	48
371	Chhattisgarh	Raigarh	Boro	83.1119	22.5633	54
372	Chhattisgarh	Raigarh	Chaple	83.2	21.9833	65
373	Chhattisgarh	Raigarh	Chiraipani	83.3883	21.9218	72
374	Chhattisgarh	Raigarh	Farkanara	83.1048	22.0142	59
375	Chhattisgarh	Raigarh	Gerwani	83.3751	22.0105	63
376	Chhattisgarh	Raigarh	jamgaon(Basti)	83.534	21.89	59
377	Chhattisgarh	Raigarh	Laripani	83.4708	22.3375	66
378	Chhattisgarh	Raigarh	Mahapalli New	83.4284	21.9001	71
379	Chhattisgarh	Raipur	Biladi	81.7831	21.5728	63
380	Chhattisgarh	Raipur	Chicholi	81.865	21.4658	54
381	Chhattisgarh	Raipur	Chrauda	81.6722	21.38	64
382	Chhattisgarh	Raipur	Devri	81.6833	21.466	66
383	Chhattisgarh	Raipur	Dharsinwa	81.6722	21.4083	68
384	Chhattisgarh	Raipur	Ghivera	81.9752	21.3691	58
385	Chhattisgarh	Raipur	Godhi	81.4545	21.2968	78
386	Chhattisgarh	Raipur	Kanki	81.992	21.4003	47
387	Chhattisgarh	Raipur	Kharora	81.9208	21.3875	49
388	Chhattisgarh	Raipur	Mandirhasud	81.7667	21.2208	47
389	Chhattisgarh	Raipur	Math	81.9026	21.395	54
390	Chhattisgarh	Raipur	Narra	81.8889	21.2639	53

S.No.	State	District	Location	Long	Lat	NO ₃
391	Chhattisgarh	Raipur	Ranisagar	82.0281	21.2783	51
392	Chhattisgarh	Raipur	Semoriya	81.7623	21.3302	51
393	Chhattisgarh	Raipur	Tarpongi	81.6892	21.4906	64
394	Chhattisgarh	Rajnandgaon	Anjora	81.2144	21.1536	69
395	Chhattisgarh	Rajnandgaon	Baghera	81.1231	21.1892	71
396	Chhattisgarh	Rajnandgaon	Bhaistara	81.0296	21.3182	51
397	Chhattisgarh	Rajnandgaon	Chuikhadan	80.9958	21.525	63
398	Chhattisgarh	Rajnandgaon	Dewada	81.1967	21.1458	68
399	Chhattisgarh	Rajnandgaon	Dongargaon.1	80.8569	20.9708	50
400	Chhattisgarh	Rajnandgaon	Dongargarh-d	80.7597	21.1847	53
401	Chhattisgarh	Rajnandgaon	Ghortalab	80.5272	21.1201	60
402	Chhattisgarh	Rajnandgaon	Khairagarh	80.9708	21.4333	70
403	Chhattisgarh	Rajnandgaon	Khursipar	81.3258	21.7483	66
404	Chhattisgarh	Rajnandgaon	Lal bhadurnagar	80.6861	21.1	64
405	Chhattisgarh	Rajnandgaon	Narmada	81.0724	21.6216	62
406	Chhattisgarh	Rajnandgaon	Patharathola	81.0321	21.0916	55
407	Chhattisgarh	Rajnandgaon	Rampur	80.7138	21.0734	66
408	Chhattisgarh	Rajnandgaon	Rangkathera	81.1125	21.3672	65
409	Chhattisgarh	Rajnandgaon	Salgapat	80.9125	21.3167	53
410	Chhattisgarh	Surajpur	Jaynagar	82.9717	23.1847	47
411	Chhattisgarh	Surajpur	Parasrampur	82.7939	23.0833	67
412	Chhattisgarh	Surguja	Pratapgarh	83.4764	22.7333	70
413	Chhattisgarh	Surguja	Rajakatel	83.0417	22.9198	59
414	Chhattisgarh	Surguja	Rajpurikhurd	83.2465	23.1649	61
415	Chhattisgarh	Surguja	Udaipur	82.95	22.9083	53
416	Delhi	Delhi	Asola	77.2667	28.4958	106
417	Delhi	Delhi	Barwala	77.0625	28.7583	100
418	Delhi	Delhi	Daryapur Khurd	76.9086	28.5342	66
419	Delhi	Delhi	Gadaipur Pz	77.1561	28.4769	47
420	Delhi	Delhi	Gazipur Crossing	77.3181	28.6281	122
421	Delhi	Delhi	Gujrat Vihar Pz	77.2917	28.6422	48
422	Delhi	Delhi	Jagatpur Pz 2	77.2225	28.74	55
423	Delhi	Delhi	Jaunapur DJB TW	77.15	28.4681	163
424	Delhi	Delhi	Jaunti DW	76.9667	28.7528	171
425	Delhi	Delhi	Kanjhawala	77	28.725	66
426	Delhi	Delhi	Khera Kalan Pz	77.1181	28.7694	120
427	Delhi	Delhi	Lodhi Garden	77.2164	28.5903	108
428	Delhi	Delhi	Majnu Ka Tila DW	77.2278	28.6958	150
429	Delhi	Delhi	Mangolpur	77.0792	28.6903	60
430	Delhi	Delhi	Nangli Rajapur	77.2733	28.5944	107
431	Delhi	Delhi	Palla Temple	77.2036	28.8225	75
432	Delhi	Delhi	Sanjay Van	77.1419	28.6903	204
433	DNH	Diu	Vanakbara	70.8753	20.7099	125
434	Goa	South Goa	Ella- Old Goa (Icar)	73.9191	15.49779	80
435	Goa	South Goa	Gudemal	74.12976	15.28555	83
436	Goa	South Goa	Kavaselim/Cavellossim	73.9473	15.18571	53
437	Goa	South Goa	Polem(Polen)	74.08455	14.91289	280
438	Gujarat	Ahmedabad	Tagadi1	71.9467	22.2971	70
439	Gujarat	Amreli	Badhda	71.3384	21.2664	85
440	Gujarat	Amreli	Bagasara	70.9608	21.4768	164
441	Gujarat	Amreli	Bhuva	71.3596	21.4277	85
442	Gujarat	Amreli	Boradi	70.927	21.2887	71
443	Gujarat	Amreli	Devaliya	71.2505	21.5277	151
444	Gujarat	Amreli	Goradka	71.4081	21.228	85
445	Gujarat	Amreli	Mandal	71.5793	21.0994	228
446	Gujarat	Amreli	Piyava	71.4602	21.3795	80
447	Gujarat	Amreli	Trakuda	71.2829	21.0165	55

S.No.	State	District	Location	Long	Lat	NO ₃
448	Gujarat	Amreli	Untvad	71.2228	21.9068	110
449	Gujarat	Amreli	Vaghania juna	70.9695	21.5834	51
450	Gujarat	Amreli	Vanot	71.4838	21.1701	48
451	Gujarat	Anand	Adas_DW	73.0352	22.4725	91
452	Gujarat	Anand	Dharmaj	72.7874	22.4207	106
453	Gujarat	Arvali	Bibipur1	73.215	23.254	78
454	Gujarat	Arvali	Boral	73.215	23.1291	76
455	Gujarat	Arvali	Gadada	73.206	23.5952	100
456	Gujarat	Arvali	Hamirpur	73.4606	23.4063	66
457	Gujarat	Arvali	Malpur_1	73.4555	23.3715	64
458	Gujarat	Arvali	Takatuka_1	73.2895	23.8031	72
459	Gujarat	Banaskantha	Gangodra	72.3647	24.4397	63
460	Gujarat	Banaskantha	Meda	72.2853	24.3979	46
461	Gujarat	Banaskantha	Rampura (Vadla)	72.5553	24.2633	70
462	Gujarat	Banaskantha	Ratanpur2	72.7482	24.1784	81
463	Gujarat	Banaskantha	Virampur	72.6523	24.2664	63
464	Gujarat	Bharuch	Kavi	72.6367	22.1954	85
465	Gujarat	Bharuch	Sahol	72.8184	21.4446	53
466	Gujarat	Bhavnagar	Amargadh	71.8678	21.7147	60
467	Gujarat	Bhavnagar	Bora	71.8726	21.1629	69
468	Gujarat	Bhavnagar	Dudhala	71.6511	21.1409	175
469	Gujarat	Bhavnagar	Gariyadhar	71.5636	21.5443	130
470	Gujarat	Bhavnagar	Ghogha	72.2817	21.6803	166
471	Gujarat	Bhavnagar	Kajavadar	71.9733	21.6511	360
472	Gujarat	Bhavnagar	Khari	71.7789	21.2689	151
473	Gujarat	Bhavnagar	Lonjdihara	71.8932	22.0964	75
474	Gujarat	Bhavnagar	Mahuva	71.747	21.1	100
475	Gujarat	Bhavnagar	Panchpipla	71.7249	21.5446	91
476	Gujarat	Bhavnagar	Piparla	71.9189	21.6364	80
477	Gujarat	Bhavnagar	Talaja2	72.0208	21.3657	71
478	Gujarat	Bhavnagar	Timbi2	71.7534	21.8228	79
479	Gujarat	Bhavnagar	Timbi2	71.2021	20.8972	180
480	Gujarat	Bhavnagar	Trapaj	72.0998	21.4244	83
481	Gujarat	Bhavnagar	Vadal	71.8535	21.4474	102
482	Gujarat	Botad	Kundali	71.7	22.2694	92
483	Gujarat	Botad	Rajpada	71.6945	22.3084	300
484	Gujarat	Botad	Senthali	71.7267	22.1683	92
485	Gujarat	Botad	Tatam	71.6333	22.0583	226
486	Gujarat	Chhota Udepur	Panwad	74.0309	22.2102	51
487	Gujarat	Dahod	Dahod Urban-2	74.2557	22.8409	120
488	Gujarat	Dahod	Garada	74.1228	23.1647	115
489	Gujarat	Devbhoomi Dwarka	Asota mota	69.3733	22.2699	48
490	Gujarat	Devbhoomi Dwarka	Bajana	69.756	22.1356	93
491	Gujarat	Devbhoomi Dwarka	Gojines	69.2036	22.0238	45
492	Gujarat	Devbhoomi Dwarka	Gurgadh	69.1909	22.1947	230
493	Gujarat	Devbhoomi Dwarka	Jampar	69.7612	22.0364	47
494	Gujarat	Devbhoomi Dwarka	Kalyanpur	69.0542	22.3076	331
495	Gujarat	Devbhoomi Dwarka	Khakharda	69.3721	22.1048	129
496	Gujarat	Devbhoomi Dwarka	Mota gunda	69.719	22.0115	71
497	Gujarat	Devbhoomi Dwarka	Nawagam	69.7636	21.9767	117
498	Gujarat	Devbhumi Dwarka	Ambardi	69.8583	21.9166	123
499	Gujarat	Devbhumi Dwarka	Aramda	69.035	22.4275	67
500	Gujarat	Devbhumi Dwarka	Dwarka	68.9604	22.2407	55
501	Gujarat	Devbhumi Dwarka	Hanzdapur	69.4368	22.1889	52
502	Gujarat	Devbhumi Dwarka	Khirsara	69.6007	21.9783	61
503	Gujarat	Devbhumi Dwarka	Lambha 1	69.3084	21.9113	47
504	Gujarat	Devbhumi Dwarka	Mojap	68.9796	22.3615	52

S.No.	State	District	Location	Long	Lat	NO ₃
505	Gujarat	Devbhumi Dwarka	Salaya	69.5984	22.3099	56
506	Gujarat	Gir Somnath	Dolasa	70.8472	20.8194	80
507	Gujarat	Gir Somnath	Kansari	71.0553	20.8495	105
508	Gujarat	Gir Somnath	Sametar	71.1207	20.8516	64
509	Gujarat	Gir Somnath	Una2	71.0416	20.8224	46
510	Gujarat	Jamnagar	Bedanpur	70.3125	22.6875	65
511	Gujarat	Jamnagar	Changa	70.0253	22.3401	53
512	Gujarat	Jamnagar	Dhrol2	70.4129	22.5644	55
513	Gujarat	Jamnagar	Hadiyana	70.2659	22.6118	149
514	Gujarat	Jamnagar	Haripur2	70.3411	22.253	53
515	Gujarat	Jamnagar	Jambuda	70.2064	22.5215	71
516	Gujarat	Jamnagar	Moti khavdi	69.8669	22.383	58
517	Gujarat	Jamnagar	Nikava	70.5357	22.1936	138

S.No.	State	District	Location	Long	Lat	NO ₃
518	Gujarat	Jamnagar	Pithad	70.5592	22.689	78
519	Gujarat	Jamnagar	Satapar	69.922	21.8112	61
520	Gujarat	Jamnagar	Seth vadala	70.122	22.0317	120
521	Gujarat	Junagadh	Anandpur	70.5167	21.4072	65
522	Gujarat	Junagadh	Chokli	70.5325	21.6021	70
523	Gujarat	Junagadh	Khokharda	70.3176	21.4201	80
524	Gujarat	Junagadh	Mendarda1	70.4397	21.3336	78
525	Gujarat	Junagadh	Moti Kodyar	70.5289	21.3248	77
526	Gujarat	Junagadh	Prempara	70.7033	21.2983	77
527	Gujarat	Kachchh	Khavda	69.7306	23.8389	54
528	Gujarat	Kachchh	Kuda	70.8086	23.8778	110
529	Gujarat	Kachchh	Ratanpur(maum.)	69.2917	23.1083	60
530	Gujarat	Kachchh	Tera	68.9472	23.2833	72
531	Gujarat	Kheda	Alina	73.0477	22.8057	115
532	Gujarat	Kutchch	Nani Tumbdi	69.5492	22.9961	78
533	Gujarat	Mahesana	Dasaj	72.4465	23.8445	58
534	Gujarat	Mahisagar	Lunawada	73.611	23.1195	52
535	Gujarat	Morbi	Hadmatia	70.8111	22.6822	49
536	Gujarat	Morbi	Halvad2	71.1854	23.0196	102
537	Gujarat	Morbi	Neknam	70.6935	22.509	77
538	Gujarat	Panchmahal	Godhra UR_2	73.6223	22.768	50
539	Gujarat	Panchmahal	Ranipura	73.7442	22.7171	90
540	Gujarat	Panchmahal	Suliyat	73.8595	23.0524	54
541	Gujarat	Patan	Patan2	72.1236	23.8417	52
542	Gujarat	Porbandar	Adwana2	69.5947	21.9154	57
543	Gujarat	Porbandar	Bakharla	69.6364	21.7336	112
544	Gujarat	Porbandar	Bhavpura	69.403	21.8134	97
545	Gujarat	Porbandar	Dhruvala	70.0044	21.694	53
546	Gujarat	Porbandar	Hanumangadh1	69.8024	21.7955	52
547	Gujarat	Porbandar	Khageshri	69.9787	21.7558	66
548	Gujarat	Porbandar	Kolikhada village-2	69.6368	21.6816	67
549	Gujarat	Porbandar	Kutiyana1	70.0113	21.6284	97
550	Gujarat	Porbandar	Mojiwana	69.5743	21.86	52
551	Gujarat	Porbandar	Palkhada1	69.4849	21.7603	105
552	Gujarat	Rajkot	Bhadla	71.0866	22.179	101
553	Gujarat	Rajkot	Dhoraji1	70.4658	21.7635	88
554	Gujarat	Rajkot	Gogavadar	70.88	21.9647	107
555	Gujarat	Rajkot	Halenda	71.0541	22.0876	136
556	Gujarat	Rajkot	Jasapur	70.4881	21.8848	84
557	Gujarat	Rajkot	Jetpur pithad.	70.6408	21.7835	54
558	Gujarat	Rajkot	Kamlapur	71.1999	22.1382	180
559	Gujarat	Rajkot	Khamta	70.6061	22.43	59

S.No.	State	District	Location	Long	Lat	NO3
560	Gujarat	Rajkot	Kolithad1	70.6469	22.0172	81
561	Gujarat	Rajkot	Lodhika1	70.64	22.14	54
562	Gujarat	Rajkot	Mota dadwa	70.9942	21.9981	76
563	Gujarat	Rajkot	Movaiya	70.6275	22.4579	77
564	Gujarat	Rajkot	Ribda	70.7785	22.1267	50
565	Gujarat	Rajkot	Sardhar2	70.9872	22.1355	56
566	Gujarat	Rajkot	Targhari	70.6728	22.3821	64
567	Gujarat	Rajkot	Umrli	70.6023	21.9087	71
568	Gujarat	Rajkot	Viranagar	71.1232	22.0278	54
569	Gujarat	Rajkot	Virpur1	70.6929	21.8466	73
570	Gujarat	Sabarkantha	Boriya	72.9239	23.2671	72
571	Gujarat	Sabarkantha	Chandap_DW	72.8443	23.9228	56
572	Gujarat	Sabarkantha	Gadha1	72.9377	23.6936	66
573	Gujarat	Sabarkantha	Harsol1	73.0156	23.3748	58
574	Gujarat	Sabarkantha	Kesarapura(Mayal)	72.9582	23.3462	81
575	Gujarat	Sabarkantha	Kesharpura	73.1464	23.9055	80
576	Gujarat	Sabarkantha	Khedbramha_1	73.0276	24.0541	85
577	Gujarat	Sabarkantha	Matoda	73.0077	24.1115	60
578	Gujarat	Sabarkantha	Sabalwad	72.9534	23.8709	62
579	Gujarat	Sabarkantha	Silwad	73.1241	24.0128	47
580	Gujarat	Sabarkantha	Wadali	73.0373	23.9169	82
581	Gujarat	Surat	Mandvi	73.3003	21.2574	59
582	Gujarat	Surat	Uchchhal	73.7691	21.1719	47
583	Gujarat	Surendranagar	Bamanbor	71.0373	22.4147	54
584	Gujarat	Surendranagar	Dhajala	71.3978	22.3806	66
585	Gujarat	Surendranagar	Dhama	71.6715	23.3961	51
586	Gujarat	Surendranagar	Gadah	71.4	22.6278	67
587	Gujarat	Surendranagar	Gangad	71.9728	22.9489	513
588	Gujarat	Surendranagar	Kukavati	71.3652	23.0639	56
589	Gujarat	Surendranagar	Malvan	71.7503	23.0614	96
590	Gujarat	Surendranagar	Moti majethi	71.8853	23.0865	164
591	Gujarat	Surendranagar	Moti Moladi	71.104	22.4179	115
592	Gujarat	Surendranagar	Nava Sudamda	71.4358	22.5397	116
593	Gujarat	Surendranagar	Navi Morvad	71.5747	22.5357	74
594	Gujarat	Surendranagar	Parabadi	71.1914	22.2419	132
595	Gujarat	Surendranagar	Pipli	71.7123	23.0687	235
596	Gujarat	Surendranagar	Piprali	71.3117	22.3953	237
597	Gujarat	Surendranagar	Sudamda	71.488	22.446	121
598	Gujarat	Valsad	Mangalwad Fansa	72.7865	20.3448	74
599	Haryana	Bhiwani	Atela	76.106	28.578	95
600	Haryana	Bhiwani	Boond Kalan	76.367	28.781	280
601	Haryana	Bhiwani	Imlota	76.453	28.608	68
602	Haryana	Bhiwani	Isharwal	75.708	28.767	280
603	Haryana	Bhiwani	Lohali	76.046	28.7	424
604	Haryana	Bhiwani	Manheru	76.217	28.703	310
605	Haryana	Bhiwani	Mehrana	76.326	28.555	56
606	Haryana	Bhiwani	Miran	75.742	28.849	443
607	Haryana	Bhiwani	Singhani	75.8	28.533	177
608	Haryana	Bhiwani	Sungarpur	76.094	28.64	45
609	Haryana	Faridabad	Ballabgarh	77.335	28.347	161
610	Haryana	Faridabad	Chhainsa	77.3166	28.3393	60
611	Haryana	Faridabad	Kabulpur	77.439	28.394	108
612	Haryana	Faridabad	Pali	77.244	28.381	307
613	Haryana	Fatehabad	Aharwan	75.542	29.608	99
614	Haryana	Fatehabad	Nahla	75.742	29.438	61
615	Haryana	Fatehabad	Talwara	75.806	29.788	52
616	Haryana	Gurugram	Halley mandi	76.7611	28.345	110

S.No.	State	District	Location	Long	Lat	NO3
617	Haryana	Gurugram	Kasan(Hot spot)1	76.906	28.357	110
618	Haryana	Gurugram	Khorikalan	76.883	28.216	110
619	Haryana	Hisar	Agroha	75.623	29.325	70
620	Haryana	Hisar	Dhansu	75.492	29.278	915
621	Haryana	Jhajjar	Bigoa	76.428	28.657	161
622	Haryana	Jhajjar	Chuchakwas	76.5112	28.598	84
623	Haryana	Jhajjar	Dulhera	76.788	28.646	57
624	Haryana	Jhajjar	Kulasi	76.91	28.774	215
625	Haryana	Jhajjar	Majra Dubhaldhan	76.485	28.6873	114
626	Haryana	Jind	Ghaso Khurd	76.434	29.354	108
627	Haryana	Jind	Khatkaran	76.245	29.403	55
628	Haryana	Kaithal	Kalayath	76.2528	29.6792	117
629	Haryana	Mahendragarh	Buchawas	76.2158	28.2982	110
630	Haryana	Mahendragarh	KaninaKhas	76.308	28.338	100
631	Haryana	Mahendragarh	Narnaul(Hot Spot)	76.1066	28.0501	520
632	Haryana	Mahendragarh	RattaKalan	76.2874	28.1894	110
633	Haryana	Mewat	Gulalta	77.179	27.917	231
634	Haryana	Mewat	Malab	77.011	28.042	109
635	Haryana	Mewat	Nagina	76.983	27.917	127
636	Haryana	Mewat	Sikarwa	77.144	27.954	48
637	Haryana	Palwal	Baghola	77.308	28.221	692
638	Haryana	Palwal	Jaindapur	77.239	28.204	68
639	Haryana	Palwal	Mandkola	77.1801	28.1346	300
640	Haryana	Palwal	Pelak	77.426	28.156	60
641	Haryana	Palwal	Rasulpur	77.3983	28.0867	114
642	Haryana	Palwal	Theraka	77.4331	28.1253	67
643	Haryana	Panchkula	Chandi Mandir	76.861	30.694	48
644	Haryana	Panipat	Lohari	76.839	29.3583	85
645	Haryana	Panipat	Urlana Kalan	76.694	29.344	69
646	Haryana	Rewari	Bahu	76.321	28.453	150
647	Haryana	Rewari	Balawas	76.529	28.104	450
648	Haryana	Rewari	Bawal	76.5794	28.0734	940
649	Haryana	Rewari	Chimnawas	76.4983	28.2143	170
650	Haryana	Rewari	Guriani	76.54	28.356	110
651	Haryana	Rewari	Mandola	76.3621	28.226	90
652	Haryana	Rewari	Nangal Jamalpur	76.335	28.179	110
653	Haryana	Rewari	Sangwari	76.6836	28.1637	67
654	Haryana	Rohtak	Kansla	76.7837	28.892	71
655	Haryana	Rohtak	Kharawar	76.6772	28.8452	89
656	Haryana	Rohtak	Lakhanmajra	76.4776	29.046	86
657	Haryana	Rohtak	Madina	76.4339	28.939	173
658	Haryana	Rohtak	Maham	76.2946	29.964	194
659	Haryana	Rohtak	Nidhana	76.374	29.0114	68
660	Haryana	Sirsa	Dabwali	74.738	29.954	109
661	Haryana	Sirsa	Dariya Wala	74.89	29.616	111
662	Haryana	Sirsa	Mangiana	74.804	29.921	54
663	Haryana	Sirsa	Mithari	74.983	29.85	150
664	Haryana	Sirsa	Sakta Khera	74.636	29.892	144
665	Haryana	Sirsa	Shergarh	74.676	29.926	63
666	Haryana	Sirsa	Taruana	75.008	29.825	54
667	Haryana	Sonipat	Bichpuri	76.6629	29.2024	132
668	Haryana	Sonipat	Bohela	76.854	29.08	397
669	Haryana	Sonipat	Gohana	76.6834	29.1296	61
670	Haryana	Sonipat	Mahara	77.042	28.862	50
671	Haryana	Sonipat	Murthal	77.0846	29.0355	112
672	Haryana	Sonipat	Rai	77.1	28.92	51
673	Haryana	Sonipat	Rasoi	77.11	28.9	72

S.No.	State	District	Location	Long	Lat	NO3
674	Himachal Pradesh	Kangra	Banikhet	76.2153	31.8822	45.3
675	Himachal Pradesh	Kangra	Kheri	75.8697	32.2869	83
676	Himachal Pradesh	Kangra	Loharli	76.1075	32.2231	60
677	Himachal Pradesh	Kangra	Takipur	75.6347	32.1172	130
678	Himachal Pradesh	Kullu	Galore	77.1314	31.9033	90
679	Himachal Pradesh	Solan	Bhalat	76.6083	31.1653	45.1
680	Himachal Pradesh	Solan	Lohara 3 (Daar)	76.76	31.9997	47
681	Himachal Pradesh	Solan	Mao	76.6306	31.0878	45.5
682	Himachal Pradesh	Solan	Tara Garh	76.6119	31.1275	53
683	Himachal Pradesh	Una	Ajjiwala	76.0389	31.7797	78.1
684	Himachal Pradesh	Una	Ishpur	76.0481	31.6706	57.8
685	Himachal Pradesh	Una	Kaned	76.1264	31.5928	45.4
686	J&K	Baramulla	Hadipora	74.3908	34.2914	67
687	J&K	Baramulla	Uplna	74.3975	34.2008	120
688	J&K	Jammu	Allah	74.8367	32.5175	79
689	J&K	Jammu	Gura (Akhnor)	74.708	32.8813	58
690	J&K	Jammu	Hamirpur Sidhar	74.5256	32.7765	168
691	J&K	Jammu	Khairi (Bishnah)	74.9064	32.5853	45
692	J&K	Jammu	Khairi (Raipur)	74.8575	32.8076	45
693	J&K	Jammu	Miran Sahib	74.7947	32.6458	110
694	J&K	Jammu	Sei Khurd	74.7247	32.5075	90
695	J&K	Jammu	Trikuta Nagar	74.88	32.7116	52
696	J&K	Kupwara	Lassipora	74.3831	34.5081	52
697	J&K	Rajouri	Banpari	74.4566	33.0367	51
698	J&K	Rajouri	Ding	74.2763	33.0878	53
699	J&K	Rajouri	Seri	74.2873	33.0833	126
700	J&K	Reasi	Bhamlba	74.5771	33.0519	81
701	J&K	Samba	Channi	74.919	32.626	163
702	J&K	Samba	Daboh	75.105	32.5858	69
703	J&K	Samba	Gho Brahmna	74.9541	32.556	109
704	J&K	Samba	Mothian kalan	75.063	32.623	398
705	J&K	Samba	Nagrota Uttarbani	75.065	32.6239	82
706	J&K	Samba	Nandpur	74.8886	32.5181	69
707	J&K	Samba	Samba	75.1192	32.5575	92
708	J&K	Samba	Sidhra	74.8947	32.7597	61
709	J&K	Srinagar	Bramri	74.2783	34.4661	48
710	J&K	Udhampur	Rakh Badali	75.1089	32.9153	67
711	Jharkhand	Bokaro	Chandra	86.3045	23.5978	87
712	Jharkhand	Dhanbad	Balajee mandir	86.305	23.7975	47
713	Jharkhand	Dhanbad	Basudeopur	86.3684	23.782	81
714	Jharkhand	Dumka	Masalia	87.11	24.09	55.9
715	Jharkhand	Garhwa	Beljampa	83° 52' 20"	24° 12' 40"	51.2
716	Jharkhand	Garhwa	Chiniya	83° 57' 48"	24° 02' 33"	51.8
717	Jharkhand	Garhwa	Dandai	83° 37' 03"	24° 07' 34"	59.8
718	Jharkhand	Garhwa	Godarmana	83° 42' 42"	23° 48' 33"	55.2
719	Jharkhand	Garhwa	Gothani	83° 47' 35"	23° 38' 11"	53.5
720	Jharkhand	Garhwa	Obra	83° 49' 27"	24° 07' 19"	105.1
721	Jharkhand	Garhwa	Ramna	83° 36' 36"	24° 14' 19"	64.3
722	Jharkhand	Garhwa	Ranpura	83° 36' 27"	23° 57' 00"	89.5
723	Jharkhand	Garhwa	Semauna	83° 48' 03"	24° 28' 47"	64.3
724	Jharkhand	Giridih	Bagodar	85.8336	24.084	123.6
725	Jharkhand	Giridih	Dhanaydih	86.1991	24.2264	64.9
726	Jharkhand	Giridih	Dhanwar	85.9792	24.4055	51.1
727	Jharkhand	Giridih	Jamua	86.1512	24.3697	61.5
728	Jharkhand	Giridih	Saraiya	85.8869	24.1738	65.1
729	Jharkhand	Godda	Jaminipaharpur	87.21	25.06	47.3
730	Jharkhand	Gumla	Gumla	84°33'11" E	23°02'39" N	59.9

S.No.	State	District	Location	Long	Lat	NO3
731	Jharkhand	Hazaribagh	Amritnagar	85.4123	23.9938	55
732	Jharkhand	Hazaribagh	Barkagaon	85.2193	23.856	61
733	Jharkhand	Hazaribagh	Bottombazar .	85.3533	23.9945	60
734	Jharkhand	Hazaribagh	College more	85.375	23.9826	60
735	Jharkhand	Hazaribagh	Daru	85.5478	24.0139	54
736	Jharkhand	Hazaribagh	Daru	85.5478	24.0139	56
737	Jharkhand	Hazaribagh	Fasi well	85.3632	23.9935	56
738	Jharkhand	Hazaribagh	Garri Kalan	85.1638	23.8706	59
739	Jharkhand	Hazaribagh	Hazaribagh	85.365	23.9949	54
740	Jharkhand	Hazaribagh	Hazaribagh	85.3675	23.9924	59
741	Jharkhand	Hazaribagh	Keredari	85.0867	23.8604	60
742	Jharkhand	Hazaribagh	Keredari	85.0867	23.8604	60
743	Jharkhand	Hazaribagh	Korrah chawk	85.3851	23.9935	62
744	Jharkhand	Hazaribagh	Kud ashram	85.3419	23.9776	53
745	Jharkhand	Hazaribagh	Kud ashram	85.3419	23.9776	60
746	Jharkhand	Hazaribagh	Masipiri	85.3732	23.9641	58
747	Jharkhand	Hazaribagh	Meru	85.4518	24.0038	60
748	Jharkhand	Hazaribagh	Sendur	85.3828	24.028	58
749	Jharkhand	Hazaribagh	Sendur	85.3828	24.028	60
750	Jharkhand	Hazaribagh	TatiJharia	85.6191	24.0221	60
751	Jharkhand	Hazaribagh	TatiJharia	85.6191	24.0221	61
752	Jharkhand	Hazaribagh	Urimari	85.3096	23.6948	60
753	Jharkhand	Koderma	Buchitar	85.6668	24.4358	90.5
754	Jharkhand	Ramgarh	Gola	85.7169	23.5389	45.5
755	Jharkhand	Ranchi	Bajra	85°16'45" E	23°22'21" N	47.5
756	Jharkhand	Ranchi	Daily Market(Near Thana)	E85019'29"	N23021'57"-	55.7
757	Jharkhand	Ranchi	Itki	85°06'54" E	23°20'26" N	64.1
758	Jharkhand	Ranchi	Sukurhutu	85°17'30" E	23°26'33" N	70.9
759	Jharkhand	Sahibganj	Barhait	87°37'30" E	24°53'20" N	61.7
760	Jharkhand	Saraikela	kandra	86°03'30" E	22°51'30" N	46.2
761	Karnataka	Bagalkot	Algur	76.1075	16.0653	167
762	Karnataka	Bagalkot	Amingarh	75.3297	16.5396	205
763	Karnataka	Bagalkot	Badagandi	75.9406	15.9426	89
764	Karnataka	Bagalkot	Belagalli	75.6466	16.3469	86
765	Karnataka	Bagalkot	Binjawadige	75.7527	16.0466	108
766	Karnataka	Bagalkot	Guledgudda	75.5299	16.376	314
767	Karnataka	Bagalkot	Kerur A	75.1083	16.4764	86
768	Karnataka	Bagalkot	Kodihal	75.9657	15.9617	170
769	Karnataka	Bagalkot	Kumbarhal	75.1518	16.3839	52
770	Karnataka	Bagalkot	Malapura	75.3297	16.572	51
771	Karnataka	Bagalkot	Mudhol	75.9452	16.0553	87
772	Karnataka	Bagalkot	Patadkal	75.2908	16.325	115
773	Karnataka	Bagalkot	Teggi	75.6096	16.2178	56
774	Karnataka	Bagalkot	Tumb	76.2043	16.1026	147
775	Karnataka	Bagalkot	Wadageri	75.277	16.3674	211
776	Karnataka	Ballari	Allipuram I	76.8604	15.1657	139
777	Karnataka	Ballari	Bailuru	76.9129	15.3503	217
778	Karnataka	Ballari	Genikahal	76.8391	15.498	71
779	Karnataka	Ballari	Sirigeri	76.8379	15.4405	225
780	Karnataka	Ballari	Tekalakota(A)	76.8797	15.5361	94
781	Karnataka	Belagavi	Ainapur	74.8936	16.6717	46
782	Karnataka	Belagavi	Badchi	75.1494	16.7372	77
783	Karnataka	Belagavi	Basapur	74.651	16.0607	262
784	Karnataka	Belagavi	Bekud	74.8372	16.4278	108
785	Karnataka	Belagavi	Belakud	74.6537	16.3611	85
786	Karnataka	Belagavi	Eskamba	74.604	16.5287	46

S.No.	State	District	Location	Long	Lat	NO3
787	Karnataka	Belagavi	Gondwad	74.5768	16.192	60
788	Karnataka	Belagavi	Gumachinemaradi	74.6998	16.1	99
789	Karnataka	Belagavi	Hallakki	74.9194	15.9253	81
790	Karnataka	Belagavi	Hanjamhatti	71.5929	16.2825	198
791	Karnataka	Belagavi	Hubruvadi	74.7671	16.4454	127
792	Karnataka	Belagavi	Kabbur	74.7266	16.3495	84
793	Karnataka	Belagavi	Kakmari	75.3002	16.8668	78
794	Karnataka	Belagavi	Khangaon(Alternative)	74.8271	16.015	76
795	Karnataka	Belagavi	Londa	74.492	15.4481	57
796	Karnataka	Belagavi	Mallabad	75.1188	16.8841	91
797	Karnataka	Belagavi	Mamadapur	74.9327	16.1129	85
798	Karnataka	Belagavi	Mangsuli	74.8374	16.7338	82
799	Karnataka	Belagavi	Mole	74.9233	16.7189	45
800	Karnataka	Belagavi	Naganur	74.9138	16.3056	85
801	Karnataka	Belagavi	Nandagaon	75.1284	16.6797	230
802	Karnataka	Belagavi	Naslapur	74.6791	16.5323	74
803	Karnataka	Belagavi	Nesargi	74.7776	15.9058	97
804	Karnataka	Belagavi	Piranwadi	74.4818	15.8023	93
805	Karnataka	Belagavi	Radderhatti	75.0798	16.637	81
806	Karnataka	Belagavi	Rupnal	74.6449	16.5067	235
807	Karnataka	Belagavi	Sangankeri	74.847	16.2382	61
808	Karnataka	Belagavi	Sankeswar	74.4838	16.2606	68
809	Karnataka	Belagavi	Saundatti	75.1137	15.7644	73
810	Karnataka	Belagavi	Sulibhavi	74.6597	15.8947	53
811	Karnataka	Belagavi	Watre	74.4784	15.4802	152
812	Karnataka	Belagavi	Yadgud	74.6048	16.3214	71
813	Karnataka	Belagavi	Yedrav	74.7284	16.5185	51
814	Karnataka	Bengaluru Rural	Avathi	77.7246	13.2953	440
815	Karnataka	Bengaluru Rural	Bairasandra	77.6046	13.2825	415
816	Karnataka	Bengaluru Rural	Devanahalli	77.7122	13.2482	446
817	Karnataka	Bengaluru Rural	Doddaballapura	77.5384	13.2871	372
818	Karnataka	Bengaluru Rural	Gangenpura	77.2122	13.1759	210
819	Karnataka	Bengaluru Rural	Kodagurki	77.7004	13.2999	304
820	Karnataka	Bengaluru Rural	Mahadevapura	77.3218	13.066	186
821	Karnataka	Bengaluru Rural	Siddanaikanahalli	77.5529	13.2983	632
822	Karnataka	Bengaluru Rural	Vishwanathapura	77.6491	13.2714	56
823	Karnataka	Bengaluru Urban	Beguru	77.6169	12.8833	56
824	Karnataka	Bengaluru Urban	Kodigehalli	77.5675	13.0597	73
825	Karnataka	Bidar	Andur	77.4116	17.9132	61
826	Karnataka	Bidar	Danargoan	77.3252	18.2882	62
827	Karnataka	Bidar	Ghatbora	77.0791	17.9054	54
828	Karnataka	Bidar	Handikerewadi	77.142	17.8956	96
829	Karnataka	Bidar	Yerandgi	76.9312	17.7899	166
830	Karnataka	Bijapur	Agasabala Cross	76.1033	16.4792	67
831	Karnataka	Bijapur	Aliabad	75.7891	16.8914	53
832	Karnataka	Bijapur	Ambalanur	76.2469	16.6316	50
833	Karnataka	Bijapur	Bardol	75.7259	17.2782	99
834	Karnataka	Bijapur	Basvan Bagewadi	75.9559	16.5651	67
835	Karnataka	Bijapur	Bavur	76.2517	16.4441	62
836	Karnataka	Bijapur	Bijapur(Alternate)	75.7165	16.8291	60
837	Karnataka	Bijapur	Chadchan	75.6614	17.3113	119
838	Karnataka	Bijapur	Deur Tanda	76.0949	16.78	53
839	Karnataka	Bijapur	Devanagaon	76.3275	17.1634	69
840	Karnataka	Bijapur	Devar Hulagbal	76.244	16.4101	82
841	Karnataka	Bijapur	Dhavalgi(Alternative)	76.1186	16.436	49
842	Karnataka	Bijapur	Hanchali	76.2266	16.6544	89
843	Karnataka	Bijapur	Honaganahalli	75.7337	16.6815	164

S.No.	State	District	Location	Long	Lat	NO3
844	Karnataka	Bijapur	Huvinahippargi	76.0768	16.5562	88
845	Karnataka	Bijapur	Incharagi	75.689	17.1088	114
846	Karnataka	Bijapur	Ingleswar	76.0144	16.6509	48
847	Karnataka	Bijapur	Jagjiwani	75.6719	17.1831	157
848	Karnataka	Bijapur	Jumnal	75.7302	16.7551	148
849	Karnataka	Bijapur	Kannolli	76.149	16.858	88
850	Karnataka	Bijapur	Khatijapur	75.676	16.7651	163
851	Karnataka	Bijapur	Korahalli	76.2263	17.0283	132
852	Karnataka	Bijapur	Mangoli	75.8134	16.6479	147
853	Karnataka	Bijapur	Mileshwara(Alternative)	76.3386	16.4667	91
854	Karnataka	Bijapur	Muddebihal(A)	76.1354	16.3367	64
855	Karnataka	Bijapur	Multagi	75.8864	16.5296	147
856	Karnataka	Bijapur	Nadkurd	75.105	17.1204	80
857	Karnataka	Bijapur	Nagadhana	75.8478	16.9308	105
858	Karnataka	Bijapur	Newdhulikhed	75.8443	17.3918	92
859	Karnataka	Bijapur	Rugi	75.9691	17.0891	60
860	Karnataka	Bijapur	Salotgi	76.0192	17.1366	142
861	Karnataka	Bijapur	Sathihal(Santhal)	76.0572	16.7332	147
862	Karnataka	Bijapur	Sattalgaon	76.0769	17.1435	84
863	Karnataka	Bijapur	Sawalsanga	75.7431	17.1135	163
864	Karnataka	Bijapur	Shivangi	75.984	16.8207	49
865	Karnataka	Bijapur	Tadavallanga	75.9274	17.076	152
866	Karnataka	Bijapur	Telgi	75.8287	16.4787	47
867	Karnataka	Bijapur	Ukkali	75.8809	16.7246	189
868	Karnataka	Bijapur	Vibhutihalli	76.1716	17.0969	115
869	Karnataka	Chamarajanagara	Begur	76.6669	11.9375	83
870	Karnataka	Chamarajanagara	Hanur	77.3006	12.0917	127
871	Karnataka	Chamarajanagara	Maddur (Yelandur)	77.0667	12.0778	60
872	Karnataka	Chamarajanagara	Palanimedu	77.41	12.02	65
873	Karnataka	Chikballapura	Bevinahalli	77.4834	13.4957	72
874	Karnataka	Chikballapura	Chintamani	78.0554	13.4055	732
875	Karnataka	Chikballapura	Gajalahalli	78.0666	13.3154	406
876	Karnataka	Chikballapura	Hampasandra	77.7514	13.743	112
877	Karnataka	Chikballapura	Murugumale	78.1285	13.4413	360
878	Karnataka	Chikballapura	Pura	77.5757	13.5282	271
879	Karnataka	Chikballapura	Upparpet	78.0031	13.4034	372
880	Karnataka	Chitradurga	Arehalli	76.173	14.042	50
881	Karnataka	Chitradurga	Belagur	76.293	13.628	143
882	Karnataka	Chitradurga	Biravara	76.3	14.293	136
883	Karnataka	Chitradurga	Bommanahalli	76.261	14.219	87
884	Karnataka	Chitradurga	Chitradurga	76.399	14.22	65
885	Karnataka	Chitradurga	Doggenal	76.072	14.0203	124
886	Karnataka	Chitradurga	Dummi	76.067	14.029	273
887	Karnataka	Chitradurga	Garaga	76.351	13.629	167
888	Karnataka	Chitradurga	Gutikatte	76.226	13.885	91
889	Karnataka	Chitradurga	Hanumali	76.084	13.999	112
890	Karnataka	Chitradurga	Hartikote	76.649	14.071	198
891	Karnataka	Chitradurga	Hosadurga	76.133	13.862	186
892	Karnataka	Chitradurga	Hosadurga Rs Road	76.133	13.862	149
893	Karnataka	Chitradurga	Kallavana Nagatihalli	76.152	14.177	81
894	Karnataka	Chitradurga	Molakalmuru	76.75	14.716	192
895	Karnataka	Chitradurga	R Nulenur	77.122	14.004	112
896	Karnataka	Chitradurga	Ramagiri	76.121	13.954	186
897	Karnataka	Chitradurga	Siddapura	76.194	14.266	124
898	Karnataka	Chitradurga	Siddavanadurga	76.321	14.325	81
899	Karnataka	Davanagere	Averegere(A)	75.9485	14.4478	51
900	Karnataka	Davanagere	G. Bevinahally	75.7184	14.3744	49

S.No.	State	District	Location	Long	Lat	NO3
901	Karnataka	Davanagere	Lokikere	75.9264	14.3045	55
902	Karnataka	Davanagere	Nallur(A)	75.878	14.0868	85
903	Karnataka	Gulbarga	Alur	76.6318	16.8954	171
904	Karnataka	Gulbarga	Battarga	76.5645	17.4119	157
905	Karnataka	Gulbarga	Belamagi	76.7446	17.6408	110
906	Karnataka	Gulbarga	Chowdapur	76.5496	17.2345	112
907	Karnataka	Gulbarga	Ghattarga	76.4092	17.0929	65
908	Karnataka	Gulbarga	Hasargundi	76.5903	17.1358	164
909	Karnataka	Gulbarga	Kaalgi	77.1525	17.3597	90
910	Karnataka	Gulbarga	Kawalaga K	76.7125	17.1575	96
911	Karnataka	Gulbarga	Kollur	77.4287	17.5329	54
912	Karnataka	Gulbarga	Ladmogili	76.8763	17.6165	49
913	Karnataka	Gulbarga	M. Hippargi	76.3749	17.4591	167
914	Karnataka	Gulbarga	Mallabad	76.4305	17.2318	113
915	Karnataka	Gulbarga	Marthur	76.8836	17.2126	166
916	Karnataka	Gulbarga	Mashal	76.2384	17.3229	153
917	Karnataka	Gulbarga	Ravanur	76.724	17.0034	171
918	Karnataka	Gulbarga	Sona	76.6405	16.9968	59
919	Karnataka	Gulbarga	Wadi	76.9858	17.0437	51
920	Karnataka	Kodagu	Ammatti	75.85	12.23	46
921	Karnataka	Kodagu	Neerkolli	75.75	12.4	46
922	Karnataka	Kodagu	Thayagathoor	75.86	12.33	45
923	Karnataka	Kolar	Arabi Kollanuru	78.042	13.1213	62
924	Karnataka	Kolar	Bairukur	78.489	13.2369	56
925	Karnataka	Kolar	Bevahalli	78.3328	13.2048	55
926	Karnataka	Kolar	Bhimganapalli	78.168	12.843	68
927	Karnataka	Kolar	Budikote	78.12	12.9	190
928	Karnataka	Kolar	Budikunte A	78.12	12.9	403
929	Karnataka	Kolar	Devarayasamundra	78.2983	13.1341	249
930	Karnataka	Kolar	Gadarajahalli	78.3	12.9644	176
931	Karnataka	Kolar	Gudipalli	78.4591	13.2735	145
932	Karnataka	Kolar	Kendatti	78.0366	13.1343	93
933	Karnataka	Kolar	Kurudmale	78.3674	13.2134	173
934	Karnataka	Kolar	Kurugal A	77.9877	13.2042	338
935	Karnataka	Kolar	Mallasandra	78.3527	13.1786	1076
936	Karnataka	Kolar	Mulbagal	78.3895	13.161	330
937	Karnataka	Kolar	Nelam	78.1115	13.1571	142
938	Karnataka	Kolar	Pethandhalli	78.5027	13.246	100
939	Karnataka	Kolar	Tatikallu	78.4736	13.1984	155
940	Karnataka	Kolar	Torlakki	78.068	12.92	542
941	Karnataka	Kolar	Vadegere	78.0966	13.0477	579
942	Karnataka	Koppal	Bandi	76.0583	15.7333	86
943	Karnataka	Koppal	Irkalgada	76.2206	15.4672	174
944	Karnataka	Koppal	Itagi	76.01	15.37	295
945	Karnataka	Koppal	K Hosur	76.26	15.82	134
946	Karnataka	Koppal	Rajoors	75.925	15.5417	316
947	Karnataka	Koppal	Sanganhal	75.98	15.57	225
948	Karnataka	Koppal	Tawargere	76.4167	15.7667	78
949	Karnataka	Mandya	Anchedoddi	77.0772	12.3953	151
950	Karnataka	Mandya	Anjabhuvanahalli	77.12	12.4728	61
951	Karnataka	Mandya	Ankegowdanakoppalu	76.55	12.5167	113
952	Karnataka	Mandya	Arakere1	76.8	12.4167	109
953	Karnataka	Mandya	Bachenahalli	77.0875	12.3328	84
954	Karnataka	Mandya	Basaralu	76.7833	12.7167	105
955	Karnataka	Mandya	Belidegula	76.8667	12.625	58
956	Karnataka	Mandya	Bharati Nagar	77.0333	12.4675	67
957	Karnataka	Mandya	Chapura Doddi	77.0203	12.6222	79

S.No.	State	District	Location	Long	Lat	NO3
958	Karnataka	Mandya	Chikapalya	76.7669	12.4086	148
959	Karnataka	Mandya	Chunchunahalli	76.7381	13.0211	72
960	Karnataka	Mandya	Devegowdana Koppalu	76.6844	12.4975	111
961	Karnataka	Mandya	Kyatanahalli	76.7181	12.8347	132
962	Karnataka	Mandya	Mahadevapura1	76.7667	12.4	47
963	Karnataka	Mandya	Mandya Dw	76.8847	12.5308	49
964	Karnataka	Mandya	Maravanahalli	76.5344	12.6786	102
965	Karnataka	Mandya	Melukote-1	76.6347	12.6556	133
966	Karnataka	Mandya	Mudlu Koppalu	76.7322	12.8347	128
967	Karnataka	Mandya	Nagamangala2	76.7583	12.825	51
968	Karnataka	Mandya	Nelligere	76.8	12.95	70
969	Karnataka	Mandya	Shivanasamudra	77.0997	12.25	60
970	Karnataka	Mandya	Shivapura	77.0531	12.5314	86
971	Karnataka	Mandya	Sreenivasa Agrahara	76.7008	12.4286	50
972	Karnataka	Mysore	Alagudu	76.91	12.2	77
973	Karnataka	Mysore	Alambur	76.73	12.13	81
974	Karnataka	Mysore	Attigod	76.14	12.48	125
975	Karnataka	Mysore	Badakanakoppalu	76.38	12.51	185
976	Karnataka	Mysore	Beeredevanapura	76.52	11.93	54
977	Karnataka	Mysore	Bettadapur	76.1	12.47	213
978	Karnataka	Mysore	Bevinahalli	76.88	12.3	60
979	Karnataka	Mysore	Bheerya	76.34	12.59	64
980	Karnataka	Mysore	Chunchanakatte	76.29	12.5	156
981	Karnataka	Mysore	Devirammanahalli	76.66	12.1	71
982	Karnataka	Mysore	Dhepura	76.07	12.46	158
983	Karnataka	Mysore	Gowdagere	76.33	12.39	81
984	Karnataka	Mysore	Hampapura	76.39	12.49	105
985	Karnataka	Mysore	Hejjodlu	76.37	12.37	143
986	Karnataka	Mysore	Hosaramanahalli	76.41	12.36	78
987	Karnataka	Mysore	Hullahalli	76.55	12.09	76
988	Karnataka	Mysore	Ibjala	76.44	12.11	194
989	Karnataka	Mysore	Kethupura	76.88	12.3	108
990	Karnataka	Mysore	Kittur	76.21	12.49	88
991	Karnataka	Mysore	Koimuthur Colony	76.33	12.25	135
992	Karnataka	Mysore	Konasuru	76.05	12.44	65
993	Karnataka	Mysore	Kothanahalli	76.56	11.92	128
994	Karnataka	Mysore	Mayagowadanahalli	76.24	12.5	88
995	Karnataka	Mysore	Muguru	76.94	12.13	208
996	Karnataka	Mysore	Mullur	76.47	11.98	79
997	Karnataka	Mysore	P. Basavanahalli	76.04	12.41	88
998	Karnataka	Mysore	Punnadahalli Koppalu	76.04	12.38	51
999	Karnataka	Mysore	Ranganathapura	76.82	12.32	62
1000	Karnataka	Mysore	Rathnapuri	76.34	12.23	122
1001	Karnataka	Mysore	Sargur	76.39	11.99	277
1002	Karnataka	Mysore	Shiriyur	76.39	12.38	115
1003	Karnataka	Mysore	Somnathapura	76.88	12.27	96
1004	Karnataka	Mysore	Varuna	76.74	12.26	75
1005	Karnataka	Raichur	Arakeri	76.9508	16.275	89
1006	Karnataka	Raichur	Balatagi	76.95	16.08	60
1007	Karnataka	Raichur	Buddinai	76.7833	16.2	52
1008	Karnataka	Raichur	Chikbhergi	76.5056	15.7583	54
1009	Karnataka	Raichur	Chikkasarur	76.6372	16.1108	47
1010	Karnataka	Raichur	Chincherki	76.7881	16.2011	58
1011	Karnataka	Raichur	Hanchinal	76.6814	15.6722	280
1012	Karnataka	Raichur	Hirekotankal	76.95	15.96	208
1013	Karnataka	Raichur	Jakkaladinni	77.0658	16.1822	76
1014	Karnataka	Raichur	Mahampur	76.4583	15.8389	50

S.No.	State	District	Location	Long	Lat	NO3
1015	Karnataka	Raichur	Maski	76.65	15.96	54
1016	Karnataka	Raichur	Pamankallu	76.67	16.1	49
1017	Karnataka	Raichur	Ulimeshwar	76.4417	15.9519	49
1018	Karnataka	Ramnagara	Aralalu	77.4286	12.5219	50
1019	Karnataka	Ramnagara	Harohalli A	77.475	12.6819	46
1020	Karnataka	Ramnagara	Malagalu	77.1914	12.5783	45
1021	Karnataka	Ramnagara	Naikanahalli	77.3616	12.4209	63
1022	Karnataka	Ramnagara	Sugganahalli	77.3192	12.7994	187
1023	Karnataka	Shivmoga	Arekoppa	75.4217	14.1844	46
1024	Karnataka	Shivmoga	Ayanur	75.4342	14.0111	45
1025	Karnataka	Shivmoga	Gartikere	75.2375	13.8903	60
1026	Karnataka	Tumkur	Gubbi	76.947	13.306	84
1027	Karnataka	Tumkur	Huliyar	76.547	13.584	64
1028	Karnataka	Tumkur	Irkasandra	76.944	13.413	55
1029	Karnataka	Tumkur	Karavadikodi	76.55	13.166	219
1030	Karnataka	Tumkur	Mattigatta	76.481	13.469	47
1031	Karnataka	Tumkur	Medihalli	76.528	13.395	69
1032	Karnataka	Tumkur	Suragondanahalli	76.432	13.405	65
1033	Karnataka	Tumkur	Tiptur (New Well)	76.479	13.259	198
1034	Karnataka	Tumkur	Turuvekere	76.661	13.163	51
1035	Karnataka	Udupi	Kollur	74.8125	13.8658	50
1036	Karnataka	Udupi	Kundapura	74.6903	13.0508	53
1037	Karnataka	Uttara Kannada	Sadashivgad	74.1292	14.8542	47
1038	Karnataka	Vijayanagara	76 Venkatapura	76.5157	15.3303	144
1039	Karnataka	Vijayanagara	Ananthanahalli	75.9479	14.7648	102
1040	Karnataka	Vijayanagara	D.Mallapura	75.9985	14.7773	86
1041	Karnataka	Vijayanagara	Danapura	76.3678	15.1741	120
1042	Karnataka	Vijayanagara	Harkanalu	75.8431	14.8476	168
1043	Karnataka	Vijayanagara	Harpanahalli(Alternative)	75.9804	14.7927	83
1044	Karnataka	Vijayanagara	Kamalapuram(A)	76.4779	15.3072	143
1045	Karnataka	Vijayanagara	Magala	75.7955	14.9941	217
1046	Karnataka	Vijayanagara	Sandur (Alternate Well)	76.5479	15.0855	78
1047	Karnataka	Vijayanagara	Yeshwanthnagar	76.4932	15.0432	217
1048	Karnataka	Yadgir	Hunsagi	76.5202	16.4583	146
1049	Karnataka	Yadgir	Khembhavi	76.5326	16.6483	588
1050	Karnataka	Yadgir	Managinahal	77.037	16.7172	213
1051	Karnataka	Yadgir	Shahpur	76.7557	16.5261	56
1052	Karnataka	Yadgir	Ukkinal	76.6641	16.756	276
1053	Kerala	Alappuzha	Pallarimangalam	76.54	9.2	125
1054	Kerala	Ernakulam	Koothattukulam	76.575	9.8667	104
1055	Kerala	Idukki	Erattayar	77.1048	9.7978	56
1056	Kerala	Idukki	Kattappana	77.1163	9.755	93

S.No.	State	District	Location	Long	Lat	NO3
1057	Kerala	Idukki	Koilkadavu	77.17	10.24	55
1058	Kerala	Idukki	Kulamavu	76.8926	9.7934	51
1059	Kerala	Kannur	Koothuparamba	75.5649	11.8279	70
1060	Kerala	Kannur	Sreekandapuram	75.5085	12.0452	83
1061	Kerala	Kasargode	Bekal	75.0311	12.4004	46
1062	Kerala	Kollam	Kudavettur	76.75	8.9403	63
1063	Kerala	Kottayam	Paipad	76.575	9.4278	65
1064	Kerala	Malappuram	Chungathara1	76.2756	11.3337	52
1065	Kerala	Malappuram	Kottakkal	75.9833	10.9708	52
1066	Kerala	Malappuram	Mangalam	75.9223	10.849	62
1067	Kerala	Malappuram	Manjeri	76.1201	11.1201	66
1068	Kerala	Palakkad	Gopalapuram	76.87	10.6933	88
1069	Kerala	Palakkad	Kalladikkode	76.5389	10.8939	48

S.No.	State	District	Location	Long	Lat	NO3
1070	Kerala	Pathanamthitta	Enathu	76.75	9.08	92
1071	Kerala	Thrissur	Kecheri	76.1617	10.6069	69
1072	Kerala	Thrissur	Perinjalam	76.1476	10.3146	158
1073	Kerala	Trivandrum	Kattakkada	77.08	8.51	78
1074	Kerala	Trivandrum	Pangode	76.9694	8.7653	55
1075	Kerala	Trivandrum	Poovar- II	77.07	8.32	86
1076	Madhya Pradesh	Agar Malwa	AMLA	76.104	23.853	60
1077	Madhya Pradesh	Agar Malwa	GURADI BANGLA	76.155	24.08	77
1078	Madhya Pradesh	Agar Malwa	SOYAT	76.174	24.188	200
1079	Madhya Pradesh	Alirajpur	BHABRA NEW	74.3194	22.5486	62
1080	Madhya Pradesh	Alirajpur	KHUSALBAHEDI	74.5258	22.5519	102
1081	Madhya Pradesh	Alirajpur	NANPUR	74.532	22.271	102
1082	Madhya Pradesh	Anupur	DEOHARA	81.5972	23.1431	45
1083	Madhya Pradesh	Ashok Nagar	BAHADURPUR	77.969	24.342	54
1084	Madhya Pradesh	Ashok Nagar	CHANDERI	78.136	24.712	72
1085	Madhya Pradesh	Ashok Nagar	MUNGAOLI	78.109	24.403	75
1086	Madhya Pradesh	Balaghat	AMAI	79.952	21.676	47
1087	Madhya Pradesh	Balaghat	BAIHAR1	80.551	22.104	68
1088	Madhya Pradesh	Balaghat	DAMOH2	80.795	21.896	47
1089	Madhya Pradesh	Balaghat	KHURMUNDI	80.481	22.125	55
1090	Madhya Pradesh	Balaghat	MIRAGPUR	79.839	21.631	103
1091	Madhya Pradesh	Balaghat	NEWARGAON	80.046	21.811	90
1092	Madhya Pradesh	Balaghat	RAJEGAON	80.25	21.631	64
1093	Madhya Pradesh	Barwani	BALSAMUND	75.175	21.809	122
1094	Madhya Pradesh	Barwani	BARUPHATAK	75.303	21.981	224
1095	Madhya Pradesh	Barwani	BORLAI	75.002	22.039	130
1096	Madhya Pradesh	Barwani	CHOUKI	74.6614	21.888	66
1097	Madhya Pradesh	Barwani	JOGANWADA	75.0438	21.7399	65
1098	Madhya Pradesh	Barwani	JULWANIA	75.185	21.871	132
1099	Madhya Pradesh	Barwani	MORTALAI	74.6243	21.7107	111
1100	Madhya Pradesh	Barwani	NIWALI1	74.923	21.683	86
1101	Madhya Pradesh	Barwani	OSADA	74.8025	21.9695	102
1102	Madhya Pradesh	Barwani	PANSEMAL	74.7122	21.6683	125
1103	Madhya Pradesh	Barwani	RAJPUR	75.136	21.936	77
1104	Madhya Pradesh	Barwani	SENDHWA	75.103	21.694	92
1105	Madhya Pradesh	Barwani	TALWADA DEB	75.1835	22.0683	56
1106	Madhya Pradesh	Betul	ATHNER1	77.921	21.621	45
1107	Madhya Pradesh	Betul	BETUL1	77.927	21.86	120
1108	Madhya Pradesh	Betul	GHATPIPARIA	78.519	21.882	148
1109	Madhya Pradesh	Betul	GUJARMAAL	77.946	21.63	49
1110	Madhya Pradesh	Betul	JHALLAR	77.743	21.726	202
1111	Madhya Pradesh	Betul	JOGLI	77.701	21.975	58
1112	Madhya Pradesh	Bhind	BALAJI	78.98	26.296	62
1113	Madhya Pradesh	Bhind	CHIROLE	78.634	26.355	151
1114	Madhya Pradesh	Bhind	LAHAR	78.947	26.186	110
1115	Madhya Pradesh	Bhind	LAVAN	78.731	26.521	106
1116	Madhya Pradesh	Bhind	NAHRAKAPURA	78.942	26.637	47
1117	Madhya Pradesh	Bhind	PHUPH	78.879	26.643	102
1118	Madhya Pradesh	Bhopal	ISLAMNAGAR	77.418	23.356	50
1119	Madhya Pradesh	Bhopal	SARVAR	77.3	23.156	48
1120	Madhya Pradesh	Burhanpur	BURHANPURDW	76.2231	21.2989	66
1121	Madhya Pradesh	Burhanpur	DEDTALAI	76.7583	21.5092	106
1122	Madhya Pradesh	Burhanpur	KARKHEDA	76.4867	21.3369	94
1123	Madhya Pradesh	Burhanpur	MANJROD KALAN	76.628	21.413	149
1124	Madhya Pradesh	Burhanpur	NACHANKHEDA	76.15	21.2317	137
1125	Madhya Pradesh	Burhanpur	PIPALPANI	76.6792	21.43	107
1126	Madhya Pradesh	Chhatarpur	BIJAWAR	79.4981	24.6503	54

S.No.	State	District	Location	Long	Lat	NO3
1127	Madhya Pradesh	Chhatarpur	CHHATARPUR	79.5911	24.9	53
1128	Madhya Pradesh	Chhatarpur	ISSANAGAR	79.3847	24.8619	55
1129	Madhya Pradesh	Chhatarpur	KURRI	79.72	24.8681	55
1130	Madhya Pradesh	Chhatarpur	NOWGAON	79.45	25.0542	55
1131	Madhya Pradesh	Chhatarpur	PIPORA KHURD	79.4808	24.85	108
1132	Madhya Pradesh	Chhatarpur	SENDPA	79.2528	24.5469	83
1133	Madhya Pradesh	Chhindwara	CHAURAI1	79.251	22.054	45
1134	Madhya Pradesh	Chhindwara	CHHINDI	78.824	22.388	62
1135	Madhya Pradesh	Chhindwara	CHINCHKHEDA	78.479	21.64	53
1136	Madhya Pradesh	Chhindwara	DELA KHARI	78.618	22.421	67
1137	Madhya Pradesh	Chhindwara	GONI	79.013	21.821	59
1138	Madhya Pradesh	Chhindwara	LAHGUDNA	78.724	22.272	87
1139	Madhya Pradesh	Chhindwara	LINGA RLY.STN.	78.938	21.963	116
1140	Madhya Pradesh	Chhindwara	MOHI	78.441	21.658	64
1141	Madhya Pradesh	Chhindwara	PANDURNA	78.518	21.589	190
1142	Madhya Pradesh	Chhindwara	PIPLANARAYANWAR	78.7335	21.5919	87
1143	Madhya Pradesh	Chhindwara	RAMAKONA NEW	78.843	21.702	143
1144	Madhya Pradesh	Chhindwara	RAMGARH	79.272	22.175	53
1145	Madhya Pradesh	Chhindwara	SAONRI1	78.77	21.965	78
1146	Madhya Pradesh	Chhindwara	SARANGBHERI	78.953	21.867	49
1147	Madhya Pradesh	Chhindwara	SILWANIGHATI	78.831	21.788	135
1148	Madhya Pradesh	Chhindwara	SINGHORI	79.062	22.201	52
1149	Madhya Pradesh	Chhindwara	SURLA	79.172	22.433	88
1150	Madhya Pradesh	Chhindwara	TANSARA MAL	78.898	21.862	192
1151	Madhya Pradesh	Damoh	ABHANA	79.537	23.705	126
1152	Madhya Pradesh	Damoh	BAMHORI	79.719	23.685	57
1153	Madhya Pradesh	Damoh	BANGAON NEW	79.517	24.007	259
1154	Madhya Pradesh	Damoh	KHAMARIA	79.559	23.65	60
1155	Madhya Pradesh	Damoh	PALAR	79.469	23.929	86
1156	Madhya Pradesh	Damoh	PATERA2	79.689	23.997	178
1157	Madhya Pradesh	Damoh	SAMNAPUR	79.386	23.313	106
1158	Madhya Pradesh	Dewas	BHESUNI	75.993	23.233	50
1159	Madhya Pradesh	Dewas	BHONRASA	76.207	22.988	55
1160	Madhya Pradesh	Dewas	DEWAS	76.068	22.974	81
1161	Madhya Pradesh	Dewas	KANNOD	76.751	22.664	49
1162	Madhya Pradesh	Dewas	KARNAWAD	76.229	22.73	53
1163	Madhya Pradesh	Dewas	NEVRI	76.25	22.858	78
1164	Madhya Pradesh	Dewas	PIPRI	76.278	22.399	60
1165	Madhya Pradesh	Dewas	SATWAS NEW	76.682	22.534	57
1166	Madhya Pradesh	Dewas	TONK KALAN	76.1458	23.1168	55
1167	Madhya Pradesh	Dewas	UDAINAGARDW	76.204	22.538	66
1168	Madhya Pradesh	Dhar	DHAMNOD	75.473	22.214	47
1169	Madhya Pradesh	Dhar	PIPALYA	74.875	22.134	115
1170	Madhya Pradesh	Dhar	RAJOD	75.067	22.954	82
1171	Madhya Pradesh	Dhar	SINGHANA	74.969	22.188	59
1172	Madhya Pradesh	Dhar	TANDA	74.855	22.505	74
1173	Madhya Pradesh	Dhar	ZEERABAD	75.07	22.398	80
1174	Madhya Pradesh	Gwalior	AARAULI	78.455	26.16	111
1175	Madhya Pradesh	Gwalior	ARON	77.931	25.952	129
1176	Madhya Pradesh	Gwalior	BEHAT	78.543	26.174	127
1177	Madhya Pradesh	Gwalior	CHARAI SHYAMPUR	77.831	25.975	153
1178	Madhya Pradesh	Gwalior	DONGARPUR	77.964	25.822	253
1179	Madhya Pradesh	Gwalior	HARSIBANDH	77.929	25.762	80
1180	Madhya Pradesh	Gwalior	JAHANGIRPUR	78.2906	26.2756	109
1181	Madhya Pradesh	Gwalior	KARIYAWATI	78.18	25.819	56
1182	Madhya Pradesh	Gwalior	PADAMPUR KHERIA	78.2687	26.2665	62
1183	Madhya Pradesh	Harda	CHHIPAWADDW	76.877	22.155	64

S.No.	State	District	Location	Long	Lat	NO3
1184	Madhya Pradesh	Harda	HARDADW	77.088	22.346	137
1185	Madhya Pradesh	Harda	MANDLA	76.947	22.219	48
1186	Madhya Pradesh	Harda	MOHANPUR1	77.23	22.255	53
1187	Madhya Pradesh	Harda	MORGARHIDW	76.944	22.008	131
1188	Madhya Pradesh	Harda	SONPURA COLONY	76.916	22.078	47
1189	Madhya Pradesh	Harda	TEMAGAON	77.321	22.298	177
1190	Madhya Pradesh	Harda	TIMARNI	77.223	22.374	65
1191	Madhya Pradesh	Hoshangabad	PATHRAUTADW	77.796	22.576	117
1192	Madhya Pradesh	Hoshangabad	SEMRI HARCHAND	78.092	22.689	59
1193	Madhya Pradesh	Indore	RANGWASA	75.57	22.744	82
1194	Madhya Pradesh	Indore	SANWER	75.828	22.971	77
1195	Madhya Pradesh	Indore	USHAPURA	75.674	22.809	114
1196	Madhya Pradesh	Jabalpur	GHUGHARA	80.369	23.282	62
1197	Madhya Pradesh	Jabalpur	GOKALPUR	79.985	23.19	46
1198	Madhya Pradesh	Jabalpur	KUNDAM	80.346	23.219	51
1199	Madhya Pradesh	Jabalpur	SALIWADA	79.991	23.107	168
1200	Madhya Pradesh	Jhabua	CHAPARI	74.6797	22.7774	47
1201	Madhya Pradesh	Jhabua	JHABUA1	74.59	22.771	66
1202	Madhya Pradesh	Jhabua	PITOL	74.466	22.785	74
1203	Madhya Pradesh	Jhabua	TIKADIMOTI	74.542	22.694	57
1204	Madhya Pradesh	Katni	BADWARA	80.5769	23.7486	67
1205	Madhya Pradesh	Katni	BARHI	80.811	23.902	49
1206	Madhya Pradesh	Katni	PIPARIA2	80.6986	23.8619	50
1207	Madhya Pradesh	Katni	UMARIAPAN	80.2917	23.5217	79
1208	Madhya Pradesh	Khandwa	BALWARA1	76.516	21.7	50
1209	Madhya Pradesh	Khandwa	BORI SARAY	76.817	22.006	83
1210	Madhya Pradesh	Khandwa	CHANERA	76.698	21.962	68
1211	Madhya Pradesh	Khandwa	DAULATPUR	76.391	22.232	57
1212	Madhya Pradesh	Khandwa	DHANGAON	76.118	22.088	147
1213	Madhya Pradesh	Khandwa	GURHI	76.574	21.639	127
1214	Madhya Pradesh	Khandwa	JASWADI1	76.428	21.794	49
1215	Madhya Pradesh	Khandwa	JAWAR	76.448	21.93	45
1216	Madhya Pradesh	Khandwa	KHALWA1	76.746	21.805	83
1217	Madhya Pradesh	Khandwa	KUSUMBIA	76.175	21.671	62
1218	Madhya Pradesh	Khandwa	PANDHANA	76.227	21.699	104
1219	Madhya Pradesh	Khandwa	RUDHY BHATA	76.467	21.833	60
1220	Madhya Pradesh	Khandwa	THAPANA	76.087	22.222	52
1221	Madhya Pradesh	Khandwa	UDAIPUR	76.403	22.226	176
1222	Madhya Pradesh	Khargone	AMBA	75.946	22.043	166
1223	Madhya Pradesh	Khargone	BADDIYA	75.948	22.234	219
1224	Madhya Pradesh	Khargone	BAMNALA NEW	75.853	21.825	69
1225	Madhya Pradesh	Khargone	BHIKANGAON1	75.956	21.862	135
1226	Madhya Pradesh	Khargone	BHULWANI	75.481	21.548	54
1227	Madhya Pradesh	Khargone	DAUDWA	76.137	22.021	71
1228	Madhya Pradesh	Khargone	DHARGAON	75.597	22.209	136
1229	Madhya Pradesh	Khargone	DHULKOT	75.553	21.61	54
1230	Madhya Pradesh	Khargone	GOGAON	75.7444	21.9181	87
1231	Madhya Pradesh	Khargone	KASRAWAD1	75.608	22.124	100
1232	Madhya Pradesh	Khargone	KHARGONE	75.6194	21.8278	66
1233	Madhya Pradesh	Khargone	PIPLYABUZRUG	75.861	22.234	48
1234	Madhya Pradesh	Khargone	SANAWAD NEW	76.071	22.173	46
1235	Madhya Pradesh	Khargone	SAWDA	75.629	22.031	142
1236	Madhya Pradesh	Khargone	ZIRANNIYA	75.9876	21.6506	62
1237	Madhya Pradesh	Mandla	DITHORI	80.199	22.519	53
1238	Madhya Pradesh	Mandla	KALPI	80.197	22.919	46
1239	Madhya Pradesh	Mandla	MAHANIA PATPARA	80.477	22.685	88
1240	Madhya Pradesh	Mandla	MOTINALA	80.903	22.345	48

S.No.	State	District	Location	Long	Lat	NO3
1241	Madhya Pradesh	Mandsaur	BABULDA	75.688	24.474	87
1242	Madhya Pradesh	Mandsaur	DALODA1	75.0989	23.925	60
1243	Madhya Pradesh	Mandsaur	MANPURA	75.026	23.884	188
1244	Madhya Pradesh	Mandsaur	NAYAKHERA	75.083	24.014	143
1245	Madhya Pradesh	Mandsaur	PIPALIYA	75.008	24.196	63
1246	Madhya Pradesh	Mandsaur	SHAMGARH1	75.64	24.191	84
1247	Madhya Pradesh	Morena	TONGA GAON	77.4381	26.2553	72
1248	Madhya Pradesh	Narsinghpur	BETLI	79.03	23.0833	51
1249	Madhya Pradesh	Narsinghpur	JHOTESHWAR	79.5583	22.9478	48
1250	Madhya Pradesh	Narsinghpur	KARELI BASTI	79.068	22.911	83
1251	Madhya Pradesh	Narsinghpur	KOUDIYA	78.816	22.946	48
1252	Madhya Pradesh	Narsinghpur	SUNDERNAGAR	79.2344	22.8383	64
1253	Madhya Pradesh	Panna	AJAIGARH	80.2675	24.9903	109
1254	Madhya Pradesh	Panna	POWAI	80.1653	24.2647	50
1255	Madhya Pradesh	Raisen	DEHGAON	78.091	23.319	57
1256	Madhya Pradesh	Raisen	GARHI	78.142	23.394	48
1257	Madhya Pradesh	Raisen	PALOKHA	78.296	23.532	51
1258	Madhya Pradesh	Raisen	SULTANGANJ	78.555	23.503	50
1259	Madhya Pradesh	Rajgarh	CHHAPIHERA	76.453	23.897	50
1260	Madhya Pradesh	Rajgarh	GANAYARI	77.008	23.691	190
1261	Madhya Pradesh	Rajgarh	GANDHIGRAM	77.069	23.674	61
1262	Madhya Pradesh	Rajgarh	KHILCHIPUR	76.579	24.043	66
1263	Madhya Pradesh	Rajgarh	PACHOR	76.738	23.718	149
1264	Madhya Pradesh	Rajgarh	UDHANKHERI	76.629	23.664	53
1265	Madhya Pradesh	Ratlam	DHAMNOD	74.978	23.44	97
1266	Madhya Pradesh	Ratlam	UKEDIYA	75.18	23.585	57
1267	Madhya Pradesh	Rewa	NAIGARHI 1	81.775	24.787	48
1268	Madhya Pradesh	Rewa	PAHADI	81.886	24.75	57
1269	Madhya Pradesh	Rewa	SEMARIA2	81.152	24.796	137
1270	Madhya Pradesh	Sagar	REHLI	79.065	23.641	52
1271	Madhya Pradesh	Satna	JHUKHEI	80.426	24.004	47
1272	Madhya Pradesh	Satna	PATWARA	80.621	24.553	47
1273	Madhya Pradesh	Sehore	ASHTA	76.716	23.023	66
1274	Madhya Pradesh	Sehore	BAYAN	77.556	22.734	47
1275	Madhya Pradesh	Sehore	BHANDELI	77.261	23.124	55
1276	Madhya Pradesh	Sehore	BUDHNI	77.683	22.791	92
1277	Madhya Pradesh	Sehore	ICHHAWAR	77.019	23.032	57
1278	Madhya Pradesh	Sehore	KANKAD KHEDA	77.036	23.101	52
1279	Madhya Pradesh	Sehore	LARKUI NEW	77.209	22.817	69
1280	Madhya Pradesh	Sehore	RALA	77.314	22.69	142
1281	Madhya Pradesh	Seoni	DHARAMKUAN	79.7617	21.875	58
1282	Madhya Pradesh	Seoni	GAURABIBI	79.5131	22.7022	45
1283	Madhya Pradesh	Seoni	GHUNAI	79.5653	22.4411	74
1284	Madhya Pradesh	Seoni	KAURIA	79.8431	22.0172	60
1285	Madhya Pradesh	Seoni	KHAWASA	79.4719	21.7619	104
1286	Madhya Pradesh	Seoni	KURAI NEW	79.5008	21.8064	64
1287	Madhya Pradesh	Seoni	MAKARJHIR	79.6833	22.6906	212
1288	Madhya Pradesh	Seoni	RUKHAR	79.5306	21.8739	120
1289	Madhya Pradesh	Shahdol	JAISINGHNAGAR1	81.397	23.678	65
1290	Madhya Pradesh	Shahdol	SHAHDOL	81.36	23.299	50
1291	Madhya Pradesh	Shajapur	MAJHANIA	76.321	23.448	53
1292	Madhya Pradesh	Shajapur	MOMAN BADODIA	76.341	23.606	134
1293	Madhya Pradesh	Shajapur	NANDNI	76.938	23.318	120
1294	Madhya Pradesh	Shajapur	SALSALAI	76.538	23.464	54
1295	Madhya Pradesh	Shajapur	TILAWAD GOVIND	76.333	23.31	49
1296	Madhya Pradesh	Sheopur	BHAGWARA	76.6147	25.6733	276
1297	Madhya Pradesh	Sheopur	DHOBNI	77.58	25.8322	106

S.No.	State	District	Location	Long	Lat	NO3
1298	Madhya Pradesh	Sheopur	GARHI1	77.3058	26.12	186
1299	Madhya Pradesh	Sheopur	GHASWANI	77.5061	25.8917	106
1300	Madhya Pradesh	Sheopur	HARKUI	77.1792	26.1589	101
1301	Madhya Pradesh	Sheopur	PANCHONCOLONY	77.124	26.135	90
1302	Madhya Pradesh	Sheopur	PURA	76.9914	25.9533	178
1303	Madhya Pradesh	Sheopur	RAJPURA	76.6808	25.71	158
1304	Madhya Pradesh	Sheopur	VIJAYPURCOLONY	77.3644	26.0567	55
1305	Madhya Pradesh	Shivpuri	ACHHRONI NEW	78.231	24.992	127
1306	Madhya Pradesh	Shivpuri	AINPURA	77.41	25.647	270
1307	Madhya Pradesh	Shivpuri	AWAS	78.351	25.473	269
1308	Madhya Pradesh	Shivpuri	BADARWAS	77.568	24.975	150
1309	Madhya Pradesh	Shivpuri	BAMORKALAN NEW	78.151	24.886	73
1310	Madhya Pradesh	Shivpuri	BEHGWAN	78.103	25.629	79
1311	Madhya Pradesh	Shivpuri	BHONTI	78.1	25.32	82
1312	Madhya Pradesh	Shivpuri	KHAREH	77.724	25.103	65
1313	Madhya Pradesh	Shivpuri	LANGURI	78.123	25.484	93
1314	Madhya Pradesh	Shivpuri	MANIPURA NEW	77.606	25.213	57
1315	Madhya Pradesh	Shivpuri	MASOORI	77.93	25.1	78
1316	Madhya Pradesh	Shivpuri	NARWAR	77.833	25.651	48
1317	Madhya Pradesh	Shivpuri	PICHHORE	78.1903	25.1756	114
1318	Madhya Pradesh	Shivpuri	POHARI	77.365	25.541	78
1319	Madhya Pradesh	Shivpuri	SARSOD	78.051	25.423	75
1320	Madhya Pradesh	Shivpuri	SATANWARA	77.731	25.544	65
1321	Madhya Pradesh	Shivpuri	SEHORE	78.106	25.665	110
1322	Madhya Pradesh	Shivpuri	SEMRI	78.112	25.182	87
1323	Madhya Pradesh	Shivpuri	SIKANDARA	78.365	25.472	52
1324	Madhya Pradesh	Shivpuri	SITAPUR	78.207	25.133	270
1325	Madhya Pradesh	Shivpuri	TODA KAREA	78.185	25.453	60
1326	Madhya Pradesh	Sidhi	BASTUA	81.7086	23.9867	55
1327	Madhya Pradesh	Sidhi	CHILHERI KALAN	81.7917	24.4583	52
1328	Madhya Pradesh	Sidhi	MAJHAULI	81.63	24.12	68
1329	Madhya Pradesh	Tikamgarh	BIORAKHET	78.7917	25.115	76
1330	Madhya Pradesh	Tikamgarh	MAJNA	78.9972	24.8364	75
1331	Madhya Pradesh	Tikamgarh	ORCHHA	78.6411	25.3494	82
1332	Madhya Pradesh	Tikamgarh	PALERA	79.2375	25.0236	46
1333	Madhya Pradesh	Ujjain	CHAKRAWADA GRID	75.7111	23.2564	81
1334	Madhya Pradesh	Ujjain	CHHOTI GHADSOD	75.4528	23.1083	86
1335	Madhya Pradesh	Ujjain	KAIYTHA	76.0183	23.2331	65
1336	Madhya Pradesh	Ujjain	PALKHANDA	75.9481	23.0406	55
1337	Madhya Pradesh	Umaria	BICHUA	80.7467	23.4656	68
1338	Madhya Pradesh	Umaria	BIRSINGHPUR1	81.04	23.3667	58
1339	Madhya Pradesh	Umaria	PARASI	80.9436	23.6644	50
1340	Madhya Pradesh	Umaria	UMARIA	80.8347	23.5267	92
1341	Madhya Pradesh	Vidisha	ATARI KHEJDA	78.028	23.615	46
1342	Madhya Pradesh	Vidisha	BARETH	78	23.913	50
1343	Madhya Pradesh	Vidisha	BILARI	77.698	23.578	108
1344	Madhya Pradesh	Vidisha	DEHRI JAGIR	77.786	24.041	83
1345	Madhya Pradesh	Vidisha	DEOPUR	77.621	24.155	68
1346	Madhya Pradesh	Vidisha	GHATERA	78.124	23.807	69
1347	Madhya Pradesh	Vidisha	GYARASPUR1	78.114	23.667	130
1348	Madhya Pradesh	Vidisha	PATHARIA	77.819	24.115	62
1349	Madhya Pradesh	Vidisha	SALAIYA	77.576	23.608	68
1350	Madhya Pradesh	Vidisha	SIRONJ1	77.689	24.099	65
1351	Maharashtra	Ahmednagar	Banpimpri	74.8667	18.8333	79.8
1352	Maharashtra	Ahmednagar	Bhitkewadi	74.8967	18.6444	68.4
1353	Maharashtra	Ahmednagar	Bote	74.2278	19.2778	200.1
1354	Maharashtra	Ahmednagar	Chandanapuri	74.2	19.4833	67

S.No.	State	District	Location	Long	Lat	NO3
1355	Maharashtra	Ahmednagar	Chikhale	74.7167	18.8667	200.3
1356	Maharashtra	Ahmednagar	Dahigaon	74.8069	18.9625	200.2
1357	Maharashtra	Ahmednagar	Devlali	74.6208	19.475	80.3
1358	Maharashtra	Ahmednagar	Ghotan	75.3	19.4	200.4
1359	Maharashtra	Ahmednagar	Hivrebazar	74.6561	19.0772	60.2
1360	Maharashtra	Ahmednagar	Jakhangaon	74.6306	19.1056	80
1361	Maharashtra	Ahmednagar	Jamkhed	75.3167	18.7333	46.2
1362	Maharashtra	Ahmednagar	Jeur	74.8031	19.2128	200.5
1363	Maharashtra	Ahmednagar	Karanji	74.9847	19.1322	65.4
1364	Maharashtra	Ahmednagar	Khadki	74.6483	19.0181	49
1365	Maharashtra	Ahmednagar	Khamgaon	75.1703	19.3864	80.2
1366	Maharashtra	Ahmednagar	Khokar	74.7433	19.6158	58.4
1367	Maharashtra	Ahmednagar	Kokona-1	75.0875	19.4181	195.3
1368	Maharashtra	Ahmednagar	Kolpewadi-1	74.3697	19.8989	57.1
1369	Maharashtra	Ahmednagar	Kolwadi	74.9833	18.5167	65
1370	Maharashtra	Ahmednagar	Kotul	73.9731	19.4253	48.8
1371	Maharashtra	Ahmednagar	Mirajgaon-3	75.2167	18.7222	73.2
1372	Maharashtra	Ahmednagar	Nevasa Bk	74.9544	19.5267	200.1
1373	Maharashtra	Ahmednagar	Rahata	74.4833	19.7167	200.3
1374	Maharashtra	Ahmednagar	Sangamner	74.2208	19.5667	197
1375	Maharashtra	Ahmednagar	Supre	74.5389	18.9597	198.4
1376	Maharashtra	Ahmednagar	Takle-Kazi	74.8333	19.0333	156.9
1377	Maharashtra	Ahmednagar	Vadala Bhairoba	74.9	19.4333	63.7
1378	Maharashtra	Ahmednagar	Vadegaon Madhe	74.6167	18.6167	60.1
1379	Maharashtra	Akola	Akola	77.0017	20.7367	105
1380	Maharashtra	Akola	Ambashi	76.8592	20.4567	53
1381	Maharashtra	Akola	Chani	76.775	20.4611	76.7
1382	Maharashtra	Akola	Donad	77.1783	20.5606	96.6
1383	Maharashtra	Akola	Hatola	77.2044	20.5064	66.8
1384	MAHARASHTRA	Akola	Majhari	76.9219	20.59	101.4
1385	Maharashtra	Akola	Panaj	77.1364	21.1439	309.6
1386	Maharashtra	Akola	Patsul	77.0181	20.9861	58.1
1387	Maharashtra	Akola	Sasti	76.8331	20.5081	100.2
1388	MAHARASHTRA	Akola	Ural	76.825	20.8069	52.5
1389	Maharashtra	Akola	Wadegaon	77.0675	20.4686	204.2
1390	Maharashtra	Akola	Wyala	76.8875	20.675	304.4
1391	Maharashtra	Amravati	Anjansingi	78.1347	20.9167	47.6
1392	Maharashtra	Amravati	Ashtagaon	77.925	21.3083	48.2
1393	Maharashtra	Amravati	Belteki	77.9258	20.755	47.6
1394	Maharashtra	Amravati	Chandas	78.3444	21.4372	49.6
1395	Maharashtra	Amravati	Chandur Railway	77.9667	20.8167	47.4
1396	Maharashtra	Amravati	Chicholi	77.9444	21.36	48.1
1397	Maharashtra	Amravati	Dapori1	78.0514	21.3833	47.8
1398	Maharashtra	Amravati	Ghatlarki	77.8081	21.3336	47.9
1399	Maharashtra	Amravati	Khanapur	77.9542	21.3153	47.7
1400	Maharashtra	Amravati	Kurha	78.05	20.9333	45.9
1401	Maharashtra	Amravati	Loni	78.1903	21.3764	48.3
1402	Maharashtra	Amravati	Lontek-1	77.7072	20.9081	49
1403	Maharashtra	Amravati	Mahuli	77.7667	20.7333	46.9
1404	Maharashtra	Amravati	Mozari	78.0011	21.0506	48.9
1405	Maharashtra	Amravati	Nimbhari	77.3125	21.05	49.6
1406	Maharashtra	Amravati	Pala	78	21.3861	47.6
1407	Maharashtra	Amravati	Pathrot-2	77.365	21.2144	49.6
1408	Maharashtra	Amravati	Rithpur	77.8167	21.2417	49
1409	Maharashtra	Amravati	Saiwada	77.8692	21.3319	48.2
1410	Maharashtra	Amravati	Samda Kasmpur	77.2631	20.9269	49
1411	Maharashtra	Amravati	Sendurjana	78.1	20.6833	45.1

S.No.	State	District	Location	Long	Lat	NO3
1412	Maharashtra	Amravati	Shivni1	77.8522	20.6306	48.5
1413	Maharashtra	Amravati	Temburkheda1	78.2389	21.4972	46.7
1414	Maharashtra	Amravati	Teosa	78.0681	21.0836	47.7
1415	Maharashtra	Amravati	Walgaon	77.7	21.0167	46.6
1416	Maharashtra	Amravati	Warud	78.2667	21.4667	46.7
1417	Maharashtra	Amravati	Yevda	77.4586	20.9947	49.8
1418	Maharashtra	Aurangabad	Aalandh	75.9336	20.3411	68.3
1419	Maharashtra	Aurangabad	Abad Police HQ	75.315	19.8861	61
1420	Maharashtra	Aurangabad	Ajanta	75.7417	20.5417	60.4
1421	Maharashtra	Aurangabad	Bharadi	75.5619	20.3558	65.6
1422	Maharashtra	Aurangabad	Chauka	75.3944	20.0167	54.2
1423	Maharashtra	Aurangabad	Dahegaon Bangla	75.1186	19.7311	60.2
1424	Maharashtra	Aurangabad	Devgaon-1	75.0347	20.0347	67
1425	Maharashtra	Aurangabad	Fardapur-1	75.7083	20.5931	50.5
1426	Maharashtra	Aurangabad	Gangapur-3	75.0008	19.6994	60.3
1427	Maharashtra	Aurangabad	Garaj	74.8944	20.0564	59.9
1428	Maharashtra	Aurangabad	Golegaon Budruk	75.71	20.4564	85.2
1429	Maharashtra	Aurangabad	Hasta	75.2719	20.2911	78.1
1430	Maharashtra	Aurangabad	Hatnur1	75.1317	20.1697	64
1431	Maharashtra	Aurangabad	Jangla Tanda-1	75.6731	20.5828	51.7
1432	Maharashtra	Aurangabad	Kaigaon	75.6333	20.1667	78.1
1433	Maharashtra	Aurangabad	Kannad	75.1333	20.2667	85.4
1434	Maharashtra	Aurangabad	Khuldabad	75.1917	20.0003	64.8
1435	Maharashtra	Aurangabad	Kinnal	75.0667	20.0028	52.9
1436	Maharashtra	Aurangabad	Pachud-1	75.6333	19.5833	45.9
1437	Maharashtra	Aurangabad	Patni	75.4667	20.1175	81.6
1438	Maharashtra	Aurangabad	Shendra	75.4714	19.8683	66.3
1439	Maharashtra	Aurangabad	Soyegaon-1	75.6208	20.5914	48.1
1440	Maharashtra	Aurangabad	Taherpur	75.3353	19.6511	80
1441	Maharashtra	Aurangabad	Tunki	74.85	20.1333	89.4
1442	Maharashtra	Aurangabad	Varkhed (Rajangaon)	74.9119	19.7722	60.3
1443	Maharashtra	Aurangabad	Waghgaon	74.8311	19.8475	65.6
1444	Maharashtra	Aurangabad	Walur Tanda	75.15	20.0833	81.2
1445	Maharashtra	Beed	Chausala	75.6928	18.7119	59.6
1446	Maharashtra	Beed	Daskhed	75.5583	18.7667	68.6
1447	Maharashtra	Beed	Dindrur-1	76.2664	18.9892	80.2
1448	Maharashtra	Beed	Georai-1	75.7386	19.2747	77.2
1449	Maharashtra	Beed	Ghosapuri	75.7522	19.0511	45.4
1450	Maharashtra	Beed	Jirewadi-1	75.7583	19.0169	85.1
1451	Maharashtra	Beed	Khadkhat	75.15	18.6667	68.6
1452	Maharashtra	Beed	Kinhi	75.1808	18.9019	83.6
1453	Maharashtra	Beed	Kumbhawadi	75.7314	19.1431	64.3
1454	Maharashtra	Beed	Kumbhephal	76.1333	18.7167	77
1455	Maharashtra	Beed	Manur	75.3167	19.0667	92.4
1456	Maharashtra	Beed	Mauj	75.8833	18.9667	87.2
1457	Maharashtra	Beed	Nagjhara	75.7192	19.3297	65.8
1458	Maharashtra	Beed	Nandur Phata	75.8464	18.7761	70.8
1459	Maharashtra	Beed	Naygaon	75.6119	18.9133	45.4
1460	Maharashtra	Beed	Patoda	75.4667	18.8667	45.9
1461	Maharashtra	Beed	Patrud-1	76.2125	19.1003	81.8
1462	Maharashtra	Beed	Pinpalnar	75.9525	19.0439	71.1
1463	Maharashtra	Beed	Saigaon-1	76.4217	18.6672	79
1464	Maharashtra	Beed	Sheri Bk	75.085	18.8794	81.3
1465	Maharashtra	Beed	Shirsadevi	75.8628	19.2028	60.6
1466	Maharashtra	Beed	Tintarvani-1	75.5078	19.175	70.9
1467	Maharashtra	Beed	Umapur	75.6	19.2833	80
1468	Maharashtra	Beed	Uttareshwar Pimpri	75.9486	18.6811	60.7

S.No.	State	District	Location	Long	Lat	NO3
1469	Maharashtra	Beed	Wadwani	76.0333	18.9833	80.5
1470	Maharashtra	Beed	Waguli	76.1953	18.7947	80.9
1471	Maharashtra	Bhandara	Daodipar Khapa	79.6833	21.1	79.3
1472	Maharashtra	Bhandara	Jamb	79.5833	21.3833	65.8
1473	Maharashtra	Bhandara	Palari	79.7083	21.1333	88.3
1474	Maharashtra	Bhandara	Usarra	79.6722	21.3972	89
1475	Maharashtra	Buldhana	Amdapur	76.45	20.4167	87.8
1476	Maharashtra	Buldhana	Bhankheda	76.2419	20.3006	80.1
1477	Maharashtra	Buldhana	Deolgaon Raja	76.0333	20.0167	86.5
1478	Maharashtra	Buldhana	Dhad	76	20.4	84.6
1479	Maharashtra	Buldhana	Dhamangaon	76.0333	20.6667	84.1
1480	Maharashtra	Buldhana	Dighi	76.3367	20.8625	78.2
1481	Maharashtra	Buldhana	Garadgaon	76.55	20.6667	45.1
1482	Maharashtra	Buldhana	Godhnapur	76.5244	20.6758	45.8
1483	Maharashtra	Buldhana	Jalamb	76.5833	20.83	86.4
1484	Maharashtra	Buldhana	Jalgaonjamodnew	76.5353	21.05	72.1
1485	Maharashtra	Buldhana	Janephal	76.9606	20.5017	54.1
1486	Maharashtra	Buldhana	Khamgaon	76.575	20.7	45.9
1487	Maharashtra	Buldhana	Kingaon Raja	76.2444	19.9861	86.6
1488	Maharashtra	Buldhana	Loni	76.4053	20.2936	46
1489	Maharashtra	Buldhana	Mehkar	76.5667	20.15	90
1490	Maharashtra	Buldhana	Motala	76.2	20.6833	45.1
1491	Maharashtra	Buldhana	Patorda-1	76.7319	20.9486	84.4
1492	Maharashtra	Buldhana	Rohna	76.6725	20.6428	85.5
1493	Maharashtra	Buldhana	Sungaon-1	76.5569	21.0839	67.3
1494	Maharashtra	Buldhana	Tarvadi	76.35	20.7333	72.4
1495	Maharashtra	Buldhana	Tunki New	76.6911	21.1067	67.1
1496	Maharashtra	Buldhana	Undri	76.4639	20.4569	70.5
1497	Maharashtra	Buldhana	Warwand	76.6333	20.3472	90.4
1498	Maharashtra	Buldhana	Warwat Bakhal-1	76.7114	21.0236	62.5
1499	Maharashtra	Chandrapur	Bhimni	79.7167	19.8167	53.2
1500	Maharashtra	Chandrapur	Dabha	79.6208	19.625	80.7
1501	Maharashtra	Chandrapur	Jivati	79.0522	19.6089	68.5
1502	Maharashtra	Chandrapur	Ladbori	79.6308	20.3125	80.3
1503	Maharashtra	Chandrapur	Mahurli	79.3333	20.1833	57.3
1504	Maharashtra	Chandrapur	Maregaon	79.7347	20.2703	76.2
1505	Maharashtra	Chandrapur	Mendki	79.8333	20.4667	58.9
1506	Maharashtra	Chandrapur	Mohadi Mokasa	79.65	20.6458	68.1
1507	Maharashtra	Chandrapur	Ralegaon-1	79.1964	20.4094	77.5
1508	Maharashtra	Chandrapur	Rampur	79	20.4083	79.8
1509	Maharashtra	Chandrapur	Shegaon Khurd	79.1803	20.2936	69
1510	Maharashtra	Chandrapur	Sondo	79.3333	19.6667	69.1
1511	Maharashtra	Chandrapur	Tambegadi Mendha	79.7908	20.2111	70.7
1512	Maharashtra	Dhule	Borkund	74.8311	20.7181	69.5
1513	Maharashtra	Dhule	Chimthane	74.6833	21.1833	64.8
1514	Maharashtra	Dhule	Dhamnar	74.3772	20.9236	64.7
1515	Maharashtra	Dhule	Dhavda	74.4925	21.3378	84.1
1516	Maharashtra	Dhule	Dhule	74.7667	20.9042	70.5
1517	Maharashtra	Dhule	Dondaicha-1	74.5733	21.3236	69.6
1518	Maharashtra	Dhule	Hadakhed	74.9814	21.4239	56.9
1519	Maharashtra	Dhule	Hisala	75.1006	21.2667	54.1
1520	Maharashtra	Dhule	Ichhapur	74.4444	20.9722	61.4
1521	Maharashtra	Dhule	Kusumba	74.5983	20.9075	57.1
1522	Maharashtra	Dhule	Methi	74.6375	21.2458	80.2
1523	Maharashtra	Dhule	Mukti	74.95	20.8833	74.8
1524	Maharashtra	Dhule	Ner-1	74.5147	20.9361	62.5
1525	Maharashtra	Dhule	Phagne	74.8381	20.89	68.6

S.No.	State	District	Location	Long	Lat	NO3
1526	Maharashtra	Dhule	Purmepada(pur)	74.7	20.7283	70
1527	Maharashtra	Dhule	Sakri2	74.3167	20.9833	73.7
1528	Maharashtra	Dhule	Samaryapada	74.8997	21.4606	62
1529	Maharashtra	Dhule	Sarvad	74.7814	21.04	80.3
1530	Maharashtra	Dhule	Saver	75.0169	21.2961	45.2
1531	Maharashtra	Dhule	Shewade	74.5925	21.1506	65.5
1532	Maharashtra	Gadchiroli	Ashti	79.7917	19.6833	65.2
1533	Maharashtra	Gadchiroli	Bamni	79.9833	18.95	95.6
1534	Maharashtra	Gadchiroli	Bori	79.95	19.5	122.7
1535	Maharashtra	Gadchiroli	Chandona Tola	80.2667	20.55	80.2
1536	Maharashtra	Gadchiroli	Chatgaon	80.175	20.2083	120.4
1537	Maharashtra	Gadchiroli	Chaudampalli	79.85	19.6	132.5
1538	Maharashtra	Gadchiroli	Elchil	80.1517	19.5153	80.8
1539	Maharashtra	Gadchiroli	Ghot	79.9833	19.7917	49.5
1540	Maharashtra	Gadchiroli	Govindgaon	80.1203	19.1058	64.1
1541	Maharashtra	Gadchiroli	Govindpur	80.0014	20.0653	80.9
1542	Maharashtra	Gadchiroli	Itapalli	80.2333	19.6	64.2
1543	Maharashtra	Gadchiroli	Kitadi	79.9897	20.365	129.2
1544	Maharashtra	Gadchiroli	Maregaon-1	80.1178	20.3058	81.4
1545	Maharashtra	Gadchiroli	Nandigaon	80.0333	19.3	77.5
1546	Maharashtra	Gadchiroli	Rangi	80.1819	20.3472	109.3
1547	Maharashtra	Gadchiroli	Shankarpur	80.035	20.6272	77.8
1548	Maharashtra	Gadchiroli	Umanur	80.0667	19.05	94.4
1549	Maharashtra	Gadchiroli	Vihirgaon Kukdi	80.1681	20.6522	46.4
1550	Maharashtra	Gondia	Dhabetekdi	79.9647	20.79	79.7
1551	Maharashtra	Gondia	Khamari	80.2369	21.4189	79.6
1552	Maharashtra	Gondia	Navegaon II (KHURD)	79.8217	21.3464	58.7
1553	Maharashtra	Gondia	Rajegaon	80.2472	21.6139	57.5
1554	Maharashtra	Gondia	Salebardi	79.9403	20.9097	68.7
1555	Maharashtra	Gondia	Sejgaon	80.0183	21.4958	66.3
1556	Maharashtra	Hingoli	Aral-1	76.9833	19.3333	46
1557	Maharashtra	Hingoli	Chondi Amba-1	77.15	19.4333	46.4
1558	Maharashtra	Hingoli	Chudawa-1	77.1392	19.1697	74.6
1559	Maharashtra	Hingoli	Hivra	77.0831	19.6369	81
1560	Maharashtra	Hingoli	Kolsa	76.8667	19.8167	79.6
1561	Maharashtra	Hingoli	Salwa	77.3839	19.6075	51.6
1562	Maharashtra	Hingoli	Sawad	77.0525	19.7372	45.4
1563	Maharashtra	Hingoli	Songaon	76.8847	19.8006	74.5
1564	Maharashtra	Jalgaon	Adgaon	74.9028	20.5069	83.2
1565	Maharashtra	Jalgaon	Akhatwade	75.2697	21.2142	88.3
1566	Maharashtra	Jalgaon	Bhadgaon-1	75.2256	20.6719	86.2
1567	Maharashtra	Jalgaon	Bhadgaon-1	75.4544	20.6556	86.5
1568	Maharashtra	Jalgaon	Bodwad	75.9833	20.8833	90.1
1569	Maharashtra	Jalgaon	Dharangaon	75.2667	21.0169	88.5
1570	Maharashtra	Jalgaon	Erandol	75.3333	20.9167	86.2
1571	Maharashtra	Jalgaon	Faizupur	75.8597	21.1667	84.7
1572	Maharashtra	Jalgaon	Jalgaon - Harivitthal Nagar	75.5406	20.9989	67.8
1573	Maharashtra	Jalgaon	Jamner-1	75.7919	20.8006	89.6
1574	Maharashtra	Jalgaon	Jamthi	75.9703	20.8067	88.2
1575	Maharashtra	Jalgaon	Kasoda	75.3	20.825	87.6
1576	Maharashtra	Jalgaon	Kekat Nimbhora	75.7167	20.8311	85.3
1577	Maharashtra	Jalgaon	Khanapur-1	76.1022	21.275	80.2
1578	Maharashtra	Jalgaon	Kingaon	75.5819	21.2058	84.1
1579	Maharashtra	Jalgaon	Lasgaon	75.4556	20.7897	88.1
1580	Maharashtra	Jalgaon	Mendhoda	76.0333	21.1056	90.4
1581	Maharashtra	Jalgaon	Narvel	76.1208	21.1944	90.1
1582	Maharashtra	Jalgaon	Neri	75.6639	20.8539	88.1

S.No.	State	District	Location	Long	Lat	NO3
1583	Maharashtra	Jalgaon	Parola-1	75.1019	20.8825	87.2
1584	Maharashtra	Jalgaon	Pasardi	75.175	20.5806	81.6
1585	Maharashtra	Jalgaon	Pimpalkhede	75.2717	20.7472	90.8
1586	Maharashtra	Jalgaon	Pimpalkotha	75.3833	20.9917	87.3
1587	Maharashtra	Jalgaon	Raver1	76.0344	21.2472	63.2
1588	Maharashtra	Jalgaon	Sangvi Bk	75.7481	21.18	86.7
1589	Maharashtra	Jalgaon	Shendurni	75.6042	20.65	82.1
1590	Maharashtra	Jalgaon	Shengola	75.8125	20.6917	70.9
1591	Maharashtra	Jalgaon	Sirsala	75.05	20.9394	65.6
1592	Maharashtra	Jalgaon	Susari-Varangaon	75.9081	20.9975	87.4
1593	Maharashtra	Jalgaon	Talwade Kd	75.1	20.7306	61.4
1594	Maharashtra	Jalgaon	Vakdi	75.8208	20.6708	84.8
1595	Maharashtra	Jalgaon	Varkhedi-1	75.9789	20.96	89.8
1596	Maharashtra	Jalgaon	Vivra Bk	75.9881	21.2031	86.1
1597	Maharashtra	Jalgaon	Yawal-1	75.6986	21.1508	88.9
1598	Maharashtra	Jalna	Ambad	75.7833	19.6	45.5
1599	Maharashtra	Jalna	Banegaon	75.8433	20.12	70.4
1600	Maharashtra	Jalna	Baranjala Lokhande	75.8286	20.1944	72.4
1601	Maharashtra	Jalna	Bavne Pangri	75.8692	19.9842	67
1602	Maharashtra	Jalna	Bhokardhan-2	75.7703	20.2508	69.3
1603	Maharashtra	Jalna	Chanegaon	75.8275	20.0194	75.6
1604	Maharashtra	Jalna	Danapur	75.8253	20.3114	70
1605	Maharashtra	Jalna	Dhoksal	76.3675	19.7458	63.8
1606	Maharashtra	Jalna	Dungaon-1	75.6594	19.5175	75.8
1607	Maharashtra	Jalna	Gondegaon-1	75.9311	19.9364	74.8
1608	Maharashtra	Jalna	Hasnabad-1	75.6931	20.1269	67.1
1609	Maharashtra	Jalna	Longaon	75.8989	20.05	90
1610	Maharashtra	Jalna	Navha	76.0389	19.9167	64.1
1611	Maharashtra	Jalna	Partur-2	76.2258	19.585	81.5
1612	Maharashtra	Jalna	Pimpalgaon Renukai	75.8911	20.5511	75.4
1613	Maharashtra	Jalna	Pokhari Sindhkhed	75.9583	19.9811	66.7
1614	Maharashtra	Jalna	Shirner	75.7339	19.6142	72.1
1615	Maharashtra	Jalna	Shreshti	76.2333	19.475	80.4
1616	Maharashtra	Jalna	Siphora	75.8567	20.2603	72.7
1617	Maharashtra	Jalna	Talni	76.4444	19.8833	90.1
1618	Maharashtra	Jalna	Utavad	76.0678	19.765	65.4
1619	Maharashtra	Jalna	Wakdi	75.7917	20.3667	89
1620	Maharashtra	Jalna	Yenora Dhanora	76.1347	19.7281	65.7
1621	Maharashtra	Kolhapur	Halkarne	74.4694	16.1694	61.4
1622	Maharashtra	Kolhapur	Shirol	74.6042	16.7381	54.1
1623	Maharashtra	Latur	Ashta	76.7569	18.4592	88.1
1624	Maharashtra	Latur	Borgaon Kale	76.3139	18.4083	83.5
1625	Maharashtra	Latur	Kasar Belkunda-1	76.8497	17.9417	45.8
1626	Maharashtra	Latur	Kingaon	76.7722	18.7611	89.1
1627	Maharashtra	Latur	Murud-Akola	76.4	18.4	69.3
1628	Maharashtra	Latur	Panchincholi	76.2333	18.4	69.2
1629	Maharashtra	Latur	Pandharwadi	76.8903	18.3464	69.7
1630	Maharashtra	Latur	Pangaon	76.6292	18.6267	73.4
1631	Maharashtra	Latur	Rapka	76.805	18.3536	45
1632	Maharashtra	Latur	Samdarga	76.4361	18.2514	81.2
1633	Maharashtra	Latur	Walandi-1	76.9744	18.2331	70.6
1634	Maharashtra	Nagpur	Ashti	78.9683	21.2019	45.1
1635	Maharashtra	Nagpur	Bhasali Takli	78.9906	21.3533	60
1636	Maharashtra	Nagpur	Gahuhivra	79.2439	21.2528	60.9
1637	Maharashtra	Nagpur	Jaialkheda_1	78.4175	21.3847	70.1
1638	Maharashtra	Nagpur	Kelod	78.8764	21.4597	60.5
1639	Maharashtra	Nagpur	Khairgaon	78.9567	21.1858	60.4

S.No.	State	District	Location	Long	Lat	NO3
1640	Maharashtra	Nagpur	Khapri	78.835	21.2353	56.1
1641	Maharashtra	Nagpur	Kharpada	79.3475	21.5308	74.1
1642	Maharashtra	Nagpur	Kothulna	79.0356	21.4194	76
1643	Maharashtra	Nagpur	Linga	78.8214	21.2028	66.8
1644	Maharashtra	Nagpur	Lohgad	78.7231	21.3422	68
1645	Maharashtra	Nagpur	Manegaon Tek	79.4222	21.6806	76.9
1646	Maharashtra	Nagpur	Metpanjara	78.7128	21.2514	61.4
1647	Maharashtra	Nagpur	Mohad	78.4458	21.4686	45.2
1648	Maharashtra	Nagpur	Nagalwadi	79.0167	21.5667	87.4
1649	Maharashtra	Nagpur	Narkhed	78.5333	21.4667	45.1
1650	Maharashtra	Nagpur	Parseoni	79.1667	21.55	60.1
1651	Maharashtra	Nagpur	Saoner-1	78.9406	21.3897	60.4
1652	Maharashtra	Nagpur	Sathnaori	78.8	21.1333	68.2
1653	Maharashtra	Nagpur	Singori	79.0669	20.7453	64.1
1654	Maharashtra	Nagpur	Takalghat	78.9439	20.9144	57.5
1655	Maharashtra	Nagpur	Tarsha	79.3811	21.2258	60.1
1656	Maharashtra	Nanded	Ambe Sangwi	77.1875	19.0042	56.3
1657	Maharashtra	Nanded	Anjankhed	78.0778	19.8389	132.8
1658	Maharashtra	Nanded	Bhokar	77.6833	19.2167	76
1659	Maharashtra	Nanded	Dhanegaon	77.3297	19.13	51.7
1660	Maharashtra	Nanded	Dharmabad	77.85	18.8833	67.5
1661	Maharashtra	Nanded	Gadga	77.4606	18.8069	52
1662	Maharashtra	Nanded	Gokunda (Kinwat)-1	78.2333	19.5833	60.9
1663	Maharashtra	Nanded	Jamb Buzurg	77.1833	18.6561	80.2
1664	Maharashtra	Nanded	Jhalakwadi	78.0833	19.3417	67.9
1665	Maharashtra	Nanded	Khambegaon	77.0731	18.9906	80
1666	Maharashtra	Nanded	Kolambi	77.4178	18.89	56.8
1667	Maharashtra	Nanded	Kuncheli	77.5631	18.7694	53
1668	Maharashtra	Nanded	Nagapur	77.6992	19.2125	81.1
1669	Maharashtra	Nanded	Nanded	77.3394	19.1906	54.1
1670	Maharashtra	Nanded	Narwat	77.6333	19.2333	123.7
1671	Maharashtra	Nanded	Pada Tharoda	77.2906	19.2094	63.9
1672	Maharashtra	Nanded	Unkeshwar	78.2	19.85	85
1673	Maharashtra	Nandurbar	Loy	74.1306	21.4153	67.8
1674	MAHARASHTRA	Nandurbar	Rampur	74.4464	21.6944	80.6
1675	Maharashtra	Nandurbar	Sundarde-1	74.1881	21.3886	204.1
1676	Maharashtra	Nandurbar	Wadali-1	74.6178	21.4556	67.1
1677	Maharashtra	Nashik	Andarsul	74.5917	20.0014	85.8
1678	Maharashtra	Nashik	Angangaon	74.4683	20.0339	54.8
1679	Maharashtra	Nashik	Baragaon Pimpri	74.0833	19.8447	118.8
1680	Maharashtra	Nashik	Chandwad	74.2375	20.2583	82.5
1681	Maharashtra	Nashik	Chikhalohol	74.6333	20.6	71.2
1682	Maharashtra	Nashik	Deola-1	74.1839	20.4639	115.3
1683	Maharashtra	Nashik	Dhotarkheda	74.0525	20.2258	103.6
1684	Maharashtra	Nashik	Dindori	73.8167	20.2	52.1
1685	Maharashtra	Nashik	Ghagbari	73.7675	20.4467	60.4
1686	Maharashtra	Nashik	Gosrane	73.9256	20.5	61.3
1687	Maharashtra	Nashik	Jaikheda	74.2033	20.7925	96.3
1688	Maharashtra	Nashik	Jalgaon	74.1111	20.0639	116.9
1689	Maharashtra	Nashik	Kalvan	74.0356	20.4925	150.4
1690	Maharashtra	Nashik	Karanjagavan	74.5417	20.6333	50.7
1691	Maharashtra	Nashik	Malwadi-1	74.0847	19.7733	103.4
1692	Maharashtra	Nashik	Marhal Kh	74.1822	19.78	110
1693	Maharashtra	Nashik	Matori	73.7425	20.0539	60
1694	Maharashtra	Nashik	Nampur-1	74.3156	20.7328	52.9
1695	Maharashtra	Nashik	Nandgaon	74.6583	20.3083	79.6
1696	Maharashtra	Nashik	Pathre Bk	74.3356	19.8297	153.6

S.No.	State	District	Location	Long	Lat	NO3
1697	Maharashtra	Nashik	Pimpalgaon Baswant	73.9833	20.1708	49
1698	Maharashtra	Nashik	Pimplekothi	74.1356	20.8269	167.2
1699	Maharashtra	Nashik	Purangaon-Jalgaon	74.3681	20.0503	80.2
1700	Maharashtra	Nashik	Satana	74.2042	20.6	83.3
1701	Maharashtra	Nashik	Savargaon	74.4611	20.3575	125.5
1702	Maharashtra	Nashik	Sinnar	74	19.8333	83.1
1703	Maharashtra	Nashik	Sogras	74.1167	20.3	65.3
1704	Maharashtra	Nashik	Toharabad-1	74.1333	20.7822	105.9
1705	Maharashtra	Nashik	Umrane-1	74.35	20.4219	89.5
1706	Maharashtra	Nashik	Umrade Bk	73.7183	20.1958	59
1707	Maharashtra	Nashik	Vavi	73.8878	20.3411	71.7
1708	Maharashtra	Nashik	Virgaon	74.1342	20.6936	171.6
1709	Maharashtra	Nashik	Wadgaon Pimpala	73.8811	19.8728	52.4
1710	Maharashtra	Osmanabad	Dhoki	76.1	18.3739	49
1711	Maharashtra	Osmanabad	Govindpur	76.0914	18.4556	51.9
1712	Maharashtra	Osmanabad	Osmanabad-1	76.0342	18.18	77.8
1713	Maharashtra	Parbhani	Ambarwadi	77.0894	20.1847	214.3
1714	Maharashtra	Parbhani	Bori	76.7225	19.4856	61.4
1715	Maharashtra	Parbhani	Devgaon	76.4625	19.6142	67.3
1716	Maharashtra	Parbhani	Gojegaon	76.9444	19.5394	68.3
1717	Maharashtra	Parbhani	Hadgaon-1	76.3133	19.3136	47.7
1718	Maharashtra	Parbhani	Jhari-1	76.7658	19.4264	74
1719	Maharashtra	Parbhani	Jintur	76.6833	19.6167	85.3

S.No.	State	District	Location	Long	Lat	NO3
1720	Maharashtra	Parbhani	Kola	76.5617	19.3439	72
1721	Maharashtra	Parbhani	Kotamwadi	76.7333	19.1167	86.3
1722	Maharashtra	Parbhani	Panchegaon-1	76.7094	19.5558	213
1723	Maharashtra	Parbhani	Pedgaon2	76.6583	19.325	89
1724	Maharashtra	Parbhani	Pedgaon-3	76.6781	19.3033	62.5
1725	Maharashtra	Parbhani	Rani Sawargaon-1	76.8494	18.8783	71.2
1726	Maharashtra	Parbhani	Selu	76.4042	19.3681	75.4
1727	Maharashtra	Parbhani	Shirshi (Bk)	76.6	19.075	48.1
1728	Maharashtra	Parbhani	Sonpeth	76.4717	19.0256	65.6
1729	Maharashtra	Parbhani	Tarborgaon	76.6083	19.3239	79.6
1730	Maharashtra	Pune	Dorlewadi	74.6111	18.0844	47.2
1731	Maharashtra	Pune	Parne	74.05	18.6333	45.1
1732	Maharashtra	Pune	Patas	74.4333	18.4333	47.2
1733	Maharashtra	Sangli	Ashta	74.4094	16.9536	52.5
1734	Maharashtra	Sangli	Bambwade	74.4958	17.0836	61.4
1735	Maharashtra	Sangli	Borgaon	74.3258	17.0808	53.4
1736	Maharashtra	Sangli	Jath	75.2167	17.05	49
1737	Maharashtra	Sangli	Kawathe Mahankal	74.8694	17.0008	200.1
1738	Maharashtra	Sangli	Kirloskarwadi	74.4122	17.0883	62.9
1739	Maharashtra	Sangli	Kuchi	74.8644	17.0506	200.2
1740	Maharashtra	Sangli	Kumbhari	75.1181	17.1083	61.4
1741	Maharashtra	Sangli	Palashi	75.3514	17.3514	62.6
1742	Maharashtra	Sangli	Panmalewadi	74.4667	17.1333	58.8
1743	Maharashtra	Sangli	Peth	74.2333	17.0508	70.1
1744	Maharashtra	Sangli	Sangli_Sangalwadi	74.5536	16.8831	68.4
1745	Maharashtra	Sangli	Shene	74.1861	17.1011	47.2
1746	Maharashtra	Sangli	Tasgaon	74.9006	17.4236	81.6
1747	Maharashtra	Sangli	Tung	74.4931	16.9219	49.2
1748	Maharashtra	Sangli	Yevali	74.5167	17.0667	77.7
1749	Maharashtra	Satara	Arvi-1	74.2278	17.5089	50.7
1750	Maharashtra	Satara	Barad	74.5861	17.9508	140
1751	Maharashtra	Satara	Lonand	74.1883	18.0458	59.5

S.No.	State	District	Location	Long	Lat	NO3
1752	Maharashtra	Satara	Mayani	74.6969	17.7844	64.9
1753	Maharashtra	Satara	Mirgaon	74.35	17.9667	64.7
1754	Maharashtra	Satara	Pimpode (Bk)-1	74.0922	17.9133	69.5
1755	Maharashtra	Satara	Rehmatpur	74.2	17.6	55.7
1756	Maharashtra	Satara	Surur	73.9833	17.9667	51
1757	Maharashtra	Solapur	Angar	75.575	17.8953	80.7
1758	Maharashtra	Solapur	Bhandi-Shegaon	75.2167	17.7167	119.6
1759	Maharashtra	Solapur	Chincholi	76.05	17.6	103.1
1760	Maharashtra	Solapur	Eklaspur	75.3833	17.5333	102.3
1761	Maharashtra	Solapur	Madha	75.5164	18.0383	110.1
1762	Maharashtra	Solapur	Malegaon	75.8958	18.0639	52.5
1763	Maharashtra	Solapur	Manegaon	75.7875	18.0678	179.9
1764	Maharashtra	Solapur	Mohol	75.6447	17.8097	75.5
1765	Maharashtra	Solapur	Nandni	75.8528	17.4569	76.6
1766	Maharashtra	Solapur	Nari	75.8875	18.1958	142.8
1767	Maharashtra	Solapur	Pandharpur	75.325	17.675	215.1
1768	Maharashtra	Solapur	Parite	75.2672	17.9542	70.7
1769	Maharashtra	Solapur	Ranzani	75.4	17.6167	153.1
1770	Maharashtra	Solapur	Rople	75.4	17.7833	104.3
1771	Maharashtra	Solapur	Sohole	75.6333	17.6167	69.1
1772	Maharashtra	Solapur	Soregaon	75.8833	17.5917	70.8
1773	Maharashtra	Solapur	Varkute	75.3333	18.25	119.9
1774	Maharashtra	Solapur	Velapur	75.05	17.8	64.3
1775	Maharashtra	Solapur	Wagdhari-1	76.2125	17.4458	80.9
1776	Maharashtra	Thane	Khodala	73.4	19.8	46.8
1777	Maharashtra	Wardha	Adgaon	78.528	20.5832	197.8
1778	Maharashtra	Wardha	Ajansara	78.6713	20.4093	200.5
1779	Maharashtra	Wardha	Alipur	78.6942	20.5489	55.3
1780	Maharashtra	Wardha	Anji	78.5167	20.85	87.1
1781	Maharashtra	Wardha	Bhidi	78.4036	20.5717	64
1782	Maharashtra	Wardha	Dahigaon	78.4853	20.7544	80.2
1783	Maharashtra	Wardha	Dhadi	78.2333	21.2667	135.5
1784	Maharashtra	Wardha	Dhondgaon	79.0578	20.6317	70.9
1785	Maharashtra	Wardha	Giroli	78.585	20.5489	114.2
1786	Maharashtra	Wardha	Helodi	78.845	20.8053	79.4
1787	Maharashtra	Wardha	Hinganghat	78.8167	20.55	56.1
1788	Maharashtra	Wardha	Hingni	78.7167	20.9083	84.8
1789	Maharashtra	Wardha	Jamni	78.5822	20.8614	84.8
1790	Maharashtra	Wardha	Jhadshi	78.6391	20.8623	203.9
1791	Maharashtra	Wardha	Kangaon	78.6142	20.5108	81.4
1792	Maharashtra	Wardha	Kapsi	78.5978	20.435	61.3
1793	Maharashtra	Wardha	Karanji Kaji	78.7286	20.7072	64.9
1794	Maharashtra	Wardha	Khandali	78.9256	20.7375	84.2
1795	Maharashtra	Wardha	Kharangana	78.4833	20.9167	62.7
1796	Maharashtra	Wardha	Lahan Arvi	78.1406	21.2206	195.9
1797	Maharashtra	Wardha	Madni (New)	78.775	20.655	78.7
1798	Maharashtra	Wardha	Muradgaon (Balsare)1	78.4161	20.6917	190.6
1799	Maharashtra	Wardha	Nagalwadi	78.4333	21.1667	64.6
1800	Maharashtra	Wardha	Paragothan-1	78.2833	20.9	53.8
1801	Maharashtra	Wardha	Pipri	78.7353	20.3889	88.2
1802	Maharashtra	Wardha	Rasulabad	78.3636	20.771	200.2
1803	Maharashtra	Wardha	Rohna	78.3258	20.8531	74.2
1804	Maharashtra	Wardha	Sahur	78.2417	21.3083	203.9
1805	Maharashtra	Wardha	Sakhra	79.1008	20.5461	79.9
1806	Maharashtra	Wardha	Sonegaon	78.7167	20.6167	80.2
1807	Maharashtra	Wardha	Thanegaon-1	78.4731	21.1506	55.4
1808	Maharashtra	Wardha	Thar	78.2403	21.2061	70.1

S.No.	State	District	Location	Long	Lat	NO3
1809	Maharashtra	Wardha	Tigaon	78.5236	20.7639	75.4
1810	Maharashtra	Wardha	Vijaygopal	78.3331	20.5742	194.8
1811	Maharashtra	Wardha	Virul-1	78.3408	20.8039	76.2
1812	Maharashtra	Wardha	Wadhona-1	78.3458	20.9972	80.3
1813	Maharashtra	Wardha	Wasi	79.0333	20.5167	87.8
1814	Maharashtra	Wardha	Yelakeli	78.5903	20.8139	88.1
1815	Maharashtra	Washim	Aasegaon	77.3347	20.1347	58.6
1816	Maharashtra	Washim	Bitoda (Bhoyar)	77.2667	20.1833	80.7
1817	Maharashtra	Washim	Dhanora	77.3331	20.2039	69.4
1818	Maharashtra	Washim	Donad Budruk	77.2058	20.1336	60
1819	Maharashtra	Washim	Enzori	77.5083	20.3958	53.6
1820	Maharashtra	Washim	Giroli	77.4756	20.2086	68.4
1821	Maharashtra	Washim	Kenwad	76.8167	20.2	60
1822	Maharashtra	Washim	Nagalwadi	77.6192	20.6469	50.8
1823	Maharashtra	Washim	Rithad	76.9833	20.05	61.6
1824	Maharashtra	Washim	Sakhar Doha	77.4	20.2667	90.7
1825	Maharashtra	Washim	Sangaon	77.3528	20.1931	66.3
1826	Maharashtra	Washim	Sendurjan Adhao	77.45	20.1458	50.5
1827	Maharashtra	Washim	Shaha	77.4667	20.525	73.1
1828	Maharashtra	Washim	Wada	77.3333	20.3667	75.5
1829	Maharashtra	Yavatmal	Aamli	78.4028	20.2322	80.4
1830	Maharashtra	Yavatmal	Chatari	78.05	20.0208	80.2
1831	Maharashtra	Yavatmal	Darwha	77.7697	20.3028	87.3
1832	Maharashtra	Yavatmal	Dhanaj (Manekwada)	77.925	20.5292	80.7
1833	Maharashtra	Yavatmal	Dhanki1	77.8333	19.5656	71.9
1834	Maharashtra	Yavatmal	Ghatanji	78.3167	20.1333	81.8
1835	Maharashtra	Yavatmal	Injhala	78.3167	20.0833	87.4
1836	Maharashtra	Yavatmal	Jamni	78.7356	19.8603	45.1
1837	Maharashtra	Yavatmal	Kalamb	78.3333	20.45	88.6
1838	Maharashtra	Yavatmal	Karanji1	78.6025	20.1333	87.1
1839	Maharashtra	Yavatmal	Khatara	78.6464	20.1511	84.2
1840	Maharashtra	Yavatmal	Kolambi	78.1833	20.2417	86.4
1841	Maharashtra	Yavatmal	Kotha	78.2778	20.5306	86
1842	Maharashtra	Yavatmal	Mahagaon taluka	77.78	19.7819	81.9
1843	Maharashtra	Yavatmal	Mardi	78.85	20.2167	88.4
1844	Maharashtra	Yavatmal	Maregaon	78.8167	20.1	78.6
1845	Maharashtra	Yavatmal	Marwadi Khurd	77.3667	19.9583	84.6
1846	Maharashtra	Yavatmal	Metikheda	78.4197	20.2489	81.9
1847	Maharashtra	Yavatmal	Mohada	78.4667	20.2167	84.2
1848	Maharashtra	Yavatmal	Mohgaon Kasba	77.8833	20.2	76.4
1849	Maharashtra	Yavatmal	Mowada	78.4094	20.1344	85.5
1850	Maharashtra	Yavatmal	Naygaon	78.2008	20.5481	84.8
1851	Maharashtra	Yavatmal	Pahapal	78.5	19.9833	82.6
1852	Maharashtra	Yavatmal	Pimpri Durg	78.5292	20.4108	86.8
1853	Maharashtra	Yavatmal	Sangwi Rly	77.6053	20.4192	45.5
1854	Maharashtra	Yavatmal	Savar	78.0667	20.4978	68.1
1855	Maharashtra	Yavatmal	Selodi	77.7667	20.3167	80.2
1856	Maharashtra	Yavatmal	Singad	77.6356	20.0525	83.6
1857	Maharashtra	Yavatmal	Talni	78.1422	20.1411	84.8
1858	Maharashtra	Yavatmal	Vai (Lingi)	77.7717	20.1917	88.9
1859	Maharashtra	Yavatmal	Wani-1	78.9553	20.0478	86.6
1860	Maharashtra	Yavatmal	Zadgaon	78.5528	20.3719	90.3
1861	Nagaland	Dimapur	7th Mile Colony Dimapur	93.7742	25.8439	46.7
1862	Odisha	Anugul	Barhabahal	85.1	20.755	45
1863	Odisha	Anugul	Bhogabereni	85.2139	20.8917	46
1864	Odisha	Anugul	Durgapur 1	84.8828	20.9181	48
1865	Odisha	Anugul	Handpa 1	84.6872	20.9536	45

S.No.	State	District	Location	Long	Lat	NO3
1866	Odisha	Anugul	Pabitrannagar pz	85.1678	21.1394	48
1867	Odisha	Anugul	Sipur	85.1569	21.1667	46
1868	Odisha	Balangir	Bandupalla	83.0936	20.4722	46
1869	Odisha	Balangir	Chormara	83.2917	20.3047	45
1870	Odisha	Balangir	Dumabata	83.0769	20.5486	46
1871	Odisha	Balangir	Ghambari	82.9433	20.7214	46
1872	Odisha	Balangir	Tarasingi	83.2703	20.2864	46
1873	Odisha	Baleshwar	Tenda	86.7053	21.465	99
1874	Odisha	Bargarh	Dangabahal 1	83.3528	20.9425	48
1875	Odisha	Bargarh	Grinjal	83.3742	21.3367	48
1876	Odisha	Bargarh	Khuntapali	83.6153	21.2853	46
1877	Odisha	Bargarh	Kodabahal 2	83.8475	21.3128	45
1878	Odisha	Bargarh	Padampur2	83.0711	20.9992	45
1879	Odisha	Bargarh	Remenda	83.7625	21.2667	45
1880	Odisha	Bargarh	Sarandapali	83.4933	21.2361	45
1881	Odisha	Bargarh	Shukutapali	83.7167	21.3658	47
1882	Odisha	Baudh	Anlapali	84.0958	20.8067	71
1883	Odisha	Baudh	Badhigaon	84.2822	20.7764	49
1884	Odisha	Baudh	Bala Singha	84.2706	20.8556	48
1885	Odisha	Baudh	Dahya	84.0064	20.8308	77
1886	Odisha	Baudh	Ghantapada-I	83.6739	20.54	68
1887	Odisha	Baudh	Gundulia	84.0731	20.7025	64
1888	Odisha	Baudh	Karoda Kutha	84.4253	20.5442	50
1889	Odisha	Baudh	Khajuripada	84.1386	20.6958	59
1890	Odisha	Baudh	Kusanga	84.6553	20.5883	76
1891	Odisha	Baudh	Nuapada 1(Tikira sahi)	84.4578	20.5672	53
1892	Odisha	Baudh	Palasaguda1	83.8072	20.7272	59
1893	Odisha	Baudh	Usbelika	84.0778	20.7444	76
1894	Odisha	Bhadrak	Agarpara	86.3944	21.2089	93
1895	Odisha	Bhadrak	Dhamnagar 1	86.4403	20.9114	52
1896	Odisha	Bhadrak	Kothar 3	86.5211	20.9219	47
1897	Odisha	Bhadrak	Sunchar (Kusun Nagar)	86.4394	21.1522	98
1898	Odisha	Cuttack	Abhimanpur	85.4375	20.4444	61
1899	Odisha	Cuttack	Baramba	85.3458	20.4175	53
1900	Odisha	Cuttack	C-13 Mahammadia Bazar	85.8583	20.4708	45
1901	Odisha	Cuttack	Gopapur	85.2958	20.4028	60
1902	Odisha	Cuttack	Kanapur	85.1833	20.4056	94
1903	Odisha	Cuttack	Karadibandh	85.2847	20.3792	68
1904	Odisha	Cuttack	Madhab	86.1028	20.0792	47
1905	Odisha	Cuttack	Niali	86.0644	20.1308	46
1906	Odisha	Cuttack	Sankhmiri	85.3361	20.375	73
1907	Odisha	Cuttack	Saradapur	84.9667	20.5292	71
1908	Odisha	Cuttack	Tigiria	85.5208	20.465	76
1909	Odisha	Dhenkanal	Babandh	85.4297	20.7206	45
1910	Odisha	Dhenkanal	Bhapur2	85.4931	20.5625	46
1911	Odisha	Dhenkanal	Bhuban	85.8342	20.8844	46
1912	Odisha	Gajapati	Luhaguda	84.3625	19.4594	45
1913	Odisha	Ganjam	Buguda1	84.7903	19.8097	46
1914	Odisha	Ganjam	Ganjam	85.0347	19.3736	46
1915	Odisha	Ganjam	Gopalpur 1	84.775	19.2589	45
1916	Odisha	Ganjam	Gudiali	84.7839	19.5675	45
1917	Odisha	Ganjam	Jagannathprasad	84.7778	19.9708	45
1918	Odisha	Ganjam	Mantridi	84.7719	19.1889	45
1919	Odisha	Ganjam	Narendrapur	84.8694	19.335	48
1920	Odisha	Ganjam	Pochilima	84.7467	19.4542	48
1921	Odisha	Ganjam	Polasora	84.8194	19.6917	51
1922	Odisha	Ganjam	Soroda	84.4367	19.7572	47

S.No.	State	District	Location	Long	Lat	NO3
1923	Odisha	Ganjam	Tilisingi	84.6322	20.0189	47
1924	Odisha	Kalahandi	Attanguda	83.1589	19.8658	45
1925	Odisha	Kalahandi	Bakatpur	83.4239	19.8433	45
1926	Odisha	Kalahandi	Mahichala	82.8458	19.7778	45
1927	Odisha	Kalahandi	Tundala 1	83.3542	20.2969	45
1928	Odisha	Kandhamal	Kurtamgarh	83.7569	20.0597	46
1929	Odisha	Kendrapara	Barua 1	86.4569	20.5428	53
1930	Odisha	Kendrapara	Laxminarayanpur	86.3222	20.555	50
1931	Odisha	Khordha	B-42 Kargil Basti	85.8214	20.2397	48
1932	Odisha	Khordha	Begunia 1	85.4547	20.2033	46
1933	Odisha	Koraput	Umeri1	82.5697	18.9	47
1934	Odisha	Malkangiri	Katameta	82.0758	18.4603	48
1935	Odisha	Malkangiri	Kudumuluguma1	82.1917	18.3869	48
1936	Odisha	Mayurbhanj	Gambharia	86.1417	22.3314	45
1937	Odisha	Mayurbhanj	Rashgovindpur 1	87.0453	21.7839	51
1938	Odisha	Mayurbhanj	Satkosia	86.1478	21.3578	45
1939	Odisha	Mayurbhanj	Udala	86.535	21.5458	48
1940	Odisha	Nabarangapur	Debugaon	82.4083	19.4528	46
1941	Odisha	Nabarangapur	Dondasora	82.0694	19.6597	45
1942	Odisha	Nayagarh	Ghholahandi	84.9531	20.3503	48
1943	Odisha	Nayagarh	Nuagaon1	84.9728	20.2528	47
1944	Odisha	Nayagarh	Rangamatia	84.7831	20.3717	49
1945	Odisha	Puri	Alipada	85.7622	19.8125	47
1946	Odisha	Puri	Budhiabar	85.7403	19.8089	46
1947	Odisha	Puri	Delang	85.7694	20.0361	45
1948	Odisha	Puri	P-30 Jagannath Temple	85.8178	19.8056	45
1949	Odisha	Puri	P-31 Sweta Ganga	85.8186	19.8011	45
1950	Odisha	Puri	P-37 Jagannatha Ballava Matha	85.8247	19.8106	48
1951	Odisha	Puri	P-41 Grand Road	85.8281	19.8119	46
1952	Odisha	Puri	P-48 Sonar Gauranga	85.8461	19.8069	49
1953	Odisha	Puri	P-49 Dola Mandap Sahi	85.8233	19.8044	47
1954	Odisha	Puri	P-50 Baselisahi	85.8136	19.8036	49
1955	Odisha	Puri	Satapada-I	85.4483	19.6711	46
1956	Odisha	Rayagada	Ambadola	83.4581	19.8353	48
1957	Odisha	Sambalpur	Badsahir	84.1322	21.3983	62
1958	Odisha	Sambalpur	Bamra	84.2903	22.0506	47
1959	Odisha	Sambalpur	Batemura	83.9833	21.3672	46
1960	Odisha	Sambalpur	Rairakhol(rampu	84.3333	21.0667	55
1961	Odisha	Sonapur	Baghahandi	83.6361	21.0581	47
1962	Odisha	Sonapur	Karlajuri	83.4653	21.0117	47
1963	Odisha	Sonapur	Phulmuthi	83.7922	20.995	47
1964	Odisha	Sonapur	Sakama	83.7781	20.9247	48
1965	Odisha	Sonapur	Saledi	83.8036	20.9578	46
1966	Odisha	Sonapur	Sargaj 1	83.6719	20.7069	45
1967	Pondicherry	Karaikal	Karaikal dw	79.8314	10.9322	115.2
1968	Pondicherry	Karaikal	Kilakasakudi	79.8417	10.9333	45.5
1969	Pondicherry	Karaikal	Kottucherry	79.8167	10.9583	58
1970	Pondicherry	Karaikal	Thirunallur	79.7922	10.9261	46.6
1971	Pondicherry	Pondicherry	Manapattu EW	79.7747	11.7992	68.2
1972	Pondicherry	Pondicherry	Mangalam-I	79.7391	11.9028	68.2
1973	Pondicherry	Pondicherry	Pondicherry	79.8349	11.9333	62
1974	Pondicherry	Pondicherry	Reddichavadi	79.827	11.9368	49.6
1975	Pondicherry	Pondicherry	VILLIANUR	79.7678	11.7665	49.6
1976	Punjab	Amritsar	Ajnala	74.758	31.846	55
1977	Punjab	Bhatinda	Balluana	74.7839	30.2237	425
1978	Punjab	Bhatinda	Bhagi Bandar	75.0697	30.0251	56
1979	Punjab	Bhatinda	Dyalpur Mirja	75.1318	30.4002	47

S.No.	State	District	Location	Long	Lat	NO3
1980	Punjab	Bhatinda	Ganga	74.8187	30.3676	121
1981	Punjab	Bhatinda	Gurusar	75.1052	29.9608	112
1982	Punjab	Bhatinda	Jajal	75.0298	29.9665	99
1983	Punjab	Bhatinda	Jassi Bhagwali	74.8145	30.0522	101
1984	Punjab	Bhatinda	Jhanduke	75.1453	30.1616	48
1985	Punjab	Bhatinda	Kale Bandar	75.0023	30.0789	56
1986	Punjab	Bhatinda	Kalyan sukha	75.1087	30.3743	293
1987	Punjab	Bhatinda	Kot Shamir	75.0104	30.1113	284
1988	Punjab	Bhatinda	Maiser Khanna	75.1791	30.1047	94
1989	Punjab	Bhatinda	Phullo Mithi	74.845	30.098	46
1990	Punjab	Bhatinda	Raike Kalan	74.6682	30.1282	120
1991	Punjab	Faridkot	Baja Khana	74.9772	30.4547	81
1992	Punjab	Faridkot	Deep singwala	74.4829	30.7426	100
1993	Punjab	Faridkot	Karir Wali	74.8273	30.4056	106
1994	Punjab	Faridkot	Killi	74.5461	30.7861	144
1995	Punjab	Faridkot	Kot Kapura	74.8192	30.5789	82
1996	Punjab	Faridkot	Mehmunna Sadiq	74.6381	30.6957	110
1997	Punjab	Faridkot	Mumara	74.5885	30.7935	150
1998	Punjab	Faridkot	Sadiq	74.5856	30.7088	200
1999	Punjab	Faridkot	Sher Singhwala	74.6259	30.6687	45
2000	Punjab	Faridkot	Sukhanwala	74.6394	30.6382	125
2001	Punjab	Fazilka	Abohar	74.1901	30.148	160
2002	Punjab	Fazilka	Alamgarh	74.1576	30.1269	98
2003	Punjab	Fazilka	Danewal Satkosi	74.0341	30.1773	130
2004	Punjab	Fazilka	Deepulana	74.1346	30.4607	89
2005	Punjab	Fazilka	Kauranwali	74.0561	30.3829	62
2006	Punjab	Fazilka	Sohangarh(Coloured Samples)	74.3892	30.6003	158
2007	Punjab	Firozpur	Ladhewala	74.3863	30.5347	90
2008	Punjab	Firozpur	Moharewala	74.5849	30.8287	180
2009	Punjab	Gurdaspur	Saidowal	75.519	31.98	145
2010	Punjab	Gurdaspur	SriHargobindpur	75.475	31.692	46
2011	Punjab	Hoshiarpur	Bhangala	75.609	32.025	70
2012	Punjab	Hoshiarpur	Nangal Bhaiala	75.708	31.908	90
2013	Punjab	Jalandhar	Billi Charmi	75.394	31.112	57
2014	Punjab	Jalandhar	Kartarpur	75.499	31.436	85
2015	Punjab	Jalandhar	Shahkot	75.33	31.079	70
2016	Punjab	Kapurthala	phagwara	75.779	31.229	64
2017	Punjab	Ludhiana	Chattar Singh Park	75.792	30.9	88
2018	Punjab	Ludhiana	Doraha	76.021	30.8	55
2019	Punjab	Ludhiana	Hallwara	75.638	30.725	50
2020	Punjab	Ludhiana	Maksudra	76.01	30.73	60
2021	Punjab	Ludhiana	P.A.U.Ludhiana	75.807	30.904	60
2022	Punjab	Mansa	Burj Bhalaika	75.2754	29.8426	50
2023	Punjab	Mansa	Raipur	75.2573	29.9041	150
2024	Punjab	Moga	Jaisinghwala	75.072	30.728	45
2025	Punjab	Moga	Nihalsinghwala	75.183	30.611	47
2026	Punjab	Muktsar	Balochkhara	74.4104	30.0816	53
2027	Punjab	Muktsar	Bhalaiana	74.7133	30.3301	1000
2028	Punjab	Muktsar	Doda	74.637	30.3816	500
2029	Punjab	Muktsar	Dohak	74.6009	30.6324	75
2030	Punjab	Muktsar	Kabarwala	74.4097	30.1931	61
2031	Punjab	Muktsar	Lambi	74.6136	30.061	52
2032	Punjab	Muktsar	Sheranwali	74.4644	30.0318	87
2033	Punjab	Nawanshahar	Rahon	76.136	31.057	140
2034	Punjab	Pathankot	Ghoh	75.663	32.329	50
2035	Punjab	Patiala	Bassma Pipla	76.728	30.46	100
2036	Punjab	Patiala	Dulladi	76.138	30.383	65

S.No.	State	District	Location	Long	Lat	NO3
2037	Punjab	Ropar	Ahemadpur	76.575	31	68
2038	Punjab	Sangrur	Baurhai Khurd	75.84	30.626	45
2039	Punjab	Sangrur	Ghanauri Kalan	75.77	30.41	49
2040	Punjab	Sangrur	Maler Kotla	75.9	30.525	84
2041	Punjab	Sas Nagar	Joli	76.9	30.55	91
2042	Punjab	Sas Nagar	Sawara	76.641	30.684	180
2043	Punjab	Taran Taran	Chabal	74.8	31.481	48
2044	Rajasthan	Ajmer	BOGLA	75.233	25.89	53
2045	Rajasthan	Ajmer	JHOPADIYAN	74.658	26.025	188
2046	Rajasthan	Ajmer	KANPUR1	74.867	26.4	90
2047	Rajasthan	Ajmer	KANPURA1	74.867	26.4	90
2048	Rajasthan	Ajmer	LAMANA	74.492	26.233	92
2049	Rajasthan	Ajmer	LUDIYANA	74.583	25.997	148
2050	Rajasthan	Ajmer	MAIDAYABADAYA	74.37	26.12	221
2051	Rajasthan	Ajmer	Mangaliyawas	74.508	26.277	60
2052	Rajasthan	Ajmer	MASUDA1	74.513	26.092	239
2053	Rajasthan	Ajmer	NARBADKHERA	74.283	26.05	95
2054	Rajasthan	Ajmer	TABIJI	74.617	26.363	70
2055	Rajasthan	Ajmer	TARAGARH	74.15	25.883	97
2056	Rajasthan	Alwar	Bairawas	76.399	27.461	60
2057	Rajasthan	Alwar	BANSUR	76.356	27.692	55
2058	Rajasthan	Alwar	LACHMANGARH	76.86	27.35	90
2059	Rajasthan	Alwar	Mandawar	76.5455	27.8696	95
2060	Rajasthan	Alwar	Neemrana	76.388	27.999	65
2061	Rajasthan	Alwar	NIMLI	76.933	27.833	80
2062	Rajasthan	Alwar	TAPUKARA	76.835	28.11	208
2063	Rajasthan	Alwar	Tehla	76.4	27.2375	220
2064	Rajasthan	Alwar	TIJARA1	76.864	27.933	850
2065	Rajasthan	Alwar	Todi Ka Bas	76.328	27.118	90
2066	Rajasthan	Banswara	Arthuna1	74.1	23.5	47
2067	Rajasthan	Banswara	Barodiya	74.35	23.417	81
2068	Rajasthan	Banswara	Borwat	74.384	23.509	51
2069	Rajasthan	Banswara	Charakni	74.38	23.313	48
2070	Rajasthan	Banswara	CHHAJA	74.0586	23.4333	65
2071	Rajasthan	Banswara	Gangar Talai	74.1698	23.2573	68
2072	Rajasthan	Banswara	Kharod Chatra	74.29	23.22	302
2073	Rajasthan	Banswara	Padla Barora	74.519	23.536	88
2074	Rajasthan	Banswara	Samla Sahar	74.25	23.21	85
2075	Rajasthan	Baran	BHANWARGARH	76.794	25.091	58
2076	Rajasthan	Baran	Chhabra_GWD	76.843	24.668	54
2077	Rajasthan	Baran	CHHIPA BAROD	76.732	24.594	56
2078	Rajasthan	Baran	HARNAUDA	76.7	24.436	54
2079	Rajasthan	Baran	Kasba Thana	77.358	25.208	100
2080	Rajasthan	Baran	UDPURIA	76.329	25.3	330
2081	Rajasthan	Barmer	BHOGINJI KA MEETHA	72.1257	25.5149	200
2082	Rajasthan	Barmer	CHAUHTAN	71.075	25.475	276
2083	Rajasthan	Barmer	DERASAR	71.163	25.776	94
2084	Rajasthan	Barmer	DHANAU	71.1339	25.2343	69
2085	Rajasthan	Barmer	DHORIMANA	71.4352	25.2344	104
2086	Rajasthan	Barmer	GUDAMALANI	71.6988	25.214	392
2087	Rajasthan	Barmer	Gujrokabera	71.332	26.2018	69
2088	Rajasthan	Barmer	KERALA	71.9016	25.997	143
2089	Rajasthan	Barmer	KHARA MAHECHA	72.0265	25.5103	70
2090	Rajasthan	Barmer	KumarokiDhani	72.12	26.2	89
2091	Rajasthan	Barmer	LOONAKALAN	71.9829	25.4481	81
2092	Rajasthan	Barmer	Pataudi Block HQ	72.2714	26.0823	125
2093	Rajasthan	Barmer	RAMSAR	70.8719	25.7303	139

S.No.	State	District	Location	Long	Lat	NO3
2094	Rajasthan	Barmer	SANAWARA	71.4	25.48	84
2095	Rajasthan	Barmer	Santara	71.968	25.998	277
2096	Rajasthan	Barmer	SANWLOOR	71.2333	25.5858	220
2097	Rajasthan	Barmer	SASIO KA KUA	71.4125	25.7042	142
2098	Rajasthan	Barmer	SAWAU PADAM SINGH	71.8067	26.1503	233
2099	Rajasthan	Barmer	Sedwa	71.128	25.067	80
2100	Rajasthan	Barmer	SIHANI	71.083	25.755	89
2101	Rajasthan	Barmer	Siwana Block HQ	72.4281	25.6636	140
2102	Rajasthan	Barmer	SIYAGATALA	70.8653	25.3375	378
2103	Rajasthan	Barmer	TARLA	71.217	24.836	273
2104	Rajasthan	Barmer	THOB	72.358	26.05	320
2105	Rajasthan	Barmer	Thumbli	72.4886	26.2036	260
2106	Rajasthan	Bharatpur	DAHINAGAON	77.492	26.996	320
2107	Rajasthan	Bharatpur	DEEG1	77.333	27.467	65
2108	Rajasthan	Bharatpur	Gopalgarh	77.0633	27.6547	98
2109	Rajasthan	Bharatpur	GULPURA	77.125	27.533	130
2110	Rajasthan	Bharatpur	Kaman	77.2697	27.6572	115
2111	Rajasthan	Bharatpur	KHANUA	77.55	27.033	62
2112	Rajasthan	Bharatpur	Ludhawai_GWD	77.395	27.175	55
2113	Rajasthan	Bharatpur	MANDHERA	77.353	27.395	240
2114	Rajasthan	Bharatpur	NADBAI	77.213	27.208	320
2115	Rajasthan	Bharatpur	Roopwas	77.5908	26.9936	140
2116	Rajasthan	Bharatpur	Salabad	77.315	26.9786	92
2117	Rajasthan	Bharatpur	Sewar	77.4403	27.1822	70
2118	Rajasthan	Bhilwara	BADNOR	74.283	25.833	137
2119	Rajasthan	Bhilwara	Bhagwanpura	75.055	25.469	59
2120	Rajasthan	Bhilwara	BORANI	75.333	25.683	87
2121	Rajasthan	Bhilwara	GANGAPUR1	74.26	25.217	148
2122	Rajasthan	Bhilwara	GULABPURA	74.67	25.9	100
2123	Rajasthan	Bhilwara	KOTARI	74.892	25.397	63
2124	Rajasthan	Bhilwara	Mahendragarh	74.3676	25.2614	46
2125	Rajasthan	Bhilwara	malas	74.3294	25.5242	157
2126	Rajasthan	Bhilwara	Mandal	74.5693	25.4533	91
2127	Rajasthan	Bhilwara	MANDALGARH1	75.094	25.183	83
2128	Rajasthan	Bhilwara	MANGTALA	75.2975	25.3475	69
2129	Rajasthan	Bhilwara	PAROLI	75.092	25.518	55
2130	Rajasthan	Bhilwara	POTLAN	74.2174	25.1368	287
2131	Rajasthan	Bhilwara	RAILA ROAD	74.6	25.633	112
2132	Rajasthan	Bhilwara	Raipur	74.161	25.404	128
2133	Rajasthan	Bhilwara	Rampuriya_Pz	75.3288	25.2935	67
2134	Rajasthan	Bhilwara	SAWAIPUR	74.867	25.307	226
2135	Rajasthan	Bikaner	BADERAN	73.764	28.701	60
2136	Rajasthan	Bikaner	BAJJU	72.508	27.933	60
2137	Rajasthan	Bikaner	Chhattargarh	73.1333	28.6667	78
2138	Rajasthan	Bikaner	GODU	72.297	27.992	70
2139	Rajasthan	Bikaner	HARIASAR	73.811	28.576	120
2140	Rajasthan	Bikaner	kaloo	73.8853	28.3889	160
2141	Rajasthan	Bikaner	Karmisar	73.2803	28.0006	402
2142	Rajasthan	Bikaner	Khirera	73.558	28.479	450
2143	Rajasthan	Bikaner	KOLAYAT	72.954	27.842	310
2144	Rajasthan	Bikaner	Lakhansar	73.35	28.87	115
2145	Rajasthan	Bikaner	LAKHASAR2	73.871	28.096	70
2146	Rajasthan	Bikaner	LAKHUSAR	73.192	28.317	240
2147	Rajasthan	Bikaner	MANARIA	73.772	28.758	480
2148	Rajasthan	Bikaner	Nokha	73.4672	27.5525	80
2149	Rajasthan	Bikaner	Panchoo	73.2122	27.5122	55
2150	Rajasthan	Bikaner	SATTASAR	73.192	28.592	60

S.No.	State	District	Location	Long	Lat	NO3
2151	Rajasthan	Bundi	DELUNDA	75.867	25.471	227
2152	Rajasthan	Bundi	LAKHERI	76.183	25.667	90
2153	Rajasthan	Chittaurgarh	Mungana	74.27	24.88	67
2154	Rajasthan	Chittaurgarh	Purohitokasavat	74.52	24.94	58
2155	Rajasthan	Chittaurgarh	BANSEN	74.45	24.727	115
2156	Rajasthan	Chittaurgarh	GANGRAR1	74.633	25.05	60
2157	Rajasthan	Chittaurgarh	KAPASAN1	74.308	24.861	266
2158	Rajasthan	Chittaurgarh	Mahuda	74.354	24.357	61
2159	Rajasthan	Churu	Aspalsar	74.5044	28.5769	260
2160	Rajasthan	Churu	BHOJASAR	74.542	27.972	550
2161	Rajasthan	Churu	BIDASAR	74.283	27.839	742
2162	Rajasthan	Churu	BINASAR	74.875	28.263	90
2163	Rajasthan	Churu	Churu	74.9275	28.2955	83
2164	Rajasthan	Churu	DADREWA	75.233	28.669	205
2165	Rajasthan	Churu	DUDWA KHARA	75.079	28.471	800
2166	Rajasthan	Churu	GULERIYA	74.419	27.738	210
2167	Rajasthan	Churu	MEHRASAR	74.538	28.357	295
2168	Rajasthan	Churu	MELUSAR	74.738	28.504	120
2169	Rajasthan	Churu	NEEMA	75.4722	28.4667	250
2170	Rajasthan	Churu	Parihara	74.5619	27.9244	320
2171	Rajasthan	Churu	RAJGARH1	75.375	28.633	700
2172	Rajasthan	Churu	RAMPURA	74.863	28.467	285
2173	Rajasthan	Churu	Ratangarh	74.6039	28.0561	280
2174	Rajasthan	Churu	SARDARSHAHAR	74.486	28.439	200
2175	Rajasthan	Churu	SIRSALA	75.131	28.433	950
2176	Rajasthan	Churu	Soniyasar	74.0208	27.7631	95
2177	Rajasthan	Churu	Sujangarh	74.4808	27.7069	850
2178	Rajasthan	Churu	Taranagar	75.0342	28.6879	150
2179	Rajasthan	Dausa	Bandikui	76.5683	27.0397	200
2180	Rajasthan	Dausa	DAUSA1	76.326	26.898	100
2181	Rajasthan	Dausa	Jasuta	76.333	26.967	150
2182	Rajasthan	Dausa	LAWAN1	76.217	26.783	69
2183	Rajasthan	Dausa	Sikrai	76.6892	26.9192	47
2184	Rajasthan	Dhaulpur	Aathmeel	77.8019	26.6483	140
2185	Rajasthan	Dhaulpur	Angai	77.4731	26.605	49
2186	Rajasthan	Dhaulpur	Bari1	77.6106	26.6453	60
2187	Rajasthan	Dhaulpur	Dhaulpur	77.8917	26.7	240
2188	Rajasthan	Dhaulpur	Mangraul	77.9583	26.8167	117
2189	Rajasthan	Dhaulpur	Saipau	77.7464	26.8217	135
2190	Rajasthan	Dungarpur	KUA	73.913	23.467	48
2191	Rajasthan	Dungarpur	Ramgarh2	73.967	23.925	132
2192	Rajasthan	Ganganagar	ANUPGARH1	73.219	29.191	288
2193	Rajasthan	Ganganagar	Birdhwal1	73.919	29.117	240
2194	Rajasthan	Ganganagar	Ganganagar	73.8517	29.9087	54
2195	Rajasthan	Ganganagar	PIPERAN	73.9	29.248	60
2196	Rajasthan	Ganganagar	RAISINGHNAGAR	73.45	29.542	107
2197	Rajasthan	Ganganagar	TATARSAR	73.733	29.808	99
2198	Rajasthan	Hanumangarh	BHUKARKA	74.75	29.233	70
2199	Rajasthan	Hanumangarh	BISRASAR	74.278	28.867	62
2200	Rajasthan	Hanumangarh	BOLANWALI	74.41	29.838	90
2201	Rajasthan	Hanumangarh	DUDHAL	74.133	28.908	320
2202	Rajasthan	Hanumangarh	DUNGRANA	75.097	29.014	300
2203	Rajasthan	Hanumangarh	GANDEHALI	74.533	29.217	240
2204	Rajasthan	Hanumangarh	Hanumangarh Rau	74.2833	29.6167	60
2205	Rajasthan	Hanumangarh	MUNSARI	75.033	29.1	700
2206	Rajasthan	Hanumangarh	PURABSAR	74.283	29.033	123
2207	Rajasthan	Hanumangarh	RAWATSAR	74.414	29.253	150

S.No.	State	District	Location	Long	Lat	NO3
2208	Rajasthan	Hanumangarh	Tibi	74.5056	29.5604	100
2209	Rajasthan	Jaipur	Bhojpura	75.614	26.622	55
2210	Rajasthan	Jaipur	Chakwara	75.513	26.606	69
2211	Rajasthan	Jaipur	Chittora	75.702	26.638	77
2212	Rajasthan	Jaipur	DAWACH	75.754	26.567	93
2213	Rajasthan	Jaipur	Didwata	75.73	26.494	330
2214	Rajasthan	Jaipur	Jaisingpur Khor	75.8806	26.9448	150
2215	Rajasthan	Jaipur	Kotputli	76.1917	27.7044	50
2216	Rajasthan	Jaipur	Ladana	75.586	26.651	80
2217	Rajasthan	Jaipur	Lasariya	75.509	26.557	156
2218	Rajasthan	Jaipur	Madhorajpur	75.656	26.577	103
2219	Rajasthan	Jaipur	Majhi Renwal	75.683	26.696	270
2220	Rajasthan	Jaipur	MANGARWARA	75.278	26.61	334
2221	Rajasthan	Jaipur	MOZMABAD	75.363	26.683	58
2222	Rajasthan	Jaipur	NASNOTA	75.443	26.8	52
2223	Rajasthan	Jaipur	Nemeda	75.514	26.504	165
2224	Rajasthan	Jaipur	PALLUKHURD	75.325	26.736	311
2225	Rajasthan	Jaipur	Paota	76.0766	27.5846	150
2226	Rajasthan	Jaipur	Parun	75.607	26.506	150
2227	Rajasthan	Jaipur	Rajnota	76.1922	27.5969	50
2228	Rajasthan	Jaipur	Sambhar	75.22	26.906	169
2229	Rajasthan	Jaipur	SIROHIKHURD	75.15	26.792	54
2230	Rajasthan	Jaipur	Tickel	75.502	26.706	62
2231	Rajasthan	Jaipur	Tootoli	75.7994	26.6342	145
2232	Rajasthan	Jaisalmer	BHAINSARA	71.492	26.631	175
2233	Rajasthan	Jaisalmer	KALEWA	71.904	26.806	103
2234	Rajasthan	Jaisalmer	LAWAN	72.05	26.872	191
2235	Rajasthan	Jaisalmer	LUNA KALAN	71.571	26.623	76
2236	Rajasthan	Jaisalmer	MOOLSAGAR	70.835	26.913	62
2237	Rajasthan	Jaisalmer	RAJGARH1	71.545	26.538	128
2238	Rajasthan	Jaisalmer	Ranau	70.45	27.5933	78
2239	Rajasthan	Jaisalmer	SADEWALA	70.244	27.635	252
2240	Rajasthan	Jaisalmer	Sankara	71.5818	26.7277	319
2241	Rajasthan	Jaisalmer	SRIBHADRIA	71.55	27.083	46
2242	Rajasthan	Jaisalmer	TANOT	70.367	27.8	97
2243	Rajasthan	Jalore	BHAGALBHIM	72.2227	25.0188	94
2244	Rajasthan	Jalore	BHAGLI	72.5958	25.2786	107
2245	Rajasthan	Jalore	DOONGRI	71.408	24.942	168
2246	Rajasthan	Jalore	HALIVAV	71.5939	24.9911	146
2247	Rajasthan	Jalore	JALORE	72.6306	25.3346	545
2248	Rajasthan	Jalore	KAGMALA	72.3	24.8661	130
2249	Rajasthan	Jalore	MAITRIWARA	72.1094	24.7094	48
2250	Rajasthan	Jalore	NIMLA	72.866	25.531	66
2251	Rajasthan	Jalore	RANIWARA	72.2194	24.7716	79
2252	Rajasthan	Jalore	SANCHORE	71.7946	24.7585	118
2253	Rajasthan	Jhalawar	AKLERA	76.561	24.413	48
2254	Rajasthan	Jhalawar	AKTASA	76.303	24.488	65
2255	Rajasthan	Jhalawar	ASALPUR	76.504	24.271	90
2256	Rajasthan	Jhalawar	BINDA	76.187	24.411	59
2257	Rajasthan	Jhalawar	DAG1	75.835	23.949	45
2258	Rajasthan	Jhalawar	GAGRON	76.189	24.661	65
2259	Rajasthan	Jhalawar	GAJWARA	76.773	24.34	95
2260	Rajasthan	Jhalawar	GUNAVI	75.883	23.995	65
2261	Rajasthan	Jhalawar	GURARIYA JOGA	75.836	24.367	145
2262	Rajasthan	Jhalawar	MANDAWAR1	76.258	24.598	84
2263	Rajasthan	Jhalawar	SAREDI	76.672	24.35	99
2264	Rajasthan	Jhunjhunu	Alsisar	75.2931	28.3037	52

S.No.	State	District	Location	Long	Lat	NO3
2265	Rajasthan	Jhunjhunu	Birmi	75.1778	28.2	260
2266	Rajasthan	Jhunjhunu	Chirawa	75.6504	28.2309	48
2267	Rajasthan	Jhunjhunu	Jhunjhunu	75.3852	28.1135	75
2268	Rajasthan	Jhunjhunu	Math	75.454	28.175	105
2269	Rajasthan	Jhunjhunu	MUKUNDGARH	75.217	27.954	62
2270	Rajasthan	Jhunjhunu	Nawalgarh	75.2533	27.8472	220
2271	Rajasthan	Jodhpur	Balesar	72.4908	26.4023	135
2272	Rajasthan	Jodhpur	BENAN	73.421	26.317	380
2273	Rajasthan	Jodhpur	Bhandu kalan Uranium Hotspot	72.9015	26.1294	200
2274	Rajasthan	Jodhpur	Bhavi	73.6067	26.2317	75
2275	Rajasthan	Jodhpur	Bhopalgarh Block HQ	73.4984	26.6475	260
2276	Rajasthan	Jodhpur	Binawas Uranium Hotspot	73.3782	26.2907	80
2277	Rajasthan	Jodhpur	Bisalpur	73.314	26.233	140
2278	Rajasthan	Jodhpur	Chabon ki dhani Block HQ	73.1671	26.6314	80
2279	Rajasthan	Jodhpur	Dangiyawas	73.2829	26.264	290
2280	Rajasthan	Jodhpur	DEVATRA	73.378	26.51	85
2281	Rajasthan	Jodhpur	DHAWA	72.742	26.058	110
2282	Rajasthan	Jodhpur	Gangani	73.212	26.51	610
2283	Rajasthan	Jodhpur	Hemnagar	72.7817	26.2961	120
2284	Rajasthan	Jodhpur	KARANI	72.825	26.272	115
2285	Rajasthan	Jodhpur	Khatawas Uranium Hotspot	72.8027	26.1193	70
2286	Rajasthan	Jodhpur	Kheri Salwa Uranium Hot spot	73.3658	26.4352	220
2287	Rajasthan	Jodhpur	KHUDALA	72.832	26.151	180
2288	Rajasthan	Jodhpur	Kukunda Uranium Hotspot	73.3223	26.346	700
2289	Rajasthan	Jodhpur	LohawatBisna Bass	72.5883	26.9841	66
2290	Rajasthan	Jodhpur	MOGRA	73.033	26.117	300
2291	Rajasthan	Jodhpur	Nahar Singh Nagar	72.286	26.39	64
2292	Rajasthan	Jodhpur	Olvi	73.458	26.233	130
2293	Rajasthan	Jodhpur	Osian	72.8964	26.7411	45
2294	Rajasthan	Jodhpur	Pipad City	73.5497	26.3792	240
2295	Rajasthan	Jodhpur	Rajwa	72.84	26.33	443
2296	Rajasthan	Jodhpur	Ramdawas	73.3658	26.3658	280
2297	Rajasthan	Jodhpur	RARON KI DHANI	72.775	26.194	190
2298	Rajasthan	Jodhpur	Samdari Block HQ	72.5756	26.8488	80
2299	Rajasthan	Jodhpur	SArgiya Kallan	73.54	26.54	90
2300	Rajasthan	Jodhpur	Soyla	73.3375	26.8208	190
2301	Rajasthan	Jodhpur	Tinwari	72.8836	26.5447	48
2302	Rajasthan	Karauli	BADH KAMLA	76.925	26.693	250
2303	Rajasthan	Karauli	GURLA1	77.004	26.642	65
2304	Rajasthan	Karauli	ISLAMPUR	77.017	26.7	270
2305	Rajasthan	Karauli	Karauli	77.0172	26.5014	250
2306	Rajasthan	Karauli	KARSAI	76.933	26.425	1350
2307	Rajasthan	Karauli	NAROLI DANG	76.683	26.325	160
2308	Rajasthan	Karauli	SAHAR1	76.711	26.608	1450
2309	Rajasthan	Karauli	SAPOTRA1	76.77	26.279	65
2310	Rajasthan	Kota	BAKANI	75.9067	25.0408	67
2311	Rajasthan	Kota	BHAWANIMANDI	76.4347	25.4458	89
2312	Rajasthan	Nagaur	Bagot	74.5911	26.8131	500
2313	Rajasthan	Nagaur	CHOSLI	74.255	26.93	250
2314	Rajasthan	Nagaur	Choti khatu	74.3458	27.1542	480
2315	Rajasthan	Nagaur	Dagawas Block HQ	74.058	26.6458	60
2316	Rajasthan	Nagaur	Datau	74.4567	27.4906	800
2317	Rajasthan	Nagaur	Jayal Block HQ	74.1863	27.2186	60
2318	Rajasthan	Nagaur	Koliya	74.4833	27.3458	90
2319	Rajasthan	Nagaur	Kuchaman Block HQ	74.8591	27.1483	1350
2320	Rajasthan	Nagaur	Ladnu Block HQ	74.3908	27.6296	520
2321	Rajasthan	Nagaur	Makrana	74.7574	27.0256	80

S.No.	State	District	Location	Long	Lat	NO3
2322	Rajasthan	Nagaur	Mundawa Block HQ	73.82	27.058	198
2323	Rajasthan	Nagaur	Nagaur	73.75	27.1833	380
2324	Rajasthan	Nagaur	Nawa	75.0021	27.0329	90
2325	Rajasthan	Nagaur	RAGHUNATHPURA	74.517	27.375	102
2326	Rajasthan	Nagaur	SANWARD	74.517	27.517	270
2327	Rajasthan	Nagaur	Singhana	74.5125	27.4753	130
2328	Rajasthan	Pali	BALI	73.2832	25.1911	180
2329	Rajasthan	Pali	Balwana	73.159	25.114	217
2330	Rajasthan	Pali	DESURI	73.5582	25.2763	60
2331	Rajasthan	Pali	GUNDOJ	73.313	25.608	1340
2332	Rajasthan	Pali	Marwar Junction Block HQ	73.601	25.723	120
2333	Rajasthan	Pali	Prathvipura	73.8167	26.2	90
2334	Rajasthan	Pali	VAED	72.967	25.724	340
2335	Rajasthan	Pratapgarh	Arnod_Pz	74.813	23.9	76
2336	Rajasthan	Pratapgarh	Choti Sadri	74.7	24.386	62
2337	Rajasthan	Pratapgarh	Moheda	74.858	23.775	99
2338	Rajasthan	Pratapgarh	Mokhampura	74.875	24.024	60
2339	Rajasthan	Pratapgarh	Mungana	74.435	23.96	73
2340	Rajasthan	Pratapgarh	Peepalkhoont	74.567	23.796	61
2341	Rajasthan	Rajsamand	GAVARDI	74.1	24.904	47
2342	Rajasthan	Rajsamand	GHATA	74.183	25.783	164
2343	Rajasthan	Rajsamand	KHAMNOR1	73.733	24.917	68
2344	Rajasthan	Rajsamand	Kumbhalgarh	73.5739	25.135	54
2345	Rajasthan	Rajsamand	RAILMAGRA1	74.117	25.033	55
2346	Rajasthan	Rajsamand	RAJSAMAND	73.883	25.067	78
2347	Rajasthan	Sawai Madhopur	BAMNAWAS	76.561	26.55	100
2348	Rajasthan	Sawai Madhopur	BHADOTI	76.386	26.253	59
2349	Rajasthan	Sawai Madhopur	GANGAPUR2	76.733	26.483	150
2350	Rajasthan	Sawai Madhopur	KUSHTALA	76.267	25.967	200
2351	Rajasthan	Sawai Madhopur	RANTHAMBOR	76.458	26.017	300
2352	Rajasthan	Sawai Madhopur	SEWA	76.837	26.525	80
2353	Rajasthan	Sawai Madhopur	TOND	76.397	26.367	55
2354	Rajasthan	Sawai Madhopur	TONK	76.2542	26.3542	108
2355	Rajasthan	Sikar	Ajitgarh	75.817	27.418	70
2356	Rajasthan	Sikar	Khandela	75.4992	27.5978	60
2357	Rajasthan	Sikar	Neem Ka Thana	75.794	27.7391	170
2358	Rajasthan	Sikar	PATAN	75.983	27.8	320
2359	Rajasthan	Sikar	Ramgarh	75.1822	27.2572	280
2360	Rajasthan	Sirohi	GULABGANJ	72.675	24.675	92
2361	Rajasthan	Sirohi	JEERAWAL	72.4917	24.6389	63
2362	Rajasthan	Sirohi	MANPUR	72.7592	24.5044	61
2363	Rajasthan	Sirohi	MOUNT ABU	72.7102	24.5918	48
2364	Rajasthan	Sirohi	MUNGTHALA	72.6833	24.4833	178
2365	Rajasthan	Sirohi	SHEOGANJ	73.0451	25.145	270
2366	Rajasthan	Sirohi	VIRWARA	72.988	24.841	95
2367	Rajasthan	Tonk	BANTHOLI	75.567	25.883	155
2368	Rajasthan	Tonk	DEWAL1	75.188	26.238	93
2369	Rajasthan	Tonk	JAINAGAR	75.884	25.933	85
2370	Rajasthan	Tonk	Sop1	75.4889	26.0225	52
2371	Rajasthan	Tonk	TODARAISINGH1	75.489	26.023	105
2372	Rajasthan	Udaipur	Mavli1	73.983	24.783	114
2373	Rajasthan	Udaipur	ARAMPUR	74.417	24.251	140
2374	Rajasthan	Udaipur	BHOYANA	73.917	24.717	210
2375	Rajasthan	Udaipur	DINGRI	73.867	24.217	523
2376	Rajasthan	Udaipur	Ghuri Mari	73.388	24.306	104
2377	Rajasthan	Udaipur	JASWANTGARH	73.468	24.8	59
2378	Rajasthan	Udaipur	JHADOL	73.4963	24.4138	99

S.No.	State	District	Location	Long	Lat	NO3
2379	Rajasthan	Udaipur	KALAYANPURA	73.758	24.001	243
2380	Rajasthan	Udaipur	KHERODA	74.059	24.58	64
2381	Rajasthan	Udaipur	KURABAR	73.992	24.448	62
2382	Rajasthan	Udaipur	LASADIYA	74.2391	24.2652	90
2383	Tamil Nadu	Ariyalur	Kiharasanur	78.9319	11.0114	198
2384	Tamil Nadu	Ariyalur	Kilpazhavur	79.0653	11.0436	155
2385	Tamil Nadu	Ariyalur	Oliyur EW	79.3186	11.3979	69
2386	Tamil Nadu	Ariyalur	Papakudi	79.49	11.2855	66
2387	Tamil Nadu	Ariyalur	Periyathukurichi	79.35	11.4104	56
2388	Tamil Nadu	Chennai	Vepery	80.2708	13.0833	142
2389	Tamil Nadu	Coimbatore	Annur1	77.1083	11.2333	178
2390	Tamil Nadu	Coimbatore	Chinnaripalayam	77.0917	10.7292	162
2391	Tamil Nadu	Coimbatore	Coimbatore Taluk Office	76.9711	11.0017	57
2392	Tamil Nadu	Coimbatore	Ganesapuram	77.0575	11.1758	76
2393	Tamil Nadu	Coimbatore	Kallampalayam pz	77.2833	11.03	227
2394	Tamil Nadu	Coimbatore	Kattampatty pz	77.1425	10.8053	199
2395	Tamil Nadu	Coimbatore	Kinathukadavu	77.0292	10.7333	70
2396	Tamil Nadu	Coimbatore	Kovilvazhi IV	77.3889	11.0583	116
2397	Tamil Nadu	Coimbatore	Kuniamuthur	76.9167	10.9667	104
2398	Tamil Nadu	Coimbatore	Kunnakalpalayam pz	77.3272	11.0456	98
2399	Tamil Nadu	Coimbatore	Madukkarai-PZ	76.9667	10.9083	93
2400	Tamil Nadu	Coimbatore	P.N.palayam	76.9922	11.2069	137
2401	Tamil Nadu	Coimbatore	Periya Negamam pz	77.1014	10.7403	213
2402	Tamil Nadu	Coimbatore	Podanur1	76.9833	10.9667	86
2403	Tamil Nadu	Coimbatore	Sarkar samakulam pz	77.0333	11.1333	104
2404	Tamil Nadu	Coimbatore	Thondamuthur	76.8333	10.9833	83
2405	Tamil Nadu	Coimbatore	Vadavalli	76.9083	11.025	178
2406	Tamil Nadu	Cuddalore	Ammeri - Thoppulikuppam (Kilmungiladi)	79.4578	11.5561	62
2407	Tamil Nadu	Cuddalore	Anathanampettai	79.6351	11.6068	124
2408	Tamil Nadu	Cuddalore	Arasadikuppam	79.6614	11.6147	81
2409	Tamil Nadu	Cuddalore	Chidhambaram Annamalaiagar	79.7072	11.3919	62
2410	Tamil Nadu	Cuddalore	Gandhinagar-NLC arch gate	79.554	11.6177	52
2411	Tamil Nadu	Cuddalore	Iruppu ii	79.6325	11.5036	58
2412	Tamil Nadu	Cuddalore	Kattumannakudi	79.5517	11.2872	68
2413	Tamil Nadu	Cuddalore	Kattusagai(n)	79.6534	11.5228	68
2414	Tamil Nadu	Cuddalore	Kattuvegakollai	79.6392	11.6475	68
2415	Tamil Nadu	Cuddalore	Keelpuvanikuppam	79.7191	11.6013	56
2416	Tamil Nadu	Cuddalore	Komaratchi	79.8072	11.5514	74
2417	Tamil Nadu	Cuddalore	Kopuvanur	79.1378	11.6156	68
2418	Tamil Nadu	Cuddalore	Kundiamallur	79.6517	11.5269	74
2419	Tamil Nadu	Cuddalore	Manjakuppam	79.7647	11.7644	51
2420	Tamil Nadu	Cuddalore	Nadiyapattu	79.4041	11.6647	50
2421	Tamil Nadu	Cuddalore	Palayamkottai EW	79.5722	11.4161	74
2422	Tamil Nadu	Cuddalore	Reddipalayam	79.53	11.5371	130
2423	Tamil Nadu	Cuddalore	Sengalpalayam-I	79.5422	11.4324	87
2424	Tamil Nadu	Cuddalore	Srinivasapuram	79.6335	11.5839	50
2425	Tamil Nadu	Cuddalore	Theerthangari EW	79.5563	11.5604	74
2426	Tamil Nadu	Cuddalore	tiruchchopuram	79.7416	11.6164	68
2427	Tamil Nadu	Cuddalore	Vadalur EW	79.8844	11.5375	62
2428	Tamil Nadu	Cuddalore	Vanathirayapuram I	79.3347	11.5177	50
2429	Tamil Nadu	Cuddalore	Vegakollai	79.5289	11.6758	74
2430	Tamil Nadu	Dharmapuri	A.Pallipatti	78.4017	11.9403	199
2431	Tamil Nadu	Dharmapuri	A.Pallipatti	78.4017	11.9403	199
2432	Tamil Nadu	Dharmapuri	Athikarapatti	78.3909	11.934	55
2433	Tamil Nadu	Dharmapuri	Athikarapatti	78.3909	11.934	55
2434	Tamil Nadu	Dharmapuri	Bommidimalapuram	78.25	12	147

S.No.	State	District	Location	Long	Lat	NO3
2435	Tamil Nadu	Dharmapuri	Bommidimalapurm	78.25	12	147
2436	Tamil Nadu	Dharmapuri	Boothanatham	78.4688	11.9508	62
2437	Tamil Nadu	Dharmapuri	Boothanatham	78.4688	11.9508	62
2438	Tamil Nadu	Dharmapuri	Dharmapuri2	78.1708	12.1375	80
2439	Tamil Nadu	Dharmapuri	Dharmapuri2	78.1708	12.1375	80
2440	Tamil Nadu	Dharmapuri	Echambadi dw	78.4942	12.1128	262
2441	Tamil Nadu	Dharmapuri	Echambadi dw	78.4942	12.1128	262
2442	Tamil Nadu	Dharmapuri	Harur2	78.4833	12.0514	62
2443	Tamil Nadu	Dharmapuri	Harur2	78.4833	12.0514	62
2444	Tamil Nadu	Dharmapuri	Indoor	78.0583	12.1333	160
2445	Tamil Nadu	Dharmapuri	Indoor	78.0583	12.1333	160
2446	Tamil Nadu	Dharmapuri	Kottapatti Pz	78.6717	11.985	58
2447	Tamil Nadu	Dharmapuri	Kottapatti Pz	78.6717	11.985	58
2448	Tamil Nadu	Dharmapuri	Maniyampadi	78.2847	12.1246	52
2449	Tamil Nadu	Dharmapuri	Maniyampadi	78.2847	12.1246	52
2450	Tamil Nadu	Dharmapuri	Morappur dw	78.3989	12.1247	76
2451	Tamil Nadu	Dharmapuri	Morappur dw	78.3989	12.1247	76
2452	Tamil Nadu	Dharmapuri	Mukkareddipatti	78.4167	11.9667	61
2453	Tamil Nadu	Dharmapuri	Mukkareddipatti	78.4167	11.9667	61
2454	Tamil Nadu	Dharmapuri	Nagadasampatti	77.9833	12.1333	198
2455	Tamil Nadu	Dharmapuri	Nagadasampatti	77.9833	12.1333	198
2456	Tamil Nadu	Dharmapuri	Odasalapatti	78.2917	12.1417	67
2457	Tamil Nadu	Dharmapuri	Odasalapatti	78.2917	12.1417	67
2458	Tamil Nadu	Dharmapuri	Odasalapatti x road	78.2844	12.1431	157
2459	Tamil Nadu	Dharmapuri	Odasalapatti x road	78.2844	12.1431	157
2460	Tamil Nadu	Dharmapuri	Sillarahalli	78.2806	12.0525	336
2461	Tamil Nadu	Dharmapuri	Sillarahalli	78.2806	12.0525	336
2462	Tamil Nadu	Dharmapuri	Sittilingiri	78.6212	11.9098	49
2463	Tamil Nadu	Dharmapuri	Sittilingiri	78.6212	11.9098	49
2464	Tamil Nadu	Dharmapuri	Thirthamalai DW	78.5892	12.1017	162
2465	Tamil Nadu	Dharmapuri	Thirthamalai DW	78.5892	12.1017	162
2466	Tamil Nadu	Dindigul	Chattrapatti	77.6583	10.4667	275
2467	Tamil Nadu	Dindigul	Chellamantadi	78.0025	10.4072	157
2468	Tamil Nadu	Dindigul	Chitterivu pz	77.7708	10.2378	289
2469	Tamil Nadu	Dindigul	Guzilamparai	78.1156	10.6806	152
2470	Tamil Nadu	Dindigul	Kakkinapatti	77.9922	10.6714	107
2471	Tamil Nadu	Dindigul	Kallimandiam	77.6944	10.5833	106
2472	Tamil Nadu	Dindigul	Kanakkanpatti	77.5667	10.475	204
2473	Tamil Nadu	Dindigul	Muthampattipalayam	78.1392	10.7272	134
2474	Tamil Nadu	Dindigul	Natham1	78.2472	10.2222	361
2475	Tamil Nadu	Dindigul	Nattam	78.2333	10.2328	233
2476	Tamil Nadu	Dindigul	Oddanchatram1	77.7528	10.4908	207
2477	Tamil Nadu	Dindigul	Oodanchatram	77.7542	10.4875	198
2478	Tamil Nadu	Dindigul	P.Alagapuri	77.9756	10.5983	100
2479	Tamil Nadu	Dindigul	Palakanthu	77.8056	10.4658	82
2480	Tamil Nadu	Dindigul	Paraipatti	77.975	10.3583	282
2481	Tamil Nadu	Dindigul	Pudu Ettama Nayakar Patti	77.7061	10.4619	117
2482	Tamil Nadu	Dindigul	R.Pudukottai	78.0303	10.3646	76
2483	Tamil Nadu	Dindigul	Reddiarchatram	77.8611	10.4167	79
2484	Tamil Nadu	Dindigul	Servaikaranpatti	78.0917	10.7472	64
2485	Tamil Nadu	Dindigul	Thamaraipadi	78.0453	10.4053	241
2486	Tamil Nadu	Dindigul	Thoppampatti	77.5269	10.59	226
2487	Tamil Nadu	Dindigul	Thumbalapatti	77.5208	10.5333	178
2488	Tamil Nadu	Dindigul	Vadamadurai	78.1	10.3583	87
2489	Tamil Nadu	Dindigul	Vadamadurai pz	78.0612	10.263	107
2490	Tamil Nadu	Dindigul	Vaivesapuram	78.072	10.5484	100
2491	Tamil Nadu	Dindigul	Vaivesapuram	78.071	10.5396	132

S.No.	State	District	Location	Long	Lat	NO3
2492	Tamil Nadu	Dindigul	Vaivesapuram	78.0419	10.3244	207
2493	Tamil Nadu	Erode	Alampalayam pz	77.6061	11.6272	48
2494	Tamil Nadu	Erode	Alukuli pz	77.3578	11.4481	49
2495	Tamil Nadu	Erode	Ammamet2	77.7444	11.6194	62
2496	Tamil Nadu	Erode	Arakkan kottai(Modur Diversion pirivu)	77.3431	11.4969	46
2497	Tamil Nadu	Erode	Ariyappanpalayam pz	77.2542	11.4756	69
2498	Tamil Nadu	Erode	Asanur pz	77.1289	11.6739	81
2499	Tamil Nadu	Erode	Attani	77.5167	11.5242	50
2500	Tamil Nadu	Erode	Bhavani1	77.5333	11.8083	46
2501	Tamil Nadu	Erode	Chennampatti pz	77.6736	11.7019	67
2502	Tamil Nadu	Erode	Chennimalai2	77.5972	11.1625	52
2503	Tamil Nadu	Erode	Chittodu	77.6778	11.3917	54
2504	Tamil Nadu	Erode	Dharapuram2	77.5292	10.7389	45
2505	Tamil Nadu	Erode	Erakalpudur(Sivanmalai)	77.5347	11.0308	47
2506	Tamil Nadu	Erode	Gandhinagar Thaneerpanthalpalayam	77.6847	11.6589	46
2507	Tamil Nadu	Erode	Gettichcheriyar	77.4133	11.3383	94
2508	Tamil Nadu	Erode	Gobichettipalayam1	77.4458	11.4583	48
2509	Tamil Nadu	Erode	Guvuar dw	77.6822	11.6414	78
2510	Tamil Nadu	Erode	Indiampalayam	77.2694	11.45	66
2511	Tamil Nadu	Erode	Ingur New	77.5814	11.2258	63
2512	Tamil Nadu	Erode	Kambaliyampatti pz	77.5253	11.2314	48
2513	Tamil Nadu	Erode	Karaiyur1	77.5944	10.7639	61
2514	Tamil Nadu	Erode	Kattupalayam pz	77.5953	11.5453	62
2515	Tamil Nadu	Erode	Kavilipalayam	77.2308	11.3802	76
2516	Tamil Nadu	Erode	Kavundappadi	77.5583	11.4333	71
2517	Tamil Nadu	Erode	Kolappalur	79.35	12.5583	45
2518	Tamil Nadu	Erode	Krishnapuram	77.7097	11.5367	81
2519	Tamil Nadu	Erode	Kurichi	77.6939	11.5733	62
2520	Tamil Nadu	Erode	Mulanur2	77.7083	10.7917	48
2521	Tamil Nadu	Erode	Murlipudur	77.656	11.6781	67
2522	Tamil Nadu	Erode	Nambiyur	77.3208	11.3606	52
2523	Tamil Nadu	Erode	Ooricheri	77.6058	11.465	52
2524	Tamil Nadu	Erode	Otti Vilangadu	77.4186	11.2242	66
2525	Tamil Nadu	Erode	Pandiyampalayam pz	77.5175	11.3983	62
2526	Tamil Nadu	Erode	Periyapuliur pz	77.6492	11.4283	62
2527	Tamil Nadu	Erode	Perundurai1	77.5847	11.2792	72
2528	Tamil Nadu	Erode	Pudupalayam1	77.5875	11.5944	72
2529	Tamil Nadu	Erode	Puduvadavalli	77.1761	11.5417	62
2530	Tamil Nadu	Erode	Punjaiduraiampalayam	77.4233	11.5131	55
2531	Tamil Nadu	Erode	Punnachipudur dw	77.6661	11.5919	82
2532	Tamil Nadu	Erode	Punnam pz	77.6139	11.5072	71
2533	Tamil Nadu	Erode	Rajan Nagar pz	77.1422	11.5289	60
2534	Tamil Nadu	Erode	Sathiyamangalam	77.2472	11.5028	70
2535	Tamil Nadu	Erode	Settunampalayam pz	77.6033	11.52	67
2536	Tamil Nadu	Erode	Urachikottai	77.6917	11.4847	80
2537	Tamil Nadu	Erode	Varadanallur	77.6986	11.4933	62
2538	Tamil Nadu	Erode	Vellitirupur	77.6333	11.6208	56
2539	Tamil Nadu	Erode	Vinnampalli	77.2022	11.4328	53
2540	Tamil Nadu	Kancheepuram	Anakkaputhur	80.125	12.9833	109
2541	Tamil Nadu	Kancheepuram	Arasanimangalam	79.7233	12.5689	49
2542	Tamil Nadu	Kancheepuram	Blue beach road.	80.2547	12.9539	59
2543	Tamil Nadu	Kancheepuram	Chemmamcheri Periurban	80.2261	12.8633	74
2544	Tamil Nadu	Kancheepuram	Chinna Nilangarai	80.2608	12.9575	51
2545	Tamil Nadu	Kancheepuram	KOTTIVAKKAM	80.26	12.9681	120
2546	Tamil Nadu	Kancheepuram	Lions Club	80.2639	12.9272	46
2547	Tamil Nadu	Kancheepuram	Mangadu	80.1089	13.0247	55
2548	Tamil Nadu	Kancheepuram	Sadras	80.1517	12.5203	59

S.No.	State	District	Location	Long	Lat	NO3
2549	Tamil Nadu	Kancheepuram	St.Thomas Mount dw	80.1978	13.0072	55
2550	Tamil Nadu	Kancheepuram	Tambaram1	80.1333	12.9333	47
2551	Tamil Nadu	Kancheepuram	Tirukalukundram	79.6667	12.6083	51
2552	Tamil Nadu	Kanyakumari	Karungal pz	77.2347	8.2347	54
2553	Tamil Nadu	Kanyakumari	Kattudurai DW	77.2719	8.2839	46
2554	Tamil Nadu	Kanyakumari	Thiruvattar	77.2678	8.3333	51
2555	Tamil Nadu	Karaikal	Karaikal dw	79.8314	10.9322	115
2556	Tamil Nadu	Karaikal	Kilakasakudi	79.8417	10.9333	46
2557	Tamil Nadu	Karaikal	Kottucherry	79.8167	10.9583	58
2558	Tamil Nadu	Karaikal	Thirunallur	79.7922	10.9261	47
2559	Tamil Nadu	Karur	Jagatabi	78.1667	10.8417	116
2560	Tamil Nadu	Karur	Kovilur	77.8289	10.7603	50
2561	Tamil Nadu	Karur	Melnagavaram dw	78.2219	10.8767	81
2562	Tamil Nadu	Karur	Veerapalayam dw	78.1975	10.7789	52
2563	Tamil Nadu	Karur	Vellianani	78.1333	10.8667	205
2564	Tamil Nadu	Krishnagiri	Bargur	78.2054	12.3242	100
2565	Tamil Nadu	Krishnagiri	Denkanikottai1	77.7833	12.525	64
2566	Tamil Nadu	Krishnagiri	Denkanikottai1	77.7833	12.525	64
2567	Tamil Nadu	Krishnagiri	Enusonai	78.0175	12.6138	114
2568	Tamil Nadu	Krishnagiri	Krishnagiri	78.1259	12.313	122
2569	Tamil Nadu	Krishnagiri	Krishnagiri	78.1259	12.313	122
2570	Tamil Nadu	Krishnagiri	Machinayampalli	77.7844	12.6156	86
2571	Tamil Nadu	Krishnagiri	Machinayampalli	77.7844	12.6156	86
2572	Tamil Nadu	Krishnagiri	Mattur	78.4139	12.3833	211
2573	Tamil Nadu	Krishnagiri	Mattur	78.4139	12.3833	211
2574	Tamil Nadu	Krishnagiri	Panneswara Madam	78.2469	12.3917	170
2575	Tamil Nadu	Krishnagiri	Panneswara Madam	78.2469	12.3917	170
2576	Tamil Nadu	Krishnagiri	Pudur Punganai	78.4842	12.1864	121
2577	Tamil Nadu	Krishnagiri	Sulagiri	78.025	12.6667	206
2578	Tamil Nadu	Krishnagiri	Uttangarai	78.5292	12.2667	85
2579	Tamil Nadu	Krishnagiri	Vappanapalli	78.1925	12.6998	51
2580	Tamil Nadu	Krishnagiri	Virupakshinagar	77.8681	12.5933	84
2581	Tamil Nadu	Madurai	Alanganallur	78.0967	10.05	112
2582	Tamil Nadu	Madurai	Chekkanoorani pz	77.9681	9.9414	114
2583	Tamil Nadu	Madurai	Keelakottai pz	78.0019	9.7867	276
2584	Tamil Nadu	Madurai	Kolluveeranpatti	77.8856	9.7069	51
2585	Tamil Nadu	Madurai	Kolluveeranpatti pz	77.5308	9.4225	313
2586	Tamil Nadu	Madurai	M.K.University	78.0006	9.9408	74
2587	Tamil Nadu	Madurai	Madurai New College House	78.1119	9.9189	83
2588	Tamil Nadu	Madurai	Madurai Rly Colony	78.1036	9.9272	109
2589	Tamil Nadu	Madurai	Melur1	78.3333	10.0306	58
2590	Tamil Nadu	Madurai	Narayanapuram	78.0759	9.5726	134
2591	Tamil Nadu	Madurai	Nilayur pz	78.0332	9.5119	47
2592	Tamil Nadu	Madurai	Peraiyur pz	77.7922	9.7428	55
2593	Tamil Nadu	Madurai	Surakulam pz	78.0567	9.8364	234
2594	Tamil Nadu	Madurai	Thirumangalam new	77.9792	9.8167	186
2595	Tamil Nadu	Madurai	Tirumangalam pz	77.8833	9.9208	238
2596	Tamil Nadu	Madurai	Valayankulam	78.0917	9.8042	213
2597	Tamil Nadu	Madurai	Valayankulam pz	78.0917	9.8042	359
2598	Tamil Nadu	Madurai	Varichiyur pz	78.2569	9.9125	48
2599	Tamil Nadu	Nagapattinam	Keelvalur	79.7333	10.7667	70
2600	Tamil Nadu	Nagapattinam	Nagapattinam	79.8431	10.7825	54

S.No.	State	District	Location	Long	Lat	NO3
2601	Tamil Nadu	Nagapattinam	Odacherry	79.8375	10.6833	61
2602	Tamil Nadu	Nagapattinam	Thalaignayiru	79.6639	11.2097	52
2603	Tamil Nadu	Nagapattinam	Thamaraipulam	79.8292	10.4781	58
2604	Tamil Nadu	Nagapattinam	Tranquebar	79.8514	11.0169	63
2605	Tamil Nadu	Nagapattinam	Valagarai	79.7483	10.6289	58
2606	Tamil Nadu	Nagapattinam	Velanganni	79.8375	10.6833	60
2607	Tamil Nadu	Namakkal	Chittalandur dw	77.9242	11.315	45
2608	Tamil Nadu	Namakkal	Elachipalayam new	78.0125	11.3847	86
2609	Tamil Nadu	Namakkal	Ezhur-Olapalayam D	78.1192	11.3658	66
2610	Tamil Nadu	Namakkal	Gurusamipalayam	78.1344	11.4342	68
2611	Tamil Nadu	Namakkal	Kalipatti	78.0361	11.5167	49
2612	Tamil Nadu	Namakkal	Kamarajar Nagar	78.375	11.4831	48
2613	Tamil Nadu	Namakkal	Kattipalayam	78.0336	11.3156	60
2614	Tamil Nadu	Namakkal	Kokkarayanpettai D	77.7947	11.3147	60
2615	Tamil Nadu	Namakkal	Metala	78.3417	11.5167	51
2616	Tamil Nadu	Namakkal	Minnampalli	78.1865	11.3165	48
2617	Tamil Nadu	Namakkal	Mohanur1	78.1417	11.5125	54
2618	Tamil Nadu	Namakkal	Mullakurchi dw	78.3969	11.4594	62
2619	Tamil Nadu	Namakkal	Nallur1	77.8667	11.2667	52
2620	Tamil Nadu	Namakkal	Paramarathi dw	78.0214	11.1567	64
2621	Tamil Nadu	Namakkal	Pudur Siddhampoondi	77.9142	11.2361	86
2622	Tamil Nadu	Namakkal	Pulavar Palayam	78.1086	11.1956	62
2623	Tamil Nadu	Namakkal	Ramapuram	78.0092	11.4403	48
2624	Tamil Nadu	Namakkal	Rasipuram1	78.225	11.4583	46
2625	Tamil Nadu	Namakkal	selur valavanthinadu	78.3392	11.2889	59
2626	Tamil Nadu	Namakkal	SPN Nagar	78.22	11.1411	53
2627	Tamil Nadu	Namakkal	Thiruchengodu	77.9083	11.3833	67
2628	Tamil Nadu	Namakkal	Thondichettipatti	78.1681	11.1867	61
2629	Tamil Nadu	Namakkal	Thoppur (N)	78.1517	11.1011	68
2630	Tamil Nadu	Namakkal	Unjanai	77.9561	11.3531	72
2631	Tamil Nadu	Namakkal	Uthandipalayam	77.8361	11.2464	48
2632	Tamil Nadu	Namakkal	Vennandur	78.0958	11.5125	55
2633	Tamil Nadu	Perambalur	Annukur	78.8615	11.3293	65
2634	Tamil Nadu	Perambalur	Chettikulam	78.775	11.1347	372
2635	Tamil Nadu	Perambalur	Chitali	78.9682	11.2406	322
2636	Tamil Nadu	Perambalur	Essanai	79.0222	11.069	93
2637	Tamil Nadu	Perambalur	Kallampudur	78.8025	11.235	223
2638	Tamil Nadu	Perambalur	Kunnam	78.9491	11.3477	223
2639	Tamil Nadu	Perambalur	Kurumbalur	78.7203	11.1626	161
2640	Tamil Nadu	Perambalur	Mangalamedu	78.8922	11.2306	124
2641	Tamil Nadu	Perambalur	Nakkaselam	78.9171	11.3186	155
2642	Tamil Nadu	Perambalur	Palaiyur	78.8575	11.1636	81
2643	Tamil Nadu	Perambalur	Perambalur	78.883	11.2333	74
2644	Tamil Nadu	Perambalur	Perambalur	78.9364	11.1586	74
2645	Tamil Nadu	Perambalur	Ranjankudi(Mangalamedu)	78.9412	11.3472	112
2646	Tamil Nadu	Perambalur	Therku Mathevi (Aathukeni)	79.2375	11.14	81
2647	Tamil Nadu	Perambalur	Valikandapuram	79.3142	11.2325	192
2648	Tamil Nadu	Perambalur	Veppur(Nallur)	79.0636	11.3167	61
2649	Tamil Nadu	Perambalur	Vijayagopalapuram	79.0314	11.27	186
2650	Tamil Nadu	Pondicherry	Manapattu EW	79.7747	11.7992	68
2651	Tamil Nadu	Pondicherry	Mangalam-I	79.7391	11.9028	68
2652	Tamil Nadu	Pondicherry	Pondicherry	79.8349	11.9333	62
2653	Tamil Nadu	Pondicherry	Reddichavadi	79.827	11.9368	50
2654	Tamil Nadu	Pondicherry	VILLIANUR	79.7678	11.7665	50
2655	Tamil Nadu	Pudukkottai	Devuipattinam DW	78.8976	9.4808	291
2656	Tamil Nadu	Pudukkottai	Lekkampatti Pz	78.7264	10.5597	154

S.No.	State	District	Location	Long	Lat	NO3
2657	Tamil Nadu	Pudukkottai	Peraiyur Dw	78.4467	9.3569	49
2658	Tamil Nadu	Pudukkottai	Vegupatti Pz	78.5619	10.2755	62
2659	Tamil Nadu	Pudukkottai	Viralimalai DW	78.5499	10.6083	161
2660	Tamil Nadu	Pudukkottai	Mandangudi Dw	78.9283	10.4853	64
2661	Tamil Nadu	Pudukkottai	Sundarapatti Pz	78.7069	10.3588	190
2662	Tamil Nadu	Ramanathapuram	Kizhakakarai	78.784	9.2394	164
2663	Tamil Nadu	Ramanathapuram	Paramakudi DW	78.5375	9.5417	62
2664	Tamil Nadu	Salem	Akkaripalayam	78.05	11.3406	86
2665	Tamil Nadu	Salem	Athur	78.5861	11.5917	67
2666	Tamil Nadu	Salem	Attayampatti Ghss	78.075	11.5253	125
2667	Tamil Nadu	Salem	Attayampatti S.Puram	78.075	11.5253	59
2668	Tamil Nadu	Salem	Ayodhyapattinam	78.2389	11.6697	125
2669	Tamil Nadu	Salem	Dhasanaickanpatty dw	78.1453	11.6094	99
2670	Tamil Nadu	Salem	Gangavalli	78.65	11.4958	81
2671	Tamil Nadu	Salem	Gudamali dw	78.5875	11.4603	79
2672	Tamil Nadu	Salem	Konganapuram	77.9	11.5667	73
2673	Tamil Nadu	Salem	Kulathur	77.7472	11.8472	76
2674	Tamil Nadu	Salem	Kullampatti	77.7917	11.5833	60
2675	Tamil Nadu	Salem	Mallur1	78.1458	11.5375	117
2676	Tamil Nadu	Salem	Mamudi	78.0517	11.5325	143
2677	Tamil Nadu	Salem	Masilapalayam dw	77.7889	11.8089	56
2678	Tamil Nadu	Salem	Mecheri	79.3972	12.8111	164
2679	Tamil Nadu	Salem	Omalur	78.7458	11.7458	270
2680	Tamil Nadu	Salem	P.N.Palayam1	78.5125	11.6472	63
2681	Tamil Nadu	Salem	Palampatti	78.0722	11.5694	234
2682	Tamil Nadu	Salem	Panaimadal	78.4755	11.7185	65
2683	Tamil Nadu	Salem	Panamarathupatti2	78.1931	11.5903	127
2684	Tamil Nadu	Salem	Papparpatty	78.0337	11.3131	215
2685	Tamil Nadu	Salem	Pulaveri	78.1083	11.6083	174
2686	Tamil Nadu	Salem	Puthur dw	78.7833	11.6264	143
2687	Tamil Nadu	Salem	S.K.Garden Nathimedi	78.125	11.6392	55
2688	Tamil Nadu	Salem	Samudram pz	77.9306	11.7472	65
2689	Tamil Nadu	Salem	Sendarpatti	78.5	11.4375	54
2690	Tamil Nadu	Salem	Thandavarayapuram dw	78.5558	11.5903	108
2691	Tamil Nadu	Salem	Tivettipatti	78.0875	11.8667	172
2692	Tamil Nadu	Salem	Vedukathampatty dw	78.0819	11.6528	101
2693	Tamil Nadu	Salem	Veerapandi dw	78.0728	11.5736	84
2694	Tamil Nadu	Salem	Veraganur dw	78.7361	11.4753	116
2695	Tamil Nadu	Sivaganga	Paniyapatti PZ	78.6778	10.3126	114
2696	Tamil Nadu	Sivaganga	Rameswaram DW	79.3204	9.2884	49
2697	Tamil Nadu	Sivaganga	Tiruvengamputhur DW	78.7858	9.8304	192
2698	Tamil Nadu	Thanjavur	Pulavamatham	79.2103	10.8542	51
2699	Tamil Nadu	Theni	Balakombai pz	77.6233	9.9036	62
2700	Tamil Nadu	Theni	Bodinaickanur dw	77.5717	10.0989	119
2701	Tamil Nadu	Theni	Erasakkanaayakanur	77.5417	9.925	52
2702	Tamil Nadu	Theni	Gandamanur	77.5217	9.9183	213
2703	Tamil Nadu	Theni	Gandamanur pz	77.3057	9.5509	174
2704	Tamil Nadu	Theni	Kadamalaikundu pz	77.5031	9.8072	68
2705	Tamil Nadu	Theni	Kamayagoundanpatti pz	77.3169	9.7367	166
2706	Tamil Nadu	Theni	Kodangipatti	77.4361	9.9917	94
2707	Tamil Nadu	Theni	Kodangipatti pz	77.4306	9.9917	61
2708	Tamil Nadu	Theni	Koduvilarpatti pz	77.4919	9.9719	266
2709	Tamil Nadu	Theni	M.Subbalapuram pz	77.5564	9.9717	212
2710	Tamil Nadu	Theni	Okkaraipatti pz	77.5694	9.9625	195
2711	Tamil Nadu	Theni	Periyakulam	77.55	10.1208	105
2712	Tamil Nadu	Theni	Sankarapuram pz	77.3297	9.9069	144
2713	Tamil Nadu	Theni	Seelampatti PZ	77.3928	9.8742	122

S.No.	State	District	Location	Long	Lat	NO3
2714	Tamil Nadu	Theni	ThamminaickPatti pz	77.2997	9.9164	77
2715	Tamil Nadu	Theni	Thevaram pz	77.1637	9.5348	112
2716	Tamil Nadu	Thiruvannamalai	Arani	79.35	12.35	91
2717	Tamil Nadu	Thiruvannamalai	Bagmarpet	79.1333	12.5167	48
2718	Tamil Nadu	Thiruvannamalai	Chetpet1	79.3583	12.4611	54
2719	Tamil Nadu	Thiruvannamalai	Kalavai(Vellore dist)	79.4125	12.4886	92
2720	Tamil Nadu	Thiruvannamalai	Kappalur (T)	78.6083	10.1417	137
2721	Tamil Nadu	Thiruvannamalai	Kattampundi OW	79.0853	12.1267	73
2722	Tamil Nadu	Thiruvannamalai	Melravandavadi	78.7083	12.2083	82
2723	Tamil Nadu	Thiruvannamalai	Nedumpirai OW	79.5611	12.7078	64
2724	Tamil Nadu	Thiruvannamalai	Padagam	79.2039	12.4194	56
2725	Tamil Nadu	Thiruvannamalai	Pudupalayam	78.8792	12.3611	109
2726	Tamil Nadu	Thiruvannamalai	Sathanur	79.8878	12.2097	77
2727	Tamil Nadu	Tirunelveli	Charanmadevi	77.575	8.8278	55
2728	Tamil Nadu	Tirunelveli	Chettikulam	77.6167	8.1667	54
2729	Tamil Nadu	Tirunelveli	Kadayanallur	77.3458	9.0667	55
2730	Tamil Nadu	Tirunelveli	Kadayanallur1	77.35	9.0833	54
2731	Tamil Nadu	Tirunelveli	Kalakadu	77.5986	8.4806	63
2732	Tamil Nadu	Tirunelveli	Kilpaur	77.3833	8.9167	54
2733	Tamil Nadu	Tirunelveli	Mullikulam	77.7	9.4986	57
2734	Tamil Nadu	Tirunelveli	N. Vijayanarayanam	77.7917	8.5333	56
2735	Tamil Nadu	Tirunelveli	Nelliappar temple	77.6883	8.7281	77
2736	Tamil Nadu	Tirunelveli	P.chatram	77.6125	9.1183	74
2737	Tamil Nadu	Tirunelveli	Palayamkottai	77.7333	8.7333	71
2738	Tamil Nadu	Tirunelveli	Panpoli	77.2528	9.0167	46
2739	Tamil Nadu	Tirunelveli	Poothatan Kudieruppu dw	77.5603	8.5783	64
2740	Tamil Nadu	Tirunelveli	Sankarankoil1	77.5583	9.2083	62
2741	Tamil Nadu	Tirunelveli	Seetharappanallur	77.6018	8.7939	70
2742	Tamil Nadu	Tirunelveli	Sivagiri OW	77.4383	9.34	58
2743	Tamil Nadu	Tirunelveli	Taruvai	77.6806	8.6667	68
2744	Tamil Nadu	Tirunelveli	Tenkasi OW	77.3115	8.9633	61
2745	Tamil Nadu	Tirunelveli	Therkuvalliyur OW	77.624	8.3331	76
2746	Tamil Nadu	Tirunelveli	Tiruvembalapuram	77.7583	8.2542	58
2747	Tamil Nadu	Tirunelveli	Valliyoor	77.6583	8.3556	65
2748	Tamil Nadu	Tirunelveli	Valliyur	77.6167	8.3861	61
2749	Tamil Nadu	Tirunelveli	Vannikonendal	77.625	8.6611	56
2750	Tamil Nadu	Tirunelveli	Virasikhamani OW	77.4447	9.0919	56
2751	Tamil Nadu	Tiruppur	KaravallurPZ	77.1692	11.2894	69
2752	Tamil Nadu	Tiruppur	Kasipalayam (T)	77.3858	11.1156	78
2753	Tamil Nadu	Tiruppur	Nachipalayam	77.4458	11.0833	197
2754	Tamil Nadu	Tiruppur	Odakadu	77.3342	11.1117	165
2755	Tamil Nadu	Tiruppur	Rengagoundanpalayam pz	77.3844	11.0697	165
2756	Tamil Nadu	Tiruppur	Weekly Market	77.3431	11.0881	79
2757	Tamil Nadu	Tiruvallur	Kovilpathagai	80.0969	13.1428	90
2758	Tamil Nadu	Tiruvallur	Palavakkam (T)	80.13	11.4158	56
2759	Tamil Nadu	Tiruvallur	Periyapalyam	80.05	13.3125	48
2760	Tamil Nadu	Tiruvallur	Tiruvallur	79.1417	13.1417	156
2761	Tamil Nadu	Tiruvarur	Mannargudi	79.4667	10.6833	102
2762	Tamil Nadu	Tiruvarur	Pangal	79.6417	10.7208	66
2763	Tamil Nadu	Trichy	Chinnagowdanpatti	78.3783	10.4575	136
2764	Tamil Nadu	Trichy	Koppampatti	78.4972	11.3008	99
2765	Tamil Nadu	Trichy	Manaparai	78.4253	10.6144	78
2766	Tamil Nadu	Trichy	Manaparai II	78.4256	10.6147	54
2767	Tamil Nadu	Trichy	Mudaliarchatram	78.6967	10.8003	397
2768	Tamil Nadu	Trichy	Ookaeri	78.55	11.2108	313
2769	Tamil Nadu	Trichy	Peramangalam	78.6542	10.9867	236
2770	Tamil Nadu	Trichy	Pulivalam	78.6375	11.0167	332

S.No.	State	District	Location	Long	Lat	NO3
2771	Tamil Nadu	Trichy	Pullambadi	78.9583	11.0458	256
2772	Tamil Nadu	Trichy	Sirukambur	78.6039	10.9014	200
2773	Tamil Nadu	Trichy	Thathayangarpet	78.4542	11.1208	163
2774	Tamil Nadu	Trichy	Tumbalam	78.4328	11.0306	52
2775	Tamil Nadu	Trichy	Uppiliyapuram	78.5167	11.2622	115
2776	Tamil Nadu	Trichy	Vaiyampatty	78.3	10.55	69
2777	Tamil Nadu	Tuticorin	Eppodumvendram	78.0458	9.0292	78
2778	Tamil Nadu	Tuticorin	Kadambur pz (T)	77.8617	8.9972	52
2779	Tamil Nadu	Tuticorin	Kulasekharaptnm	78.0542	8.4	55
2780	Tamil Nadu	Tuticorin	Kurukkuchalai	78.0917	8.9306	72
2781	Tamil Nadu	Tuticorin	Nagalapuram	78.1306	9.2333	81
2782	Tamil Nadu	Tuticorin	Paikulam	77.8556	8.5181	70
2783	Tamil Nadu	Tuticorin	Pasuvanthanai	77.9596	9.0013	46
2784	Tamil Nadu	Tuticorin	Satankulam	77.9028	8.4333	58
2785	Tamil Nadu	Tuticorin	Sathankulam-n	77.9	8.4444	62
2786	Tamil Nadu	Tuticorin	Thailapuram	77.85	8.6083	79
2787	Tamil Nadu	Tuticorin	Udangudi	78.0335	8.4298	50
2788	Tamil Nadu	Tuticorin	Udangudi dw	78.0292	8.4342	49
2789	Tamil Nadu	Tuticorin	Vembur	78.0819	9.325	58
2790	Tamil Nadu	Tuticorin	Villiseri	77.85	9.0583	56
2791	Tamil Nadu	Vellore	Kandili	78.4556	12.4778	351
2792	Tamil Nadu	Vellore	Virupachipuram(bagayam)	79.1333	12.8778	56
2793	Tamil Nadu	Villipuram	Alathur	78.9471	11.799	50
2794	Tamil Nadu	Villipuram	Allampundi	79.3406	12.2483	112
2795	Tamil Nadu	Villipuram	Andiarpalayam	79.7627	12.0474	136
2796	Tamil Nadu	Villipuram	Arakandanallur	79.2258	11.9742	68
2797	Tamil Nadu	Villipuram	Chinnasalem	78.8684	11.6314	50
2798	Tamil Nadu	Villipuram	Chinnasalem	78.8818	11.6375	130
2799	Tamil Nadu	Villipuram	Eliyathur (New)	79.4185	11.9552	87
2800	Tamil Nadu	Villipuram	Gingee	79.4259	12.2521	56
2801	Tamil Nadu	Villipuram	Gopalapuram-Peramandur	79.5702	12.2285	62
2802	Tamil Nadu	Villipuram	Kadambur	79.05	11.941	50
2803	Tamil Nadu	Villipuram	Kallakurichi	78.9623	11.7391	62
2804	Tamil Nadu	Villipuram	Kallakurichi	78.9538	11.7386	68
2805	Tamil Nadu	Villipuram	Kiliyanur	79.7458	12.1008	68
2806	Tamil Nadu	Villipuram	Kunimedu	79.8929	12.0945	50
2807	Tamil Nadu	Villipuram	Mogaiyur	79.3211	11.025	50
2808	Tamil Nadu	Villipuram	Nallavur Pudur	79.7603	12.1344	99
2809	Tamil Nadu	Villipuram	Ollakkur	79.7245	12.2922	50
2810	Tamil Nadu	Villipuram	Pidagam (Elavarasanarkottai) (A)	79.1792	11.7206	56
2811	Tamil Nadu	Villipuram	Rajampalayam	79.1378	11.9459	93
2812	Tamil Nadu	Villipuram	Rishivandiyam	79.0947	11.8131	112
2813	Tamil Nadu	Villipuram	Sadaikattu attipattu	79.1659	11.9988	93
2814	Tamil Nadu	Villipuram	Sankarapuram	78.9178	11.8857	62
2815	Tamil Nadu	Villipuram	Sankarapuram	78.9147	11.8866	74
2816	Tamil Nadu	Villipuram	Siruvadi	79.8441	12.2048	56
2817	Tamil Nadu	Villipuram	TirukkOilur	79.1927	11.9535	62
2818	Tamil Nadu	Villipuram	Ulagankaththan-Thimmaiya nagar	78.9347	11.6953	192
2819	Tamil Nadu	Villipuram	Ulundurpet	79.2893	11.6908	74
2820	Tamil Nadu	Villipuram	Vadasemapalaym	78.9314	11.8592	99
2821	Tamil Nadu	Villipuram	Vazhavanthankuppam	79.1289	11.7219	74
2822	Tamil Nadu	Villipuram	Avalurpet(Villupuram	79.2406	12.6658	107
2823	Tamil Nadu	Virudhunagar	Alangulam	77.6861	9.3639	101
2824	Tamil Nadu	Virudhunagar	Aviyur dw	78.1008	9.7389	80
2825	Tamil Nadu	Virudhunagar	Devadanam1	77.4656	9.3833	83

S.No.	State	District	Location	Long	Lat	NO3
2826	Tamil Nadu	Virudhunagar	Kalloorani	78.165	9.4639	47
2827	Tamil Nadu	Virudhunagar	Kariyapatti1	78.1083	9.6694	90
2828	Tamil Nadu	Virudhunagar	Mullikulam-V	77.7	9.4986	48
2829	Tamil Nadu	Virudhunagar	Muntalapuram	77.8894	9.0172	66
2830	Tamil Nadu	Virudhunagar	Nenmeni1	78.0083	9.325	74
2831	Tamil Nadu	Virudhunagar	Sevalpatti	77.9583	9.5583	82
2832	Tamil Nadu	Virudhunagar	Sivakasi2	77.7917	9.45	80
2833	Tamil Nadu	Virudhunagar	Sundarapandiyan	77.6667	9.6083	58
2834	Tamil Nadu	Virudhunagar	Vembakkottai-OW	77.7667	9.3333	67
2835	Telangana	Adilabad	Asifabad	79.2833	19.3656	50
2836	Telangana	Adilabad	Balampur	78.8061	19.3027	135
2837	Telangana	Adilabad	Basar - PZ	77.9451	18.8722	103
2838	Telangana	Adilabad	Bela1	78.7624	19.7193	115
2839	Telangana	Adilabad	Bela-PZ	78.7609	19.7186	103
2840	Telangana	Adilabad	Bhainsa	77.9781	19.1029	120
2841	Telangana	Adilabad	Bhimavaram1	79.6963	18.8462	70
2842	Telangana	Adilabad	Bhimini -PZ-1	79.5802	19.1959	84
2843	Telangana	Adilabad	Danora - B	78.5853	19.5124	118
2844	Telangana	Adilabad	Dantalapally	78.818	19.3263	151
2845	Telangana	Adilabad	Dehgaon	78.3818	19.4759	59
2846	Telangana	Adilabad	Devadapalle	78.9649	19.3656	89
2847	Telangana	Adilabad	Dorli	78.3726	19.6379	129
2848	Telangana	Adilabad	Echoda-PZ	78.4507	19.4288	54
2849	Telangana	Adilabad	Elegaon	77.9158	19.061	46
2850	Telangana	Adilabad	Gubba - Ramtek	78.4501	19.4555	137
2851	Telangana	Adilabad	Gudihathur	78.5134	19.5304	54
2852	Telangana	Adilabad	Hajipur	79.3039	18.864	282
2853	Telangana	Adilabad	Indravalli-PZ	78.6622	19.5004	105
2854	Telangana	Adilabad	Jamidi	78.4579	19.7074	175
2855	Telangana	Adilabad	Kachkanti	78.5656	19.6541	173
2856	Telangana	Adilabad	Kalamadugu	78.9493	19.0897	205
2857	Telangana	Adilabad	Kamatwada	78.3914	19.796	61
2858	Telangana	Adilabad	Kankapur	78.0283	18.966	60
2859	Telangana	Adilabad	Karanji -khurd	78.6974	19.7625	112
2860	Telangana	Adilabad	Lakshettipet-3	79.1973	18.909	47
2861	Telangana	Adilabad	Lingi	78.3721	19.6941	133
2862	Telangana	Adilabad	Mamda	78.5253	19.0767	77
2863	Telangana	Adilabad	Mavala (adilabad)	78.5083	19.6377	142
2864	Telangana	Adilabad	Mudhol-PZ	77.92	18.9837	144
2865	Telangana	Adilabad	Neredikonda1	78.4063	19.2979	63
2866	Telangana	Adilabad	Old manchierala	79.4284	18.8721	55
2867	Telangana	Adilabad	Pembi	78.6355	19.195	108
2868	Telangana	Adilabad	Pendapalle	78.0663	19.088	47
2869	Telangana	Adilabad	Pochampalli	78.8197	17.3472	140
2870	Telangana	Adilabad	Potaram	78.5301	19.0154	47
2871	Telangana	Adilabad	Rajura	77.9573	19.2477	87
2872	Telangana	Adilabad	Rebbenna1	79.4147	19.2596	69
2873	Telangana	Adilabad	Saghvi	78.2771	19.0466	288
2874	Telangana	Adilabad	Sangvi	78.774	19.5938	61
2875	Telangana	Adilabad	Sitagondi	78.4937	19.581	84
2876	Telangana	Adilabad	Tapalpur	79.0766	19.0626	65
2877	Telangana	Adilabad	Tocham	78.5667	19.5289	51
2878	Telangana	Adilabad	Udampur	78.8772	19.2122	137
2879	Telangana	Adilabad	Uttoor	78.7769	19.3746	83
2880	Telangana	Adilabad	Uttoor	78.777	19.375	122
2881	Telangana	Adilabad	Wadgaon	77.7851	18.9821	130
2882	Telangana	Adilabad	Wadgaon	77.7851	18.9821	132

S.No.	State	District	Location	Long	Lat	NO3
2883	Telangana	Adilabad	Wakri (wankidi colony)	78.5333	19.6667	67
2884	Telangana	Hyderabad	Attapur	78.4236	17.3622	76
2885	Telangana	Hyderabad	Begumpet-PZ (Balkampet)	78.452	17.445	48
2886	Telangana	Hyderabad	Falaknama2	78.4682	17.3345	58
2887	Telangana	Karimnagar	Boinpally Pz	78.9364	18.5031	77
2888	Telangana	Karimnagar	Buswapuram1	79.0565	18.1031	52
2889	Telangana	Karimnagar	Dharmapuri-New	79.0974	18.9501	158
2890	Telangana	Karimnagar	Gandipalli Pz	79.1577	18.0079	46
2891	Telangana	Karimnagar	Garepalli	79.9448	18.6255	123
2892	Telangana	Karimnagar	Husnabad-1	79.2114	18.126	105
2893	Telangana	Karimnagar	Jagityal-New	78.901	18.7975	153
2894	Telangana	Karimnagar	Kalwacherla	79.5341	18.6363	88
2895	Telangana	Karimnagar	Katkur Pz	79.2383	18.0423	91
2896	Telangana	Karimnagar	Kesawapatnam	79.3008	18.2935	236
2897	Telangana	Karimnagar	Kothapally	79.1709	18.7289	69
2898	Telangana	Karimnagar	Lakshmipur Pz	79.2834	18.4449	73
2899	Telangana	Karimnagar	Mahadevpur1	79.9797	18.7298	64
2900	Telangana	Karimnagar	Mallannapeta	79.0102	18.7995	170
2901	Telangana	Karimnagar	Manthani	79.6701	18.6521	201
2902	Telangana	Karimnagar	Metpalli1 (Arepeta)	78.6477	18.8395	127
2903	Telangana	Karimnagar	Mustabad	78.7185	18.2806	72
2904	Telangana	Karimnagar	Mustafabad	78.7138	18.2817	58
2905	Telangana	Karimnagar	Nusthulpur Pz	79.178	18.3186	49
2906	Telangana	Karimnagar	Polosa	78.9476	18.8391	94
2907	Telangana	Karimnagar	Suddala	78.7952	18.4697	100
2908	Telangana	Karimnagar	Tadikal	79.2894	18.3123	52
2909	Telangana	Karimnagar	Tummanapalli	79.3742	18.2269	84
2910	Telangana	Karimnagar	Venkatapur	79.8101	18.6577	50
2911	Telangana	Karimnagar	Venkatrapalli Pz	78.959	18.4356	53
2912	Telangana	Karimnagar	Yakeenpur	78.6943	18.7894	50
2913	Telangana	Karimnagar	Yelakaturthy-Pz	79.4494	18.0996	64
2914	Telangana	Khammam	Annarugudem	80.4261	17.2603	163
2915	Telangana	Khammam	Aspaka	81.1111	17.3883	64
2916	Telangana	Khammam	Bathulapally	80.5826	17.2032	66
2917	Telangana	Khammam	Chirevalli	81.0867	17.5939	200
2918	Telangana	Khammam	Edugarallapalli	81.1714	17.7544	150
2919	Telangana	Khammam	Enkur - Pz	80.4419	17.3367	55
2920	Telangana	Khammam	Gandhampally (Santulalpoda)	80.1392	17.4867	196
2921	Telangana	Khammam	Garla	80.1392	17.4867	102
2922	Telangana	Khammam	Kattakur	80.0402	17.1741	60
2923	Telangana	Khammam	Kesavapuram	80.7464	17.6056	97
2924	Telangana	Khammam	Konijarla	80.2939	17.2233	53
2925	Telangana	Khammam	Lakshmipuram	81.1	17.7333	96
2926	Telangana	Khammam	Rangam Banjar Malsur Tanda	80.5089	17.1944	130
2927	Telangana	Khammam	Rebbavaram	80.3369	17.1167	217
2928	Telangana	Khammam	Remidicherla	80.4979	16.7996	61
2929	Telangana	Khammam	Sitarampuram	80.6431	17.2008	52
2930	Telangana	Khammam	Thatipudi	80.3375	17.1483	86
2931	Telangana	Khammam	Thirumalayapalem	80.0365	17.3114	256
2932	Telangana	Khammam	Yerupalem	80.4722	16.8333	493
2933	Telangana	Mahabubnagar	Baswaipalle	77.8972	16.5978	83
2934	Telangana	Mahabubnagar	Beechapally	77.9286	16.1603	46
2935	Telangana	Mahabubnagar	Bommaraju Palli	78.4006	16.7783	95
2936	Telangana	Mahabubnagar	Charakonda- Aq-I	78.7108	16.6956	105
2937	Telangana	Mahabubnagar	Chennavalli	78.1332	16.8644	270

S.No.	State	District	Location	Long	Lat	NO3
2938	Telangana	Mahabubnagar	Chowdoor	78.0708	16.9764	51
2939	Telangana	Mahabubnagar	Dhanwada-Pz	77.6564	16.6411	228
2940	Telangana	Mahabubnagar	Enkapalli	77.6347	17.1519	100
2941	Telangana	Mahabubnagar	Gantlavelli-Pz	78.2467	16.995	54
2942	Telangana	Mahabubnagar	Goka Paslabad	77.5736	16.9603	68
2943	Telangana	Mahabubnagar	Gundimal	77.7103	16.8958	353
2944	Telangana	Mahabubnagar	Hanwada	77.9194	16.8122	307
2945	Telangana	Mahabubnagar	Hasnabad	77.6528	17.0539	71
2946	Telangana	Mahabubnagar	Janumpalle	78.2794	16.3005	54
2947	Telangana	Mahabubnagar	Jedcherla-Pz	78.1447	16.7475	47
2948	Telangana	Mahabubnagar	Jupally- Aq-I	78.6031	16.6592	1128
2949	Telangana	Mahabubnagar	Kadtal-Pz	78.5014	16.9681	50
2950	Telangana	Mahabubnagar	Kalwakurthy- Aq-I	78.4858	16.6742	95
2951	Telangana	Mahabubnagar	Kesampet-Pz	78.345	16.9553	287
2952	Telangana	Mahabubnagar	Khilla Ghanpur	78.0385	16.5519	276
2953	Telangana	Mahabubnagar	Kistampalli	77.956	17.0602	62
2954	Telangana	Mahabubnagar	Kodangal	77.6264	17.1072	112
2955	Telangana	Mahabubnagar	Kothapalle	77.7996	16.28	74
2956	Telangana	Mahabubnagar	Madugula-Pz	78.6922	16.8558	80
2957	Telangana	Mahabubnagar	Makthal	77.5025	16.5106	87
2958	Telangana	Mahabubnagar	Mamaipalli- Aq-I	78.1672	16.4733	66
2959	Telangana	Mahabubnagar	Manganur- Aq-I	78.1558	16.5822	110
2960	Telangana	Mahabubnagar	Marchala	78.4551	16.7034	53
2961	Telangana	Mahabubnagar	Midjil-Pz	78.3231	16.7436	167
2962	Telangana	Mahabubnagar	Mitta Nandimala	77.8106	16.23	57
2963	Telangana	Mahabubnagar	Mogiligidda-Pz	78.1175	17.0828	52
2964	Telangana	Mahabubnagar	Nadimpalli- Aq-I	78.685	16.4153	95
2965	Telangana	Mahabubnagar	Pebbair-Aq-I	77.9975	16.1989	209
2966	Telangana	Mahabubnagar	Peddadaggada-Aq-I	78.1644	16.0503	50
2967	Telangana	Mahabubnagar	Ragidimailaram	77.6678	17.1225	197
2968	Telangana	Mahabubnagar	Talakondapalli-Pz	78.4133	16.8906	121
2969	Telangana	Mahabubnagar	Telkapalli- Aq-I	78.4517	16.4494	97
2970	Telangana	Mahabubnagar	Thaduru- Aq-I	78.3597	16.5158	62
2971	Telangana	Mahabubnagar	Veltoor- Aq-I	78.6867	16.5067	73
2972	Telangana	Mahabubnagar	Vithayapalli- Aq-I	78.5283	16.8822	140
2973	Telangana	Mahabubnagar	Weljorla	78.2753	17.0375	235
2974	Telangana	Medak	Ahimadepur	78.7187	17.9341	120
2975	Telangana	Medak	Alipur	78.9236	18.2387	252
2976	Telangana	Medak	Badampet	77.6569	17.5656	90
2977	Telangana	Medak	Bilalpur(Pn)	77.6908	17.5628	48
2978	Telangana	Medak	Chandi	78.3902	17.7864	80
2979	Telangana	Medak	Chinnakodur	78.8966	18.1617	52
2980	Telangana	Medak	Chintala Cheruvu-Pz	78.2353	17.6514	53
2981	Telangana	Medak	Didigi	77.5997	17.7261	98
2982	Telangana	Medak	Dubbak	78.6669	18.1743	78
2983	Telangana	Medak	G.P. Ponnala	78.8576	18.0641	63
2984	Telangana	Medak	Gajwel	78.6921	17.8438	51
2985	Telangana	Medak	Ganeshpalli	78.748	17.8048	48
2986	Telangana	Medak	Ghatpalli	77.8497	17.9022	109
2987	Telangana	Medak	Gumardalla1	78.3686	17.6794	79
2988	Telangana	Medak	Jagadevpur	78.8051	17.7687	68
2989	Telangana	Medak	Japtisivnoor	78.4261	18.069	66
2990	Telangana	Medak	Jinnaram	78.3309	17.6311	54
2991	Telangana	Medak	Jinnaram	78.3303	17.6326	121
2992	Telangana	Medak	Kaudipally-Pz	78.2078	17.9014	114
2993	Telangana	Medak	Kistapur	78.714	17.9643	46
2994	Telangana	Medak	Kohir	77.7172	17.61	241

S.No.	State	District	Location	Long	Lat	NO3
2995	Telangana	Medak	Kondapak	78.8614	17.9758	173
2996	Telangana	Medak	Manoharabad	78.4637	17.7658	56
2997	Telangana	Medak	Masanpally	77.8731	18.1836	119
2998	Telangana	Medak	Medikonda	77.8933	17.9211	100
2999	Telangana	Medak	Medinipur	78.8076	17.9022	49
3000	Telangana	Medak	Mulugu	78.6378	17.7368	52
3001	Telangana	Medak	Nagulapally	77.9161	17.8836	200
3002	Telangana	Medak	Narayankhed	77.7722	18.0389	72
3003	Telangana	Medak	Narsingi	78.0672	18.0211	258
3004	Telangana	Medak	Nizampet	77.8839	18.0953	55
3005	Telangana	Medak	Nizampet	77.8839	18.0953	361
3006	Telangana	Medak	Pamulaparathi	78.6914	17.7708	72
3007	Telangana	Medak	Pastapur	77.6403	17.6961	67
3008	Telangana	Medak	Patigadda Tanda	78.2486	18.0981	80
3009	Telangana	Medak	Pz of Aq-I, At-Atmakur	77.9322	17.6572	70
3010	Telangana	Medak	Pz of Aq-I, At-Ismaikhpet	78.1569	17.6228	183
3011	Telangana	Medak	Pz of Aq-I, At-Mudimanikyam	78.0119	17.7647	65
3012	Telangana	Medak	Pz of Aq-I, At-Peddareddypet	77.9572	17.7683	120
3013	Telangana	Medak	Pz of Aq-I, At-Reddypalli	78.2586	17.78	48
3014	Telangana	Medak	Raghavapuram	78.7762	18.1758	279
3015	Telangana	Medak	Raipally	77.8094	17.8867	49
3016	Telangana	Medak	Raipole	78.6293	17.9354	326
3017	Telangana	Medak	Rajgopalpet	78.9435	18.0917	50
3018	Telangana	Medak	Ramanpatla	78.9142	18.1397	81
3019	Telangana	Medak	Rameshwaram Banda	78.2792	17.5567	110
3020	Telangana	Medak	Sivampet	78.3697	17.7863	102
3021	Telangana	Medak	Tadkal	77.7058	18.2322	125
3022	Telangana	Medak	Talelma	77.9761	17.8436	53
3023	Telangana	Medak	Tatipally	77.8106	17.7444	210
3024	Telangana	Medak	Wadiyaram	78.4649	17.9573	100
3025	Telangana	Medak	Wargal	78.6152	17.7739	54
3026	Telangana	Nalgonda	Ajilapuram	78.8047	16.9823	438
3027	Telangana	Nalgonda	Aler	79.0431	17.6686	79
3028	Telangana	Nalgonda	Antampet-Pz-I	78.8889	17.0361	242
3029	Telangana	Nalgonda	Antampet-Pz-II	78.8889	17.0361	93
3030	Telangana	Nalgonda	Chandepalli	79.0936	17.5336	51
3031	Telangana	Nalgonda	Chikatimamidi	79.0244	17.0981	95
3032	Telangana	Nalgonda	Chinna Raviral	78.7247	17.3831	350
3033	Telangana	Nalgonda	Choutuppal-	78.9158	17.25	263
3034	Telangana	Nalgonda	Devarakonda	78.925	16.8583	68
3035	Telangana	Nalgonda	Devarakonda	78.9189	16.6911	162
3036	Telangana	Nalgonda	Dospadu	79.6178	17.0214	50
3037	Telangana	Nalgonda	G.Palli(Dindi)-Pz	78.7083	16.5403	124
3038	Telangana	Nalgonda	Gagillapuram	78.8269	16.6053	103
3039	Telangana	Nalgonda	Godumadaka	79.3684	16.6357	183
3040	Telangana	Nalgonda	Gouraipally	78.9467	17.6692	150
3041	Telangana	Nalgonda	Gujja -Pz-I	78.9708	17.1375	93
3042	Telangana	Nalgonda	Gujja -Pz-II	78.9708	17.1375	93
3043	Telangana	Nalgonda	Hasanabad	78.8831	17.5272	68
3044	Telangana	Nalgonda	Huzurnagar-Pz	79.5333	16.8972	183
3045	Telangana	Nalgonda	Iddampalli	78.7831	16.7334	110
3046	Telangana	Nalgonda	Kanagal-Pz	79.2017	16.9467	54
3047	Telangana	Nalgonda	Kethepalli	79.5081	17.1597	313
3048	Telangana	Nalgonda	Kodad-Pz	79.9583	16.9306	155

S.No.	State	District	Location	Long	Lat	NO3
3049	Telangana	Nalgonda	Koratikal	79.1064	17.4969	105
3050	Telangana	Nalgonda	Kudakuda	79.6272	17.165	68
3051	Telangana	Nalgonda	Kurumapalli, Aq-I	78.7947	16.8869	183
3052	Telangana	Nalgonda	Lingarajpalle	79.1297	17.4089	192
3053	Telangana	Nalgonda	M.Turkapalli- Pz	78.7958	17.6569	91
3054	Telangana	Nalgonda	Madugula Palli-Pz	79.4639	16.975	72
3055	Telangana	Nalgonda	Magulapally	79.4658	16.9697	207
3056	Telangana	Nalgonda	Malkapur Aq-Ii	78.8008	17.2764	78
3057	Telangana	Nalgonda	Malkapuram	78.7961	17.2739	53
3058	Telangana	Nalgonda	Mangapur	79.5389	17.0097	223
3059	Telangana	Nalgonda	Miryalaguda- Pz	79.5653	16.875	66
3060	Telangana	Nalgonda	Mukundapuram	79.8789	17.0192	119
3061	Telangana	Nalgonda	Munagala	79.8336	17.0528	135
3062	Telangana	Nalgonda	Munagala-Pz	79.8367	17.0517	62
3063	Telangana	Nalgonda	Munipampula	79.1578	17.3231	177
3064	Telangana	Nalgonda	Nagaram	79.0339	17.3575	326
3065	Telangana	Nalgonda	Nagarjunasagar Polygon	79.3214	16.5847	77
3066	Telangana	Nalgonda	Nakrekal-Pz	79.4194	17.0994	85
3067	Telangana	Nalgonda	Nalgonda-2	79.2758	17.0508	166
3068	Telangana	Nalgonda	Nidamanuru	79.3689	16.8228	104
3069	Telangana	Nalgonda	Nidamanuru- Pz	79.375	16.8306	205
3070	Telangana	Nalgonda	Panthangi -Pz 1	78.9556	17.2431	88
3071	Telangana	Nalgonda	Peddavoora	79.2108	16.7289	92
3072	Telangana	Nalgonda	Penpahad-Pz	79.6528	17.0083	93
3073	Telangana	Nalgonda	Pillalamarri	79.5992	17.1669	65
3074	Telangana	Nalgonda	Pochampalli	78.8197	17.3472	131
3075	Telangana	Nalgonda	Ponugudu	79.7261	16.9169	77
3076	Telangana	Nalgonda	Ramannapet	79.0953	17.2933	111
3077	Telangana	Nalgonda	S.Atmakur	79.6964	17.2319	226
3078	Telangana	Nalgonda	Salavari Aq-1 (swamiwari lingotam)	78.9531	17.2928	123
3079	Telangana	Nalgonda	Salavari Aq-II (swamyvaari lingotam)	78.9531	17.2928	108
3080	Telangana	Nalgonda	Satyanarayanapuram, Aq-I	79.4631	16.7944	441
3081	Telangana	Nalgonda	Suryapet-Pz	79.6236	17.1333	70
3082	Telangana	Nalgonda	Thungapadu	79.5	16.8333	52
3083	Telangana	Nalgonda	Tripuraram	79.4742	16.8328	64
3084	Telangana	Nalgonda	Vemulapalli	79.5306	16.9253	55
3085	Telangana	Nalgonda	Venkatapuram	78.8664	17.6417	48
3086	Telangana	Nalgonda	Yadagirigutta	78.8625	17.5847	59
3087	Telangana	Nalgonda	Yellammagudem	79.4997	17.08	48
3088	Telangana	Nizamabad	Annaram	78.201	18.9562	97
3089	Telangana	Nizamabad	Arepally	78.3453	18.2141	46
3090	Telangana	Nizamabad	Armur-Pz	78.2886	18.7998	276
3091	Telangana	Nizamabad	Bairangaidi	77.7843	18.4985	190
3092	Telangana	Nizamabad	Balkonda 2012pz	78.345	18.8719	66
3093	Telangana	Nizamabad	Balkonda1	78.3399	18.8712	50
3094	Telangana	Nizamabad	Baswapur	78.4129	18.1524	110
3095	Telangana	Nizamabad	Bichkunda	77.7148	18.4005	160
3096	Telangana	Nizamabad	Bichkunda-Pz	77.7251	18.4001	153
3097	Telangana	Nizamabad	Chandrainpally	78.2221	18.5118	67
3098	Telangana	Nizamabad	Dharmora	78.4261	18.8649	128
3099	Telangana	Nizamabad	Dharpalli-Pz	78.3618	18.5759	48
3100	Telangana	Nizamabad	Dubbaka	78.3729	18.6338	62
3101	Telangana	Nizamabad	Dudgaon	78.3778	18.9791	96
3102	Telangana	Nizamabad	Gangoppala	78.425	18.6374	65
3103	Telangana	Nizamabad	Gotimukala	78.1058	18.8035	93

S.No.	State	District	Location	Long	Lat	NO3
3104	Telangana	Nizamabad	Janakampet	78.0229	18.7078	90
3105	Telangana	Nizamabad	Kamareddy-2012pz	78.3436	18.3218	260
3106	Telangana	Nizamabad	Khazipur	77.7944	18.6787	196
3107	Telangana	Nizamabad	Mupkal	78.358	18.9096	95
3108	Telangana	Nizamabad	Patarajampet	78.352	18.2833	100
3109	Telangana	Nizamabad	Rampurkalan1	77.8505	18.3206	399
3110	Telangana	Nizamabad	Tadvai-1	78.2547	18.3129	84
3111	Telangana	Ranga Reddy	Aliabad	78.5792	17.5972	119
3112	Telangana	Ranga Reddy	Ameerpelli	78.3434	17.1516	81
3113	Telangana	Ranga Reddy	Angadi Chittampalli	78.0306	17.2889	79
3114	Telangana	Ranga Reddy	Antaram (C)	78.032	17.3254	94
3115	Telangana	Ranga Reddy	Bata Singaram	78.7283	17.3029	76
3116	Telangana	Ranga Reddy	Bompalli	77.8709	17.1145	107
3117	Telangana	Ranga Reddy	Chevella-Pz	78.1391	17.3073	131
3118	Telangana	Ranga Reddy	Chimaldarri	78.0035	17.4654	67
3119	Telangana	Ranga Reddy	Chippalapally	78.3967	17.048	111
3120	Telangana	Ranga Reddy	C-Patelgudem	78.6329	17.1629	54
3121	Telangana	Ranga Reddy	Dubbacherla	78.3701	17.1086	139
3122	Telangana	Ranga Reddy	Gudur	78.2739	17.2087	246
3123	Telangana	Ranga Reddy	Hayatnagar-1	78.6047	17.3292	82
3124	Telangana	Ranga Reddy	Hyatabad-Pz	78.2018	17.2275	51
3125	Telangana	Ranga Reddy	Ibrahimpattanam	78.6458	17.1986	74
3126	Telangana	Ranga Reddy	Kammata-Pz	78.1582	17.374	107
3127	Telangana	Ranga Reddy	Kankal	78.0075	17.1994	108
3128	Telangana	Ranga Reddy	Kerelli	77.8285	17.3111	62
3129	Telangana	Ranga Reddy	Kollapadkal	78.3665	17.0806	151
3130	Telangana	Ranga Reddy	Kotepally (New)	77.7462	17.3824	66
3131	Telangana	Ranga Reddy	Kottapalli	78.6793	16.9704	159
3132	Telangana	Ranga Reddy	Kushaiguda	78.5736	17.4782	95
3133	Telangana	Ranga Reddy	Manchal	78.7269	17.1603	93
3134	Telangana	Ranga Reddy	Marpally	77.4671	17.1554	198
3135	Telangana	Ranga Reddy	Nacharam	78.55	17.4312	196
3136	Telangana	Ranga Reddy	Nagarguda-Pz	78.1335	17.2358	48
3137	Telangana	Ranga Reddy	Naskal	77.8725	17.225	126
3138	Telangana	Ranga Reddy	Pargi-Pz	77.8759	17.1746	47
3139	Telangana	Ranga Reddy	Peddumul	77.6605	17.3391	68
3140	Telangana	Ranga Reddy	Peddapur	77.756	17.4738	47
3141	Telangana	Ranga Reddy	Polkampalli	78.7068	17.2261	63
3142	Telangana	Ranga Reddy	Salbathpur	78.1594	17.1203	53
3143	Telangana	Ranga Reddy	Sanathnagar	78.435	17.4621	55
3144	Telangana	Ranga Reddy	Saroornagar-Pz	78.5359	17.3582	57
3145	Telangana	Ranga Reddy	Shamshabad1	78.3957	17.2561	53
3146	Telangana	Ranga Reddy	Shankarapally	78.1324	17.4578	101
3147	Telangana	Ranga Reddy	Siddlur	77.9915	17.3583	109
3148	Telangana	Ranga Reddy	Siripuram	77.8428	17.5231	159
3149	Telangana	Ranga Reddy	Sultanpoor Thanda	77.8482	17.1514	64
3150	Telangana	Ranga Reddy	Tangadpalli	78.0604	17.3749	70
3151	Telangana	Ranga Reddy	Thandur	77.591	17.2617	96
3152	Telangana	Ranga Reddy	Uppal	78.561	17.4023	60
3153	Telangana	Ranga Reddy	Vattiminapally	77.9818	17.437	110
3154	Telangana	Ranga Reddy	Vikarabad	77.9014	17.3351	50
3155	Telangana	Ranga Reddy	Yelal	77.6377	17.2102	60
3156	Telangana	Ranga Reddy	Yenkathala	77.9416	17.4944	56
3157	Telangana	Warangal	Akulatanda	79.9135	17.986	95
3158	Telangana	Warangal	Ammavaripeta	79.5572	17.9413	56
3159	Telangana	Warangal	Ashok Nagar	79.951	17.954	84
3160	Telangana	Warangal	Chelvai-2	80.1021	18.2059	85

S.No.	State	District	Location	Long	Lat	NO3
3161	Telangana	Warangal	Dammannapet	79.525	17.7516	482
3162	Telangana	Warangal	Duggondi	79.8063	18.0217	62
3163	Telangana	Warangal	Edjarla Pz	79.9652	17.4311	67
3164	Telangana	Warangal	Ghanpur Pz	79.3692	17.8507	57
3165	Telangana	Warangal	Gudur Pz	79.4085	17.7341	95
3166	Telangana	Warangal	Gudur2	79.9796	17.801	63
3167	Telangana	Warangal	Ingurti	79.8018	17.6672	111
3168	Telangana	Warangal	Inoli Pz	79.548	17.8706	91
3169	Telangana	Warangal	Ippagudem	79.3745	17.7679	91
3170	Telangana	Warangal	Jhalli	79.8564	17.8433	229
3171	Telangana	Warangal	Katapuram-2	80.4007	18.1623	280
3172	Telangana	Warangal	Kesamudram	79.9001	17.6865	75
3173	Telangana	Warangal	Kolukonda Pz	79.3193	17.6629	73
3174	Telangana	Warangal	Kothapalli	79.3047	17.848	224
3175	Telangana	Warangal	Mutsyala-Pz	78.9933	17.8986	88
3176	Telangana	Warangal	Nellikuduru	79.7544	17.5752	82
3177	Telangana	Warangal	Pasara	80.1666	18.1944	86
3178	Telangana	Warangal	Pedda Pendyal	79.4342	17.9078	126
3179	Telangana	Warangal	Ramavaram	79.463	17.5278	49
3180	Telangana	Warangal	Thatikonda Pz	79.3025	17.863	57
3181	Telangana	Warangal	Theegarajupalli	79.7077	17.8328	150
3182	Telangana	Warangal	Urugonda	79.6899	18.0683	55
3183	Telangana	Warangal	Velair	79.3322	18.0055	121
3184	Telangana	Warangal	Yellapur	79.5012	18.0787	60
3185	Uttar Pradesh	Deoria	BHAGALPUR	83.86903	26.16857	48.55
3186	Uttar Pradesh	Agra	ACHHNERA	77.75565	27.17659	88
3187	Uttar Pradesh	Agra	BAH	78.58945	26.87012	120
3188	Uttar Pradesh	Agra	BARAULI AHIR	78.0601	27.1206	60
3189	Uttar Pradesh	Agra	FATEHPUR SIKARI	77.65428	27.08437	850
3190	Uttar Pradesh	Agra	JAGNER	77.60434	26.86455	425
3191	Uttar Pradesh	Agra	KHANDAULI	78.02975	27.31166	317
3192	Uttar Pradesh	Agra	SAIYAN	77.93848	26.94496	167
3193	Uttar Pradesh	Agra	SHAMSABAD	78.12456	27.01399	79
3194	Uttar Pradesh	Aligarh	KHAIR	77.83641	27.94351	227
3195	Uttar Pradesh	Aligarh	Nama	77.94871	27.61766	45
3196	Uttar Pradesh	Allahabad	MANDA	82.1297	25.196	55
3197	Uttar Pradesh	Amroha/ J.P. Nagar	Amroha	78.47583	28.89139	48
3198	Uttar Pradesh	Amroha/ J.P. Nagar	Amroha	78.57	28.89333	89
3199	Uttar Pradesh	Azamgarh	Harriya	83.1838	26.0549	69
3200	Uttar Pradesh	Azamgarh	Mohammadpur	83.0273	25.9624	57
3201	Uttar Pradesh	Azamgarh	Rani ki Sarai	83.1109	26.0022	66
3202	Uttar Pradesh	Ballia	Negara	83.8741	25.9788	61
3203	Uttar Pradesh	Banda	Banda	80.33096	25.48113	72
3204	Uttar Pradesh	Basti	Kudraha	82.79911	26.61535	122
3205	Uttar Pradesh	Budaun	Ujhani	79.01935	28.00365	49
3206	Uttar Pradesh	Bulandshahr	Mustfabad Daduwa	78.02931	28.2462	55
3207	Uttar Pradesh	Bulandshar	SIYANA	78.05413	28.62479	69
3208	Uttar Pradesh	Chitrakoot	Pahari	80.96311	25.33361	173
3209	Uttar Pradesh	Etah	JALESAR	78.30801	27.47949	50
3210	Uttar Pradesh	Farrukhabad	KAMALGANJ	79.6321	27.26088	189
3211	Uttar Pradesh	Farrukhabad	SHAMSABAD	79.44043	27.53628	220
3212	Uttar Pradesh	Fatehpur	MALWAN	80.65089	26.10788	100
3213	Uttar Pradesh	Firozabad	KHAIRGARH(Hathwant)	78.50343	27.2286	53
3214	Uttar Pradesh	Firozabad	NARKHI	78.40676	27.29168	167
3215	Uttar Pradesh	G.B.Nagar	BISRAKH	77.37709	28.58839	109
3216	Uttar Pradesh	Gautam Buddha Nagar	Zewar	77.60769	28.13596	70
3217	Uttar Pradesh	Ghazipur	Birno	83.4847	25.7509	64

S.No.	State	District	Location	Long	Lat	NO3
3218	Uttar Pradesh	Ghazipur	Jakhaniya	83.3724	25.7425	58.5
3219	Uttar Pradesh	Ghazipur	Mardah	83.5595	25.8039	81
3220	Uttar Pradesh	Gorakhpur	BRAHMPUR	83.56379	26.54857	45
3221	Uttar Pradesh	Hamirpur	Rath	79.57604	25.59904	403
3222	Uttar Pradesh	Hamirpur	Sarila	79.67901	25.77548	103
3223	Uttar Pradesh	Hardoi	Pihani	80.20581	27.6219	49
3224	Uttar Pradesh	Hathras	HASSAIN	78.26747	27.61204	117
3225	Uttar Pradesh	Hathras	HATHRAS	78.05509	27.57298	171
3226	Uttar Pradesh	Hathras	SADABAD	78.04008	27.44663	192
3227	Uttar Pradesh	Hathras	SASNI	78.07405	27.69113	64
3228	Uttar Pradesh	J P Nagar	Gajraula	78.24361	28.83778	92
3229	Uttar Pradesh	J P Nagar	Hasanpur	78.2825	28.73083	87
3230	Uttar Pradesh	Jalaun	Kuthond	79.41755	26.36139	96
3231	Uttar Pradesh	Jalaun	Rampura	79.1841	26.34813	82
3232	Uttar Pradesh	Jhansi	Bangra	79.00397	25.31135	114
3233	Uttar Pradesh	Jhansi	Mauranipur	79.14685	25.25767	171
3234	Uttar Pradesh	Kanpur Dehat	Amraudha	79.78303	26.19375	56
3235	Uttar Pradesh	Kanpur Dehat	Sandalp ur	79.6755	26.4223	45
3236	Uttar Pradesh	Kanpur Nagar	Kalyanp ur	80.28565	26.56602	45
3237	Uttar Pradesh	Kanpur Nagar	Kalyanp ur	80.25477	26.5042	50
3238	Uttar Pradesh	Kanpur Nagar	Patara	80.19659	26.23339	60
3239	Uttar Pradesh	Kanpur Nagar	Shivrajp ur	80.14112	26.68648	45
3240	Uttar Pradesh	Kasganj	PATIIYALI	78.99999	27.69195	175
3241	Uttar Pradesh	Kasganj	SORON	78.75189	27.89049	128
3242	Uttar Pradesh	Kaushambi	CHAIL	81.6296	25.426	65
3243	Uttar Pradesh	Kaushambi	KARA	81.3598	25.6952	215
3244	Uttar Pradesh	Kaushambi	MOORAT GANJ	81.5384	25.5548	240
3245	Uttar Pradesh	Kaushambi	SIRATHU	81.319	25.647	47
3246	Uttar Pradesh	Lakhimpur Kheri	Bankeyganj	80.41387	28.15563	49
3247	Uttar Pradesh	Lalitpur	Jakhaura	78.33913	24.89607	52
3248	Uttar Pradesh	Lalitpur	Mehrauni	78.72488	24.5769	124
3249	Uttar Pradesh	Lucknow	Chinhat	80.975	26.8806	69
3250	Uttar Pradesh	Mahoba	Jaitpur	79.56593	25.2553	80
3251	Uttar Pradesh	Mahoba	Kabrai	79.89443	25.29861	135
3252	Uttar Pradesh	Mainpuri	KATRA SAMAN	79.1982	27.03046	61
3253	Uttar Pradesh	Mainpuri	KUSMURA	79.2849	27.10311	122
3254	Uttar Pradesh	Mainpuri	MAINPURI	79.04922	27.23941	51
3255	Uttar Pradesh	Mathura	Lohaban	77.72932	27.50069	45
3256	Uttar Pradesh	Mathura	MAT	77.71605	27.63071	325
3257	Uttar Pradesh	Mathura	NOHJHIL	77.64946	27.84581	480
3258	Uttar Pradesh	Mathura	RAYA	77.7848	27.54948	56
3259	Uttar Pradesh	Mirzapur	Chanbey	82.39389	25.12722	145
3260	Uttar Pradesh	Mirzapur	Mirza-pur HQ	82.56722	25.13389	114
3261	Uttar Pradesh	Mirzapur	Pahari	82.73972	25.08472	62
3262	Uttar Pradesh	Muzaffarnagar	Budhana	77.47222	29.28972	57
3263	Uttar Pradesh	Muzaffarnagar	Charthawal	77.58556	29.54583	48
3264	Uttar Pradesh	Pratapgarh	KUNDA	81.5147	25.7207	49
3265	Uttar Pradesh	Raibareli	HARICHANDPUR	81.16182	26.34467	54
3266	Uttar Pradesh	Raibareli	SARTAWAN	81.09331	26.27087	70
3267	Uttar Pradesh	Rampur	Shahabad	79.01111	28.56306	80
3268	Uttar Pradesh	Sambhal	Bania Khera	78.78333	28.46167	63
3269	Uttar Pradesh	Sambhal	Gunnaur	78.44278	28.19528	49
3270	Uttar Pradesh	Shamli	Un	77.24556	29.57833	48
3271	Uttar Pradesh	Siddharth Nagar	Lotan	83.2417	27.29	115
3272	Uttar Pradesh	Unnao	Safipur	80.34806	26.74007	49
3273	Uttar Pradesh	Varanasi	Kashi Vidya Peeth	82.96278	25.30639	50
3274	Uttarakhand	Almora	DharaNaula	79.6764	29.5708	90

S.No.	State	District	Location	Long	Lat	NO3
3275	Uttarakhand	Almora	DharaNaula	79.6764	29.5708	90
3276	Uttarakhand	Haridwar	Bhikampur	78.1417	29.75	64
3277	Uttarakhand	Haridwar	Bhikampur	78.1417	29.75	64
3278	Uttarakhand	Haridwar	Dhanpura	78.1144	29.845	98
3279	Uttarakhand	Haridwar	Dhanpura	78.1144	29.845	98
3280	Uttarakhand	Uttarkashi	Du0a	78.3494	30.6844	54
3281	Uttarakhand	Uttarkashi	Du0a	78.3494	30.6844	54
3282	West Bengal	Alipurduar	Falakata	89.1981	26.5144	47
3283	West Bengal	Alipurduar	Hasimara	89.3497	26.7247	59
3284	West Bengal	Bankura	Bankura	87.0654	23.2286	51
3285	West Bengal	Bankura	Benajira	87.0678	23.1767	63
3286	West Bengal	Bankura	Chhatna	86.969	23.3074	45
3287	West Bengal	Bankura	Dakshin Sole	87.1334	23.0046	48
3288	West Bengal	Bankura	Gholkunda	87.0501	23.0904	58
3289	West Bengal	Bankura	Karoasole	86.9222	23.348	64
3290	West Bengal	Bankura	Kharkasuli	87.3203	23.0333	50
3291	West Bengal	Bankura	Kusthalia	87.0475	23.4784	50
3292	West Bengal	Bankura	Ledhapalash	86.948	23.5075	94
3293	West Bengal	Bankura	Siromanipur	87.3471	23.0532	53
3294	West Bengal	Bankura	Sonamukhi	87.4111	23.3018	55
3295	West Bengal	Birbhum	Barjal	87.7068	24.153	50
3296	West Bengal	Birbhum	Hatjanbazar	87.5317	23.8842	55
3297	West Bengal	Birbhum	Loha Bazar 1	87.5725	23.9842	46
3298	West Bengal	Birbhum	Muluk	87.7206	23.6526	59
3299	West Bengal	Birbhum	Nasipur	87.7608	24.2932	48
3300	West Bengal	Birbhum	Rajnagar	87.6705	22.577	58
3301	West Bengal	Birbhum	Seorakuri 3	87.5533	23.9778	53
3302	West Bengal	Coochbehar	Chilakhana (Palpara)	89.5883	26.3067	59
3303	West Bengal	Coochbehar	Dhaprahat	88.9867	26.2744	63
3304	West Bengal	Coochbehar	Panishla	88.9447	26.4419	58
3305	West Bengal	Darjeeling	Ambarimore	88.2792	26.5736	51
3306	West Bengal	Darjeeling	Bagdogra	88.3172	26.6975	47
3307	West Bengal	Darjeeling	Baneswar	82.0308	26.0322	52
3308	West Bengal	Darjeeling	Gangaram Tea Garden	88.3083	26.6319	53
3309	West Bengal	Darjeeling	KALARAM GHOSH PARA	88.2772	26.5894	53
3310	West Bengal	Darjeeling	Siliguri	88.4267	26.705	53
3311	West Bengal	Darjeeling	Tuta Pakri Basti (Bakuline)	88.3133	26.5875	53
3312	West Bengal	Hugli	Champta	88.3402	23.0725	61
3313	West Bengal	Hugli	Guptipara	88.4086	23.2061	55
3314	West Bengal	Hugli	Inchura	88.0686	23.1366	56
3315	West Bengal	Jalpaiguri	Kalinagar	88.5072	26.5558	53
3316	West Bengal	Jalpaiguri	Madhaboanga	88.8072	26.5506	59
3317	West Bengal	Jalpaiguri	New Salbarihat	89.1056	26.5442	47
3318	West Bengal	Murshidabad	Kuptala	88.5969	24.2572	46
3319	West Bengal	Murshidabad	Paranpur	88.5716	24.2689	47
3320	West Bengal	Nadia	Bahadurpur	88.4633	23.4392	183
3321	West Bengal	Nadia	Nabadwipghat	88.3842	23.4122	147
3322	West Bengal	Paschim Bardhaman	Chittaranjan	86.9028	23.8464	58
3323	West Bengal	Paschim Bardhaman	Damodarapur	87.0839	23.7042	58
3324	West Bengal	Paschim Bardhaman	DignataAndal	87.1975	23.5861	58
3325	West Bengal	Paschim Bardhaman	DOBRANA (New kenda)	87.1747	23.6783	52
3326	West Bengal	Paschim Bardhaman	Gaighata	87.2636	23.7078	52
3327	West Bengal	Paschim Bardhaman	Gamon Colony	87.2403	23.5669	55
3328	West Bengal	Paschim Bardhaman	Gopalmath	87.2306	23.5736	55
3329	West Bengal	Paschim Bardhaman	Silampur (New)	87.435	23.4156	56
3330	West Bengal	Paschim Bardhaman	Ukhra	87.2358	23.6531	53

S.No.	State	District	Location	Long	Lat	NO3
3331	West Bengal	Purba Barddhaman	Raipur	87.9583	23.2383	50
3332	West Bengal	Purulia	Anara	86.5647	23.4913	58
3333	West Bengal	Purulia	Dadki	86.6771	23.1779	58
3334	West Bengal	Purulia	Damodarpur	86.6664	23.2073	58
3335	West Bengal	Purulia	Dava	86.1393	23.1043	55
3336	West Bengal	Purulia	Dhabani	86.4462	22.9269	47
3337	West Bengal	Purulia	Dhobakata	86.3775	23.3334	59
3338	West Bengal	Purulia	Dubra	86.518	23.5435	55
3339	West Bengal	Purulia	Durgu	86.0127	23.3854	74
3340	West Bengal	Purulia	Gobag	86.7627	23.592	59
3341	West Bengal	Purulia	Joypur	86.143	23.4172	59
3342	West Bengal	Purulia	Kashiberia	86.5491	23.5441	66
3343	West Bengal	Purulia	Khudiyara	86.6305	22.9899	54
3344	West Bengal	Purulia	Kulgara	86.5854	23.322	58
3345	West Bengal	Purulia	Lalpur	86.6312	23.3019	53
3346	West Bengal	Purulia	Podala Road	86.4002	23.3695	58
3347	West Bengal	Purulia	Tamna	86.351	23.2736	59
3348	West Bengal	South 24 Parganas	Dostipur	88.2022	22.2706	48

Annexure-V**Locations Having Iron > 1.0 mg/L in Ground Water in Different States/UT of India (NHS 2019-20)**

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1	Andaman & Nicobar Islands	N&M Andaman	Kishorinagar (Parangara)	92.8817	13.1650	1.71
2	Andaman & Nicobar Islands	South Andaman	Wrightmyo	92.7094	11.7811	1.34
3	Andhra Pradesh	Ananthapur	A Roppam-Pz	77.2736	14.0267	1.73
4	Andhra Pradesh	Ananthapur	Aladahalli-Pz	77.0444	14.0469	1.56
5	Andhra Pradesh	Ananthapur	Budipalli	77.1667	13.9667	1.15
6	Andhra Pradesh	Ananthapur	Bullasamudram-Pz	77.3203	13.9278	1.75
7	Andhra Pradesh	Ananthapur	Dharmavaram	77.7200	14.4117	1.50
8	Andhra Pradesh	Ananthapur	Hottebetta-Pz	77.1597	13.8814	1.00
9	Andhra Pradesh	Ananthapur	KallumarriAQ1-Pz	77.3808	13.8781	8.71
10	Andhra Pradesh	Ananthapur	Kanchisamudram-DW13	77.6083	13.8000	1.46
11	Andhra Pradesh	Ananthapur	Kundurpi-DW14	77.0500	14.3000	1.24
12	Andhra Pradesh	Ananthapur	Manesamudram-Pz	77.5308	13.8794	2.29
13	Andhra Pradesh	Ananthapur	Muthyalacherevu Poolabhavi-DW14	78.1000	14.1000	2.05
14	Andhra Pradesh	Ananthapur	Palasamudram	77.7314	13.9728	1.00
15	Andhra Pradesh	Ananthapur	RollaAqII-PZ	77.1039	13.8392	1.26
16	Andhra Pradesh	Ananthapur	Valasa Agraharam-Pz	76.9044	14.1403	3.64
17	Andhra Pradesh	Ananthapur	Waddipalli	77.4583	14.6717	1.03
18	Andhra Pradesh	Chittoor	Penumuru-PZ	79.1956	13.3644	1.96
19	Andhra Pradesh	East Godavari	Antarvedi 2013DW	81.7333	16.3672	1.57
20	Andhra Pradesh	East Godavari	Bandurlanka-DW13	82.2139	16.7303	1.08
21	Andhra Pradesh	East Godavari	Chaviti Tibalu-DW14	81.9856	17.6186	1.51
22	Andhra Pradesh	East Godavari	Chintur	81.3942	17.7456	30.67
23	Andhra Pradesh	East Godavari	Dowalaiswaram - PZ3	81.7889	16.9261	1.35
24	Andhra Pradesh	East Godavari	Kakinada-ii	82.2375	16.9500	2.43
25	Andhra Pradesh	East Godavari	Kattipudi	82.3339	17.2422	2.24
26	Andhra Pradesh	East Godavari	Malikipuram 2013DW	81.8000	16.8014	8.36
27	Andhra Pradesh	East Godavari	Samalkot-DW	82.1644	17.0453	1.08
28	Andhra Pradesh	East Godavari	Sitapalli	81.8333	17.3500	2.00
29	Andhra Pradesh	Guntur	Amravathi-Dw	80.3600	16.5750	1.31
30	Andhra Pradesh	Guntur	Brahmanapally-Dw	79.8361	16.5497	1.92
31	Andhra Pradesh	Guntur	Budampadu-Dw	80.4744	16.2600	2.77
32	Andhra Pradesh	Guntur	Cheruvu Jamulapalem	80.4450	15.9339	1.08
33	Andhra Pradesh	Guntur	Guttikonda	79.8361	16.4278	1.71
34	Andhra Pradesh	Guntur	Ipur	79.7764	16.2236	1.01
35	Andhra Pradesh	Guntur	Kocherla	79.7589	16.1489	1.15
36	Andhra Pradesh	Guntur	Mandadi	79.4069	16.4069	1.24
37	Andhra Pradesh	Guntur	Mannevaripalem-Dw	80.6100	15.9900	2.85
38	Andhra Pradesh	Guntur	Nekarikallu2	79.9500	16.3667	1.40
39	Andhra Pradesh	Guntur	Pallapatla-Dw	80.7600	15.9700	1.55
40	Andhra Pradesh	Guntur	Phanidharam	80.3967	16.3606	2.08
41	Andhra Pradesh	Guntur	Ponnekallu	80.4019	16.4044	2.73

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
42	Andhra Pradesh	Guntur	Prattipadu	80.3333	16.1667	2.86
43	Andhra Pradesh	Guntur	Punnappalle-DW14	80.6975	16.0569	2.13
44	Andhra Pradesh	Guntur	Ravela	80.3486	16.4181	3.65
45	Andhra Pradesh	Guntur	Rentachintala	79.5494	16.5517	1.14
46	Andhra Pradesh	Guntur	Rompicherla	79.9092	16.2236	2.39
47	Andhra Pradesh	Guntur	Satlur	80.1153	16.2494	1.01
48	Andhra Pradesh	Guntur	Sattenapalle-DW14	80.1481	16.4064	1.22
49	Andhra Pradesh	Guntur	Tadikonda-Dw	80.4522	16.4164	1.62
50	Andhra Pradesh	Guntur	Thulluru-Dw	80.4669	16.5292	2.10
51	Andhra Pradesh	Guntur	Thummalacheruvu	79.7989	16.5256	1.31
52	Andhra Pradesh	Guntur	Ungutur	80.3078	16.3392	1.03
53	Andhra Pradesh	Guntur	Vadlamudi	80.5403	16.2667	1.09
54	Andhra Pradesh	Guntur	Varagami	80.3083	16.0764	1.20
55	Andhra Pradesh	Guntur	Vellatur	79.6506	16.1194	1.52
56	Andhra Pradesh	Guntur	Vinukonda	79.7483	16.0533	1.17
57	Andhra Pradesh	Guntur	Vykuntapuram	80.4128	16.5661	3.03
58	Andhra Pradesh	Kadapa	Alludupally	78.7000	14.7167	1.52
59	Andhra Pradesh	Kadapa	Ayyavaripalli-pz	78.4944	14.5331	2.62
60	Andhra Pradesh	Kadapa	Bodivaripally-pz	78.2517	14.6214	1.35
61	Andhra Pradesh	Kadapa	Chaudarivaripalli DW13	78.9233	14.9072	1.94
62	Andhra Pradesh	Kadapa	Chinnamandyam	78.7008	13.9456	1.89
63	Andhra Pradesh	Kadapa	Jammalamadugu-DW14	78.3822	14.8444	3.62
64	Andhra Pradesh	Kadapa	Laxmipet-pz	78.6931	14.7200	7.34
65	Andhra Pradesh	Kadapa	Mittamidipally-PZ	78.6942	14.4683	9.93
66	Andhra Pradesh	Kadapa	Mylavaram-PZ	78.3419	14.8578	2.12
67	Andhra Pradesh	Kadapa	Pathur DW13	78.7750	14.6472	3.12
68	Andhra Pradesh	Kadapa	Pujarivandlapally-Pz	78.9444	14.0750	12.66
69	Andhra Pradesh	Kadapa	Pullareddypet	78.5981	14.8456	2.10
70	Andhra Pradesh	Kadapa	Yanadipalli-OWII-AQ-I	79.3881	13.8814	1.16
71	Andhra Pradesh	Kadapa	Yerraguntla-pz	78.5394	14.6303	8.32
72	Andhra Pradesh	Krishna	Bapulapadu-PZ 1	80.9625	16.6458	3.43
73	Andhra Pradesh	Krishna	Kottareddigudem-DW14	80.7414	16.8767	1.26
74	Andhra Pradesh	Krishna	Maripalem (Nagayalanka)	80.9231	15.9483	1.03
75	Andhra Pradesh	Krishna	Tiruvur	80.6083	17.1083	32.15
76	Andhra Pradesh	Kurnool	Aluru1	77.2244	15.4008	2.21
77	Andhra Pradesh	Kurnool	Atmakur (alt)	78.5917	15.8917	6.24
78	Andhra Pradesh	Kurnool	Kurnool-IMD-PZ	78.0397	15.8056	3.44
79	Andhra Pradesh	Kurnool	Nossam	78.4000	14.9917	2.07
80	Andhra Pradesh	Kurnool	Pathupadu-PZ	78.1600	15.2556	4.04
81	Andhra Pradesh	Kurnool	Podalakunta-DW14	77.1208	15.8542	7.14
82	Andhra Pradesh	Nellore	Venkatachalam-r	79.9292	14.3117	1.54
83	Andhra Pradesh	Prakasam	Darsi 2011pz	79.6847	15.7708	2.47
84	Andhra Pradesh	Prakasam	Tadivaripalli 2011pz	79.2761	15.5897	32.64
85	Andhra Pradesh	Srikakulam	Gotta-DW13	83.9722	18.6889	1.12
86	Andhra Pradesh	Vizianagaram	Garividi DW13	83.5286	18.2803	2.83
87	Andhra Pradesh	Vizianagaram	Kanimetta	83.5944	18.1217	23.70
88	Andhra Pradesh	Vizianagaram	Maradam	83.3383	18.4033	1.15
89	Andhra Pradesh	Vizianagaram	Natavalasa	83.5292	18.0625	1.87
90	Andhra Pradesh	West Godavari	Chityala-DW14	81.5939	17.0931	1.93
91	Andhra Pradesh	West Godavari	Eluru-DW13	81.1106	16.7108	1.99

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
92	Andhra Pradesh	West Godavari	Narsimhapuram-DW14	81.5019	16.5583	1.98
93	Andhra Pradesh	West Godavari	Recharla -PZ	81.0181	17.1222	4.47
94	Andhra Pradesh	West Godavari	Sarepalle-DW14	81.4656	16.6886	1.05
95	Assam	Cachar	Razabazar	93°03'53.0"	24°52'20.9"	2.57
96	Assam	Dibrugarh	Domar Dolong TW	94.9511	27.2148	9.29
97	Assam	Jorhat	Cinemora	94°13'58"	26°42'33"	1.38
98	Assam	Jorhat	Kokilamukh	94°10'04"	26°49'10"	5.68
99	Assam	Jorhat	Kunwari Pukhuri	94°12'26"	26°41'54"	2.60
100	Assam	Kamrup	Hajo	91°31'39.3"	26°15'05.6"	2.23
101	Assam	Karimganj	Dhaulia	92°21'44.2"	24°37'26.6"	1.25
102	Assam	Nagaon	Balijuri	92°50'59"	26°19'34"	1.30
103	Assam	Nagaon	Phulaguri	92°35'9"	26°16'02"	9.12
104	Assam	Sibsagar	Gorgaon	94° 44'39"	26°55'48.54"	8.53
105	Assam	Tinsukia	Borgolai	95.6250	27.2917	10.19
106	Assam	Tinsukia	Tinsukia	95.3519	27.4849	1.36
107	Assam	Tinsukia	Tipong	95.8553	27.3156	2.16
108	Assam	Udalguri	Hatitopagaon	92.3100	26.7653	1.88
109	Bihar	Araria	Bhargama	87.1500	26.0500	4.41
110	Bihar	Araria	Palasi	87.5700	26.2500	8.61
111	Bihar	Araria	Raniganj	87.2300	26.0700	4.15
112	Bihar	Banka	Barahat	87.0200	24.8800	1.05
113	Bihar	Banka	Baunsi	87.0300	24.8000	1.68
114	Bihar	Banka	Chandan	86.6900	24.6400	3.92
115	Bihar	Banka	Katuria	86.7300	24.7500	1.61
116	Bihar	Begusarai	Badalpura	86.1500	25.3800	2.64
117	Bihar	Begusarai	Barun'0'	85.9700	25.4600	2.89
118	Bihar	Begusarai	Begusarai	86.0300	25.4500	4.94
119	Bihar	Begusarai	Choti Balia	86.3100	25.4300	1.72
120	Bihar	Begusarai	Gopalpur	86.2000	25.4400	2.35
121	Bihar	Begusarai	Haridia	86.1400	25.4500	1.86
122	Bihar	Begusarai	Heera tola	86.4400	25.4600	2.46
123	Bihar	Begusarai	Kaithma	86.1500	25.3900	5.25
124	Bihar	Begusarai	Kumarshan	85.8600	25.5400	6.66
125	Bihar	Begusarai	Kumbhidera	86.0600	25.6500	1.42
126	Bihar	Begusarai	Maithani	86.1300	25.4300	3.72
127	Bihar	Begusarai	Mohanpur Usrai	86.1300	25.5100	4.94
128	Bihar	Begusarai	Naya Nahar, Dularpur	85.9200	25.5100	2.68
129	Bihar	Begusarai	New Jafar Nagar	86.3800	25.4300	3.00
130	Bihar	Begusarai	Pokharia	86.2500	25.4100	1.85
131	Bihar	Begusarai	Raghunathpura	86.4400	25.4400	1.10
132	Bihar	Begusarai	Simri	86.2200	25.6000	2.60
133	Bihar	Begusarai	Teghra	85.9500	25.4800	7.95
134	Bihar	BHABUA	Chainpur	83.4600	25.0700	1.29
135	Bihar	BHABUA	Chand	83.4000	25.1100	1.08
136	Bihar	BHABUA	Karmanasa	83.4400	25.2400	10.09
137	Bihar	BHABUA	Mohania	83.6200	25.1700	1.98
138	Bihar	BHABUA	Saraiya	83.5700	24.9800	2.05
139	Bihar	BHABUA	Tori f.ck.post	83.6300	24.9800	1.39
140	Bihar	Bhagalpur	Jagnathpur	87.2800	25.2600	1.10
141	Bihar	Bhagalpur	Madrauni Chowk	87.1700	25.4000	5.25

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
142	Bihar	Bhagalpur	Pirpainti	87.4300	25.3100	7.06
143	Bihar	BHOJPUR	Balua	84.5600	25.4900	2.49
144	Bihar	BHOJPUR	Birampur	84.7200	25.6000	2.51
145	Bihar	BHOJPUR	Giddha	84.7500	25.5900	1.36
146	Bihar	BHOJPUR	Inglishpur	84.7800	25.6500	1.46
147	Bihar	BHOJPUR	Jagatpur	84.6000	25.6700	1.26
148	Bihar	BHOJPUR	Jarawarpur Milki	84.5300	25.6000	1.54
149	Bihar	BHOJPUR	Karnempur	84.3600	25.6700	8.43
150	Bihar	BHOJPUR	Simariya	84.7200	25.6700	3.71
151	Bihar	BHOJPUR	songhata	84.7600	25.6100	2.97
152	Bihar	BUXAR	Bagen Bazar	84.2900	25.5000	1.73
153	Bihar	BUXAR	Barhampur	84.3100	25.6000	1.37
154	Bihar	BUXAR	Danikutia	83.9300	25.5500	11.34
155	Bihar	BUXAR	Dudharchak	84.0600	25.6200	1.18
156	Bihar	BUXAR	Durasan	84.1700	25.6100	3.33
157	Bihar	BUXAR	Karathar	84.1800	25.6500	3.04
158	Bihar	BUXAR	Kritpur	83.9400	25.5500	3.43
159	Bihar	BUXAR	Manikpur	84.0900	25.6700	5.43
160	Bihar	BUXAR	Mishrvalia	83.9100	25.5300	1.83
161	Bihar	BUXAR	Neazipur	84.1400	25.6800	6.73
162	Bihar	E Champaran	Bairiya Bazar	84.8400	26.6100	3.62
163	Bihar	E.Champaran	Dubey Tola	84.7600	26.5300	1.97
164	Bihar	E.Champaran	Dumaria	84.7400	26.3900	1.82
165	Bihar	E.Champaran	Ghorasahan	85.1400	26.8200	9.22
166	Bihar	E.Champaran	Murarpur	84.8100	26.6000	2.76
167	Bihar	E.Champaran	Nawada	84.8900	26.6500	1.54
168	Bihar	E.Champaran	Patahi	85.1700	26.5800	1.79
169	Bihar	E.Champaran	Sugauli Bazar	84.9500	26.9200	1.17
170	Bihar	E.Champaran	Uttari Gavandra	85.0600	26.4100	1.69
171	Bihar	Gaya	Chand chowri Chowk	85.0000	24.7700	1.25
172	Bihar	Gopalganj	Bangra	84.4500	26.3800	1.23
173	Bihar	Gopalganj	BangraDeoria	84.4500	26.3800	1.89
174	Bihar	Gopalganj	Bishambarpur	84.4800	26.3500	1.92
175	Bihar	Gopalganj	Kuchaikot	84.3300	26.5600	1.32
176	Bihar	Gopalganj	Phulwariya	84.5200	26.4000	1.77
177	Bihar	Jamui	Ambedkar Nagar	86.3600	24.7900	1.93
178	Bihar	Jamui	Jamui	86.1600	24.9300	1.32
179	Bihar	Jamui	Purna Khaira	86.2000	24.8700	6.03
180	Bihar	Katihar	Bastaul 1	87.6700	25.5000	2.93
181	Bihar	Katihar	Katihar	87.6000	25.5400	2.62
182	Bihar	Katihar	Khiria	87.4600	25.6100	1.34
183	Bihar	Katihar	Kursela	87.2400	25.4400	1.34
184	Bihar	Katihar	Narahaiya	87.2500	25.5000	1.38
185	Bihar	Katihar (Purnea)	Mahendrapur	87.2500	25.5000	9.47
186	Bihar	Khagaria	Basantpur	86.5900	25.5000	4.12
187	Bihar	Khagaria	Chautham	86.6800	25.5500	11.24
188	Bihar	Khagaria	Jamalpur (Gogri Jamalpur)	86.6400	25.4300	8.80
189	Bihar	Khagaria	Kasimpur	86.4200	25.5000	2.90
190	Bihar	Khagaria	Khagaria	86.4800	25.4900	3.15
191	Bihar	Khagaria	Labhgaon	86.4300	25.5000	3.20
192	Bihar	Khagaria	Lohia Chowk Maheshkhunt	86.6000	25.4800	1.72
193	Bihar	Khagaria	Maheshkhunt -1	86.6400	25.4600	3.37
194	Bihar	Khagaria	Ranko	86.5000	25.5200	3.99

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
195	Bihar	Kishanganj	Bahadurganj	87.8400	26.2600	2.64
196	Bihar	Kishanganj	Kaswa Kaliganj	88.1400	26.3500	2.62
197	Bihar	Kishanganj	Kochadhamin	87.7700	26.1500	8.79
198	Bihar	Kishanganj	Teragachhi	87.6800	26.3700	3.45
199	Bihar	Lakhisarai	Rishi Paharpur	86.2900	25.2800	7.54
200	Bihar	Madhepura	Barhari	86.8100	26.0800	5.30
201	Bihar	Madhepura	Ganeshpur	86.9800	25.5900	1.32
202	Bihar	Madhepura	Gaushala Chowk	86.9400	25.5900	1.04
203	Bihar	Madhepura	Ghailarh	86.4100	25.5800	5.29
204	Bihar	Madhepura	Murliganj	86.9800	25.8800	2.29
205	Bihar	Madhepura	Rampur	86.9400	25.8900	5.65
206	Bihar	Madhepura	Singheswar	86.8200	25.9900	10.62
207	Bihar	Madhepura	Uda Kishanganj	86.9500	25.6800	1.72
208	Bihar	MADHUBANI	Benipatti	85.9700	26.4600	1.65
209	Bihar	MADHUBANI	Jhanjharpur	86.2800	26.2700	1.75
210	Bihar	MADHUBANI	Jogiya	86.2100	26.5800	2.75
211	Bihar	MADHUBANI	Phulparas	86.1000	26.2600	3.26
212	Bihar	MADHUBANI	Siswar	86.4600	26.4200	4.95
213	Bihar	MADHUBANI	Thantola	86.1100	26.5100	2.89
214	Bihar	Munger	Gangta Morh	86.5100	25.0400	13.69
215	Bihar	Munger	Rampur	86.6300	25.0300	6.09
216	Bihar	Munger	Tarapur	86.5000	25.1000	1.99
217	Bihar	Muzaffarpur	Dewaria	85.5500	26.1100	4.09
218	Bihar	Muzaffarpur	Gargalia (Minapur)	85.3500	26.0500	2.07
219	Bihar	Muzaffarpur	Jaffarpur (Bichala tola)	85.3500	26.0300	1.47
220	Bihar	Muzaffarpur	Paroo	85.1400	26.2800	3.81
221	Bihar	Muzaffarpur	Parwal Patti Baraun.	85.5900	26.0000	3.08
222	Bihar	Muzaffarpur	Rajwara	85.3900	26.1400	2.64
223	Bihar	Muzaffarpur	Sarfuddin-pur,(Bawan Bigha)	84.9300	26.3000	2.44
224	Bihar	Muzaffarpur	Shukrahat (Maidapur)	84.9500	26.3000	3.49
225	Bihar	Nalanda	Bhui	85.4200	25.1100	1.52
226	Bihar	Nalanda	Bihar Sharif (Rly Stn)	85.5400	25.2000	1.15
227	Bihar	Nalanda	Daudpur	85.4600	25.2100	1.02
228	Bihar	Nalanda	Doiya	85.5000	25.2300	1.06
229	Bihar	Nalanda	Hilsa	85.2900	25.3000	1.57
230	Bihar	Nalanda	Islampur	85.2100	25.1400	2.39
231	Bihar	Nalanda	Jangipur	85.6900	25.2000	1.38
232	Bihar	Nalanda	Nalanda	85.4500	25.1400	1.83
233	Bihar	Nalanda	Papanhosa	85.4300	25.1800	1.44
234	Bihar	Nalanda	Rajgir	85.4000	25.0200	1.60
235	Bihar	Nalanda	Ranabigha	85.5100	25.1700	1.41
236	Bihar	Nalanda	Sare	85.6800	25.2100	3.49
237	Bihar	Nalanda	Sarmera	85.8000	25.2600	1.16
238	Bihar	Nalanda	Sohdh	85.5100	25.2300	3.62
239	Bihar	Nalanda	Vena	85.5300	25.3200	3.46
240	Bihar	Nawada	Bishunpur	85.6700	24.7500	8.21
241	Bihar	Nawada	Kawakol Ashram	85.8800	24.8500	2.22
242	Bihar	Nawada	Shahpur Morh	85.5700	25.0200	2.73
243	Bihar	Nawada	Tungi	85.5700	24.8100	2.48
244	Bihar	Patna	Arap	84.9000	25.4900	1.31
245	Bihar	Patna	Bakhtiarpur	85.5300	25.4600	1.03
246	Bihar	Patna	Hulas Chak	85.0300	25.5400	25.80

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
247	Bihar	Patna	Lalbegam	84.9800	25.6500	1.63
248	Bihar	Patna	Snehitola	85.7300	25.5100	3.84
249	Bihar	Purnea	Amour	87.7200	25.9700	8.74
250	Bihar	Purnea	Bansbari	87.7100	25.9600	8.44
251	Bihar	Purnea	Chadia(Chariya)	87.7900	25.8600	2.85
252	Bihar	Purnea	Dargaha(Supauli Sthan)	87.1600	25.6000	1.37
253	Bihar	Purnea	Dhamdaha	87.2100	25.7500	9.10
254	Bihar	Purnea	Kajha	87.2700	25.7700	1.31
255	Bihar	Purnea	Purnea	87.5100	25.7800	3.19
256	Bihar	Purnea	Ranipatra	87.5100	25.7300	5.30
257	Bihar	ROHTAS	`CARBINDIA	84.1800	24.9500	1.95
258	Bihar	ROHTAS	AKBARPUR	83.9500	24.6600	1.59
259	Bihar	ROHTAS	Amawan Gate	84.0000	24.9400	11.60
260	Bihar	ROHTAS	Auraiya	83.8800	24.5700	1.09
261	Bihar	ROHTAS	Sasaram	84.0300	24.9600	1.60
262	Bihar	Saharsa	Bangaon	86.5400	25.8600	3.65
263	Bihar	Saharsa	Basudeva	86.6100	25.8700	24.14
264	Bihar	Saharsa	Chainpura	86.5200	25.8300	22.17
265	Bihar	Saharsa	Jamunia	86.5600	25.7600	12.83
266	Bihar	Saharsa	Patodi Bazar	86.5500	25.9800	10.28
267	Bihar	Saharsa	Saharsa 1	86.5300	25.8900	1.52
268	Bihar	Saharsa	Simri Bakhtiarpur	86.5900	25.7200	2.31
269	Bihar	Saharsa	Simri Bakhtiarpur-1	86.6100	25.7300	2.50
270	Bihar	Samastipur	Basudebpur	85.7700	25.9100	4.94
271	Bihar	Samastipur	Jakhra	85.8400	26.0000	1.07
272	Bihar	Samastipur	Madudabad	85.7100	25.5900	1.01
273	Bihar	Saran	Aami	84.9600	25.7400	1.80
274	Bihar	Saran	Chapra	84.7100	25.7800	1.01
275	Bihar	Saran	Ekma	84.5500	25.9700	2.55
276	Bihar	Saran	Nayagaon	85.0900	25.7600	3.52
277	Bihar	Seikhpura	Koeri Bigha	85.7400	25.2200	1.34
278	Bihar	Seikhpura	Nemdarganj	85.7900	25.1700	1.35
279	Bihar	SHEOHAR	Ganeshpur	85.3000	26.5100	3.28
280	Bihar	SHEOHAR	Sarbarpur	85.3200	26.4300	1.62
281	Bihar	SITAMARHI	Bhutahi	85.5500	26.7300	1.26
282	Bihar	Sitamarhi	Sitamarhi	85.5000	26.4900	1.06
283	Bihar	Siwan	Chimanpur (Belamore)	84.6700	26.2200	1.06
284	Bihar	SUPAUL	Balua 1	87.0100	26.4000	1.06
285	Bihar	SUPAUL	Birpur	86.6000	26.1000	2.06
286	Bihar	SUPAUL	Malhani	86.5600	26.0700	1.21
287	Bihar	SUPAUL	Parsarma	86.8400	26.3300	2.67
288	Bihar	SUPAUL	Pratapganj	86.9400	26.3000	7.16
289	Bihar	SUPAUL	Station Rd	86.6100	26.1200	1.10
290	Bihar	SUPAUL	Supaul	86.6100	26.1200	5.33
291	Bihar	Vaishali	Baksama	85.3800	25.8800	1.01
292	Bihar	Vaishali	Bhaluhia	85.2900	25.9200	2.38
293	Bihar	Vaishali	Mahnar	85.5200	25.6000	2.25
294	Bihar	Vaishali	Mahua1	85.4200	25.8300	1.15
295	Bihar	Vaishali	Sahdal Buzurg	85.4600	24.6600	2.73
296	Bihar	W Champaran	Shishwania	84.3600	27.0000	1.24
297	Bihar	W. Champaran	Gurwalia	84.4400	26.9100	2.95
298	Bihar	W. Champaran	Lauria	84.4200	26.9800	2.16
299	Bihar	W. Champaran	Majhwalia (Guruchurwa)	84.6000	26.8000	2.06

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
300	Bihar	W. Champaran	Sabuni Pokhra(Ramnagar)	84.3400	27.1600	12.93
301	Chattisgarh	Balodabazar	Aouri	82.2667	21.4208	1.40
302	Chattisgarh	Balodabazar	Mudhipar	82.2833	21.4667	1.68
303	Chattisgarh	Balodabazar	Sarsiwa	82.9167	21.6250	1.79
304	Chattisgarh	Balodabazar	suhela	81.9739	21.6158	1.36
305	Chattisgarh	Balodabazar	Temri	82.4113	21.5758	1.37
306	Chattisgarh	Balrampur	Pasta	83.5250	23.4500	8.32
307	Chattisgarh	Bastar	Joba	81.7552	19.4449	2.10
308	Chattisgarh	Bastar	Lanjora	81.6542	19.7208	9.71
309	Chattisgarh	Bastar	Markel	82.1472	19.0639	13.63
310	Chattisgarh	Bilaspur	Chchgohana	82.0365	23.0196	2.96
311	Chattisgarh	Bilaspur	Dharhar	81.9642	22.9761	5.12
312	Chattisgarh	Bilaspur	Khaira	82.1407	22.3624	2.53
313	Chattisgarh	Bilaspur	Khamharia1	81.9875	22.1222	1.99
314	Chattisgarh	Bilaspur	Konchua	81.5846	22.2839	2.44
315	Chattisgarh	Bilaspur	Malhar	82.2858	21.8914	1.22
316	Chattisgarh	Bilaspur	Marwahi	82.0694	23.0200	2.87
317	Chattisgarh	Bilaspur	Nawapara	82.1218	22.4292	2.60
318	Chattisgarh	Bilaspur	Neora	81.9317	22.2125	1.11
319	Chattisgarh	Bilaspur	Panchpedi	82.2700	21.8281	1.15
320	Chattisgarh	Bilaspur	Pandri (Dhanwari Posa)	81.9955	22.9923	3.47
321	Chattisgarh	Bilaspur	Piperkhuti	81.8833	22.6639	1.03
322	Chattisgarh	Bilaspur	Saraipalli	81.9361	22.3417	2.49
323	Chattisgarh	Bilaspur	Saudhakhurd	82.0669	22.4972	2.57
324	Chattisgarh	Bilaspur	Seoni	81.9583	23.0125	4.63
325	Chattisgarh	Bilaspur	Tendumuda	82.0122	23.0581	3.14
326	Chattisgarh	Bilaspur	Tikthi	82.0694	23.0844	3.07
327	Chattisgarh	Dhamtari	Aouri	81.6870	20.8570	6.48
328	Chattisgarh	Dhamtari	Dorgardula	81.9111	20.4056	5.99
329	Chattisgarh	Dhamtari	Dugli	81.8708	20.4917	5.04
330	Chattisgarh	Dhamtari	Farsiya	82.0353	20.3221	6.49
331	Chattisgarh	Dhamtari	Jabarra	81.9858	20.4956	5.04
332	Chattisgarh	Dhamtari	Keregaon	81.7375	20.5486	18.67
333	Chattisgarh	Dhamtari	Khadadaha	81.6933	20.5733	38.60
334	Chattisgarh	Dhamtari	Kondapar	81.7250	21.0042	1.60
335	Chattisgarh	Dhamtari	Kouhabahara	81.8575	20.4916	5.11
336	Chattisgarh	Dhamtari	Shankarda	81.4492	20.6220	17.75
337	Chattisgarh	Durg	Jagtara	81.4425	20.6222	1.30
338	Chattisgarh	Gariyabandh	Amethi	82.0499	20.9361	1.07
339	Chattisgarh	Gariyabandh	Kaseru	82.1233	20.6486	4.70
340	Chattisgarh	Gariyabandh	Kharkhara	82.2033	20.7558	18.30
341	Chattisgarh	Gariyabandh	Malgaon	81.9807	20.6623	1.24
342	Chattisgarh	Gariyabandh	Sarkada	82.0594	20.9143	2.91
343	Chattisgarh	Janjgir-Champa	Saliabhata	82.8477	22.1368	1.14
344	Chattisgarh	Janjgir-Champa	vyasnagar	82.4509	21.8717	1.28
345	Chattisgarh	Kawardha	BijaBairangi	81.1659	21.7419	1.82
346	Chattisgarh	Kondagaon	Kulhadhgaon	81.6610	19.7817	1.67
347	Chattisgarh	Korba	Barpali	82.7733	22.2000	6.93
348	Chattisgarh	Korba	Bhaisma(Anjoripali)	82.7668	22.2775	1.61
349	Chattisgarh	Korba	Dhaurabhata	82.2334	22.1831	1.57
350	Chattisgarh	Korba	Jilga	83.0843	22.3713	7.51
351	Chattisgarh	Korba	Jogipali	83.0010	22.2057	2.01
352	Chattisgarh	Korba	kurtha (new)	82.5397	22.9283	8.84
353	Chattisgarh	Korba	Nanbirra	82.8656	22.2708	1.25

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
354	Chattisgarh	Korba	Nunera	82.4300	22.3561	2.46
355	Chattisgarh	Korba	Sargundia	82.7300	22.2269	1.68
356	Chattisgarh	Korba	Barpali(Junadhi)	82.7259	22.2063	1.95
357	Chattisgarh	Korba	Basin	83.0448	22.4294	10.36
358	Chattisgarh	Korba	Gajra	82.6185	22.4050	1.89
359	Chattisgarh	Korba	Kolga	82.9927	22.3967	7.43
360	Chattisgarh	Korba	Kudmura	83.0793	22.3191	8.16
361	Chattisgarh	Korba	Lakhanpur	82.5327	22.4573	2.17
362	Chattisgarh	Korba	Mudiyandar	82.5905	22.3142	1.98
363	Chattisgarh	Korba	Shuklakhar	82.5842	22.4220	2.17
364	Chattisgarh	Koriya	Banjaridand	82.4497	23.2911	8.15
365	Chattisgarh	Koriya	Ghugra	82.5237	23.3012	12.60
366	Chattisgarh	Koriya	kailashpur	82.4765	23.1161	1.88
367	Chattisgarh	Koriya	Khatgori	82.5264	23.4103	12.86
368	Chattisgarh	Koriya	Sonhat	82.5189	23.3139	58.67
369	Chattisgarh	Mahasamund	Bagbahara	82.4083	21.0333	7.41
370	Chattisgarh	Mahasamund	Lavra Khurud	82.1169	21.0886	1.90
371	Chattisgarh	Mahasamund	Maulimuda	82.4311	21.0055	6.75
372	Chattisgarh	Mahasamund	Palsipani	82.3833	20.9042	6.43
373	Chattisgarh	Mungeli	Bindabal	81.7950	22.4267	6.87
374	Chattisgarh	Mungeli	Patera	81.9317	22.3094	1.20
375	Chattisgarh	Mungeli	Tilaidabra	81.7950	22.4961	6.58
376	Chattisgarh	Raipur	Ghivara	81.9752	21.3691	1.60
377	Chattisgarh	Rajnandgaon	Chikohola	80.7428	21.0678	1.10
378	Chattisgarh	Rajnandgaon	Dhara	80.8594	21.2550	3.30
379	Chattisgarh	Rajnandgaon	Narmada	81.0724	21.6216	2.46
380	Chattisgarh	Rajnandgaon	Rangkathera	81.1125	21.3672	4.35
381	Chattisgarh	Rajnandgaon	Talagaon	80.8199	21.3019	2.55
382	Chattisgarh	Ranandgaon	Pailimeta	80.9869	21.6716	1.76
383	Chattisgarh	Surajpur	Dalabahara(Bhaskar)	82.6862	23.4071	11.47
384	Chattisgarh	Surajpur	Fulkona	82.6672	23.0806	4.57
385	Chattisgarh	Surajpur	Gonda	83.0583	23.0629	1.49
386	Chattisgarh	Surajpur	Narayanpur	82.6353	23.3957	1.38
387	Chattisgarh	Surajpur	Ramanuj nagar	82.7250	23.6478	5.66
388	Chattisgarh	Surajpur	Samouli(Bhayathan)	82.7652	22.8815	2.49
389	Chattisgarh	Surguja	Nagdand	83.2917	22.9522	19.99
390	Chattisgarh	Surguja	Parsa	83.2675	22.7333	7.45
391	Chattisgarh	Surguja	Pratapgarh	83.4764	23.1649	2.91
392	Delhi	Delhi	Rani Khera DW	77.0250	28.7069	1.12
393	Gujarat	Bharuch	Navetha	72.8306	21.7078	1.41
394	Gujarat	Narmada	Nani Singlot	73.6667	21.6694	1.65
395	Gujarat	Navsari	Onjal	72.8417	20.8333	2.53
396	Gujarat	Valsad	Kanadu	72.8417	20.3250	1.07
397	Gujarat	Valsad	Karwad	72.9750	20.3625	1.04
398	Haryana	Ambala	Dhanaura	77.1167	30.2958	1.19
399	Haryana	Bhiwani	Bamla	76.2453	28.8066	3.98
400	Haryana	Bhiwani	Bijna	76.1422	28.4636	4.72
401	Haryana	Bhiwani	Manhairu	76.2167	28.7028	5.37
402	Haryana	Bhiwani	Sui	76.0667	28.8569	2.58
403	Haryana	Faridabad	Sikri	77.2881	28.2781	2.44
404	Haryana	Hissar	Kuleri	75.6603	29.3606	2.84
405	Haryana	Hissar	Sohu	75.8333	29.4986	1.80
406	Haryana	Jhajjar	Chamanpura	76.6333	28.6958	1.26
407	Haryana	Palwal	Badoli	77.4331	28.0694	1.03
408	Haryana	Panipat	Karhansh	77.0100	29.2558	1.16

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
409	Haryana	Panipat	puthar	76.8720	29.2230	3.35
410	Haryana	Panipat	Sanauli	77.0911	29.3819	3.64
411	Haryana	Rohtak	Madina	76.4333	28.9383	2.02
412	Haryana	Sirsa	Karamsana	74.6300	29.3403	2.11
413	Haryana	Sonipat	Barauli	77.0294	29.0194	3.10
414	Haryana	Sonipat	Farmana	76.8125	28.9847	1.30
415	Haryana	Sonipat	Jakhauli	77.1490	28.9310	8.76
416	Haryana	Sonipat	Manauli	77.1806	28.9083	2.58
417	Haryana	Yamuna Nagar	Choli	77.3417	30.2792	6.55
418	Haryana	Yamuna Nagar	Dhaurang	77.1917	30.0667	1.04
419	Haryana	Yamuna Nagar	Naggal	77.2808	30.0694	7.14
420	Himachal Pradesh	Hamirpur	Bijhri	76.5393	31.5227	2.32
421	Himachal Pradesh	Kangra	Hardogri	76.2956	31.7839	5.08
422	Himachal Pradesh	Kangra	Pandtehr	76.6460	32.0375	2.97
423	Himachal Pradesh	Mandi	Gutkar	76.9500	31.6600	4.15
424	Himachal Pradesh	Sirmour	Sainwala I	77.2524	30.5385	6.06
425	Himachal Pradesh	Una	Rajli Panjal	76.4052	31.5362	1.98
426	Jammu	JAMMU	Chowki Choura	74.6500	33.0306	3.28
427	Jammu	JAMMU	Makwal	74.7169	32.6933	2.84
428	Jammu	JAMMU	Sajwal	74.5928	32.7922	2.17
429	Jammu	KATHUA	Nagri	75.4333	32.3500	2.28
430	Jammu	RAJOURI	Dharamsal	74.7417	32.8281	1.27
431	Jammu	RAJOURI	Pukharni	74.1131	33.2703	1.86
432	Jammu	REASI	Bhamla	74.5806	33.0500	1.04
433	Jammu	SAMBA	Upperla Kanhal	74.8833	32.6333	3.81
434	Jammu	Udhampur	Dalsar	75.3125	32.8189	5.03
435	Jharkhand	Barwadih	Barwadih	84.1167	23.8583	33.25
436	Jharkhand	Bokaro	Bermo/ Phusro	85.5800	23.4500	13.74
437	Jharkhand	Bokaro	Chandrapura	85.5000	23.4700	3.82
438	Jharkhand	Bokaro	Jaina More	86.1000	23.3200	1.25
439	Jharkhand	Bokaro	Pindrajora	86.1200	23.4200	1.39
440	Jharkhand	Chatra	Chatra	84.5200	24.1200	1.37
441	Jharkhand	Chatra	Itkhor	85.0600	24.1600	5.28
442	Jharkhand	Chatra	Simaria	84.5600	24.0200	6.08
443	Jharkhand	Deoghar	Sarath	86.5100	24.1400	10.85
444	Jharkhand	Dhanbad	Baghmara	86.2800	23.4800	3.64
445	Jharkhand	Dhanbad	Dhanbad New	86.2900	23.4700	12.40
446	Jharkhand	Dhanbad	Rajganj	86.2800	23.4700	2.47
447	Jharkhand	Dumka	Masalia	87.1100	24.0900	1.70
448	Jharkhand	Dumka	Shikaripara	87.2800	24.1400	5.50
449	Jharkhand	E. Singhbhum	Andharia	86.3800	22.2800	26.61
450	Jharkhand	E. Singhbhum	Baharagora	86.4300	22.1700	4.05
451	Jharkhand	E. Singhbhum	Kalapathar	86.4300	22.2800	4.60
452	Jharkhand	E. Singhbhum	Mosabani	86.2800	22.3100	2.21
453	Jharkhand	E. Singhbhum	Potka	86.1400	22.3700	1.37
454	Jharkhand	Giridih	Bagodar	86.0700	24.1800	1.62
455	Jharkhand	Giridih	Bandhutanr	86.2100	24.1700	7.06
456	Jharkhand	Giridih	Khijri	86.2400	24.1200	1.11
457	Jharkhand	Giridih	Tistri	85.0500	23.5100	9.12
458	Jharkhand	Godda	Sunder Pahari	87.2200	24.4500	16.56

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
459	Jharkhand	Gumla	Anjan gram	84.5100	23.0600	4.43
460	Jharkhand	Gumla	Nagfeni	84.7000	23.3000	1.45
461	Jharkhand	Gumla	Palkot	84.6400	22.8700	6.84
462	Jharkhand	Hazaribagh	Barkagaon	85.1200	23.5100	1.21
463	Jharkhand	Hazaribagh	Hazaribagh	85.2200	23.5700	1.02
464	Jharkhand	Hazaribagh	Hazaribagh	85.2700	24.0000	4.09
465	Jharkhand	Hazaribagh	Hazaribagh sadar	85.2200	23.5900	1.62
466	Jharkhand	Hazaribagh	Hazaribagh sadar	85.2200	23.5800	1.18
467	Jharkhand	Hazaribagh	Hazaribagh sadar	85.2300	23.5800	2.18
468	Jharkhand	Jamtara	Dhootala	86.3700	24.0200	1.21
469	Jharkhand	Jamtara	Kundahit	87.1000	23.5500	1.23
470	Jharkhand	Jamtara	Narayanpur	86.4200	24.0300	3.57
471	Jharkhand	Khunti	JaraToli	85.1900	23.0900	1.53
472	Jharkhand	Khunti	Sirka	85.2100	23.1100	1.27
473	Jharkhand	Koderma	Koderma	85.3100	24.2500	4.80
474	Jharkhand	Koderma	Tilaya	85.5168	24.4169	1.79
475	Jharkhand	Latehar	Balumath	84.4700	23.5000	1.96
476	Jharkhand	Latehar	Garu	84.1400	23.4100	15.16
477	Jharkhand	Latehar	Latehar	84.2400	23.4400	1.03
478	Jharkhand	Latehar	Mahuadanr	84.0500	23.2300	1.89
479	Jharkhand	Lohardaga	Bhandra	84.7700	23.3500	8.57
480	Jharkhand	Pakur	Maheshpur	87.4700	24.2600	1.38
481	Jharkhand	Palamu	Husainabad	83.5200	24.2500	1.78
482	Jharkhand	Palamu	Patan	84.1600	24.1000	1.13
483	Jharkhand	Ramgarh	Gola	85.2900	23.3800	22.99
484	Jharkhand	Ramgarh	Kuju	85.2800	23.4800	2.93
485	Jharkhand	Ramgarh	Mandu	85.2900	23..36	20.43
486	Jharkhand	Ranchi	Bishakhatanga	85.0100	23.2300	2.39
487	Jharkhand	Ranchi	Itki	85.0600	23.2000	4.88
488	Jharkhand	Ranchi	Namkom Bz Chowk	85.2100	23.1600	19.30
489	Jharkhand	Ranchi	Taimara	85.3000	23.1100	13.19
490	Jharkhand	Ranchi	Tamar	85.6333	23.0667	1.37
491	Jharkhand	Sahibganj	Borio	87.3500	25.0200	3.24
492	Jharkhand	Sahibganj	Sahebganj	87.3800	25.1400	1.36
493	Jharkhand	Simdega	Bano	84.9200	22.6600	1.45
494	Jharkhand	Simdega	Biru	84.7300	22.5500	2.35
495	Jharkhand	Simdega	Jaldega	84.8100	22.5700	5.28
496	Jharkhand	Simdega	ThethaiTangar	84.5100	22.5100	1.90
497	Jharkhand	W Singhbhum	Bandgaon	85.4500	22.3000	2.88
498	Jharkhand	W Singhbhum	CKP (Ulidihi)	85.3900	22.4000	1.49
499	Jharkhand	W Singhbhum	Jagannathpur	85.3800	22.1300	2.84
500	Jharkhand	W Singhbhum	Toretopa Noamundi	85.3000	22.0900	2.52
501	Karnataka	Chikkamagalur	Holekoppa	75.2306	13.4608	2.90
502	Karnataka	Dakshin Kannada	Shirtadi	75.0828	13.0908	1.69
503	Karnataka	Hassan	Hennali	75.8333	12.8311	1.17
504	Karnataka	Hassan	Kenchammana Hoskote	75.8508	12.8583	2.39
505	Karnataka	Kolar	Keilolli	78.2839	13.1200	9.21
506	Karnataka	Koppal	Bandi	76.0583	15.7333	1.02
507	Karnataka	Koppal	Koppal1	76.1500	15.3500	1.18
508	Karnataka	Koppal	Kuknoor	75.9839	15.4908	1.28
509	Karnataka	Raichur	Bagalwad	76.8842	16.2681	1.29
510	Karnataka	Raichur	Bomanhal	76.3344	16.0722	1.20
511	Karnataka	Raichur	Chikbergi	76.5006	15.7583	1.91
512	Karnataka	Raichur	Chikksarur	76.6336	16.1108	1.65
513	Karnataka	Raichur	Chincherki	76.7836	16.2011	1.54

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
514	Karnataka	Raichur	Galaga	76.8339	16.2672	1.57
515	Karnataka	Raichur	Kakargal	77.0667	16.3500	2.21
516	Karnataka	Raichur	Lingasugur A	76.5167	16.1167	1.12
517	Karnataka	Raichur	Maski A	77.2669	16.2708	1.08
518	Karnataka	Raichur	Mustoor	77.0167	16.3125	2.83
519	Karnataka	Raichur	Sindhur	76.7511	15.3106	1.43
520	Karnataka	Raichur	Watgal	76.7506	16.1047	1.30
521	Karnataka	Shimoga	Heddaripura	75.2669	13.9361	3.42
522	Karnataka	Shimoga	Hulkod	75.2500	13.5956	4.14
523	Karnataka	Shimoga	Kavurehakkalu	75.1139	13.5389	2.47
524	Karnataka	Shimoga	Malur (shimoga)	75.3342	13.7306	1.51
525	Karnataka	Shimoga	Mytheri	75.1847	13.6347	1.85
526	Karnataka	Tumkur	Madhugiri	77.2000	13.6667	1.13
527	Karnataka	Udupi	Bajegoli	75.0678	13.1986	3.07
528	Karnataka	Udupi	Idooru Kunjadi	74.7681	13.7544	28.73
529	Karnataka	Udupi	Maravanthe	74.6344	13.7250	2.82
530	Karnataka	Udupi	Miyar	75.0339	13.1956	1.62
531	Karnataka	Udupi	Sabrikatta	74.7675	13.5122	1.39
532	Karnataka	Udupi	Shankarnarayana	74.8511	13.6042	1.08
533	Karnataka	Uttara Kannada	Alakod	74.4844	14.3167	2.45
534	Karnataka	Uttara Kannada	Anshi	74.3833	14.9875	1.79
535	Karnataka	Uttara Kannada	Arekoppa	74.8792	14.5958	2.18
536	Karnataka	Uttara Kannada	Belekari	74.2667	14.7250	1.45
537	Karnataka	Uttara Kannada	Chandavar	74.4678	14.4000	8.16
538	Karnataka	Uttara Kannada	Haldipur	74.4175	14.3542	1.14
539	Karnataka	Uttara Kannada	Hemateman	74.8583	14.2292	1.81
540	Karnataka	Uttara Kannada	Honakona	74.1842	14.8911	2.66
541	Karnataka	Uttara Kannada	Kannegeri	74.7350	15.0572	4.99
542	Karnataka	Uttara Kannada	Kursi	74.6861	14.5403	1.15
543	Karnataka	Uttara Kannada	Tyagli	74.8744	14.4828	6.64
544	Karnataka	Uttara Kannada	Unchalli	74.9061	14.5781	1.22
545	Karnataka	Uttara Kannada	Vandatte	74.7250	14.3667	1.52
546	Kerala	Alappuzha	Pallana Market-Kwa	76.3880	9.3021	1.11
547	Kerala	Alappuzha	Ramanchira	76.5812	9.1312	1.78
548	Kerala	Alappuzha	Thakazhy	76.4246	9.3818	1.23
549	Kerala	Alappuzha	Thakazhy St.Rita'S Convent Govt. Up School	76.4233	9.3748	1.29
550	Kerala	Alappuzha	Thrikkunnappuzha Pathiyankara Kwa	76.4156	9.2409	2.59
551	Kerala	Alappuzha	Vazhuthanam-Kwa	76.4790	9.3040	3.41
552	Kerala	Alappuzha	Vellakkinar-Kwa	76.3305	9.4920	1.39
553	Kerala	Alapuzha	Valavanad	76.3300	9.6000	1.51
554	Kerala	Ernakulam	Aluva(Cherupushpam)	76.3592	10.0966	1.59
555	Kerala	Ernakulam	Angamali	76.3870	10.1961	2.88
556	Kerala	Idukki	Kuttikkanam1	76.9704	9.5801	10.19
557	Kerala	Kasarakode	Bandadka	75.2695	12.4997	2.70
558	Kerala	Kasarakode	kotayadi junction	75.2400	12.5700	11.73
559	Kerala	Kollam	Kottankulangara Bore	76.5373	8.9794	7.11
560	Kerala	Kollam	Pozhikara	76.6569	8.8119	9.59
561	Kerala	Kollam	Vallikavu	76.4958	9.0903	1.01
562	Kerala	Kozhikode	Kayapanachi	75.5910	11.7121	2.73
563	Kerala	Malappuram	Edakkara	76.3112	11.3589	1.60
564	Kerala	Malappuram	Edakulam	75.9861	10.8802	1.08

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
565	Kerala	Malappuram	Kariavattam	76.2498	11.0209	4.51
566	Kerala	Malappuram	Kottakkal	76.0121	10.9793	15.49
567	Kerala	Malappuram	Munderi	76.2404	11.4443	1.46
568	Kerala	Malappuram	Valancherry Exploratory well	76.0757	10.8959	1.00
569	Kerala	Thrissur	Ayyanthole BW	76.1876	10.5215	1.30
570	Kerala	Thrissur	Chelakkara	76.3345	10.6948	1.33
571	Kerala	Thrissur	Cheruthuruthy	76.2754	10.7509	2.13
572	Kerala	Thrissur	Muriyad	76.2635	10.3608	31.88
573	Kerala	Thrissur	Thekkumkara(Konat hukunnu)	76.2135	10.2836	6.74
574	Kerala	Thrissur	Thrissur	76.2177	10.5302	10.50
575	Kerala	Thrissur	Vilangannur BW	76.3527	10.5240	1.27
576	Kerala	Trivandrum	Anjengo	76.7600	8.6700	3.11
577	Madhya Pradesh	Alirajpur	Borkua	79.9590	24.7500	1.87
578	Madhya Pradesh	Alirajpur	Kathiwara	81.1900	23.3490	8.52
579	Madhya Pradesh	Anuppur	Jhriyatola	82.1040	23.2140	3.10
580	Madhya Pradesh	Anuppur	Lapta	81.8390	23.0310	1.03
581	Madhya Pradesh	Balaghat	Damoh2	80.1840	21.8130	1.44
582	Madhya Pradesh	Balaghat	Saleteka New	79.5230	21.9340	3.13
583	Madhya Pradesh	Betul	Ghatpiparia	80.4080	21.5510	1.14
584	Madhya Pradesh	Betul	Khedi	81.5460	23.6670	1.11
585	Madhya Pradesh	Bhind	Ater	77.3990	23.4100	3.69
586	Madhya Pradesh	Bhopal	Bairagarh	75.3830	23.7220	1.12
587	Madhya Pradesh	Bhopal	Nipaniya Jaat	81.4620	23.2610	9.40
588	Madhya Pradesh	Burhanpur	Shekhpura	81.5870	23.2710	2.02
589	Madhya Pradesh	Chhatarpur	Amodha	78.1140	23.6670	2.59
590	Madhya Pradesh	Chhatarpur	Buxwaha	79.8120	21.9610	1.05
591	Madhya Pradesh	Chhatarpur	Tatampur	79.7860	21.6360	1.18
592	Madhya Pradesh	Chhindwara	Delakhari	80.4990	23.8220	1.75
593	Madhya Pradesh	Chhindwara	Renikhera	80.6830	23.4090	1.65
594	Madhya Pradesh	Damoh	Nohta	81.8230	23.1830	10.58
595	Madhya Pradesh	Gwalior	Masoorpur New	78.8390	24.9200	1.19
596	Madhya Pradesh	Hoshangabad	Sanwalkhera	75.4900	24.0500	1.42
597	Madhya Pradesh	Jabalpur	Gokalpur	79.2270	24.2950	4.87
598	Madhya Pradesh	Katni	Ubra	81.4690	23.6980	3.58
599	Madhya Pradesh	Khandwa	Balwara1	82.1710	24.4470	8.38
600	Madhya Pradesh	Khandwa	Pandhana	81.7550	24.3960	3.45
601	Madhya Pradesh	Mandla	Ghughri	78.5610	23.7980	1.32
602	Madhya Pradesh	Mandla	Nainpur	80.2170	22.1530	4.00
603	Madhya Pradesh	Mandla	Pathiri Patpara	77.5810	23.2540	1.40
604	Madhya Pradesh	Morena	Aurethi	80.5510	22.1040	1.07
605	Madhya Pradesh	Morena	Morena	81.3780	24.4720	6.73
606	Madhya Pradesh	Neemuch	Morban1	77.2560	23.7940	3.89
607	Madhya Pradesh	Panna	Bahera	80.4880	21.4710	1.65
608	Madhya Pradesh	Panna	Tara	80.4900	21.9690	5.59
609	Madhya Pradesh	Rewa	Amilki	80.3460	24.6240	2.38
610	Madhya Pradesh	Rewa	Bara	80.3150	23.9790	1.09
611	Madhya Pradesh	Sagar	Dalpatpur	80.6180	21.5150	1.22
612	Madhya Pradesh	Satna	Birsinghpur	79.9990	22.3060	3.34
613	Madhya Pradesh	Satna	Mukundpur	80.0060	25.1390	1.72
614	Madhya Pradesh	Seoni	Dharamkuan	79.7620	21.8750	1.49
615	Madhya Pradesh	Seoni	Piparia1	79.8150	23.9260	1.85
616	Madhya Pradesh	Shahdol	Girwah	78.9960	23.6620	3.35
617	Madhya Pradesh	Sheopur	Kalmi	78.7980	24.6980	1.51
618	Madhya Pradesh	Sheopur	Piprani New	80.5470	24.3920	3.09

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
619	Madhya Pradesh	Shivpuri	Achhroni New	77.7650	23.5680	3.58
620	Madhya Pradesh	Shivpuri	Chorpura	80.8710	22.2360	8.31
621	Madhya Pradesh	Sidhi	Barambaba	80.6720	22.1540	1.95
622	Madhya Pradesh	Sidhi	Chilheri Kalan	80.6600	21.6240	2.09
623	Madhya Pradesh	Sidhi	Chourhat	79.9520	23.9040	1.15
624	Madhya Pradesh	Sidhi	Majhgawan	81.8190	24.1010	5.47
625	Madhya Pradesh	Tikamgarh	Kundeshwar	80.6220	23.8270	1.27
626	Madhya Pradesh	Ujjain	Delchi Buzurg	81.8730	22.9230	1.01
627	Madhya Pradesh	Ujjain	Khakri Sultan	82.2560	24.0470	1.30
628	Madhya Pradesh	Vidisha	Bagri	81.6080	22.9330	6.36
629	Madhya Pradesh	Vidisha	Nateran	77.6510	22.9170	1.06
630	Madhya Pradesh	Vidisha	Rasulli	78.8140	23.7160	1.43
631	Maharashtra	Ahmednagar	Shirasgaon	75.1125	19.5500	1.59
632	Maharashtra	Beed	Tintarvani-1	75.5078	19.1750	1.03
633	Maharashtra	Buldhana	Ambe Takli	76.6725	20.5183	1.92
634	Maharashtra	Buldhana	Datala-1	76.2028	20.8164	3.14
635	Maharashtra	Buldhana	Dighi	76.3367	20.8625	2.16
636	Maharashtra	Buldhana	Motala	76.2000	20.6833	1.29
637	Maharashtra	Chandrapur	Meha Bk	79.8850	20.2214	1.56
638	Maharashtra	Chandrapur	Pombhurna	79.6322	19.8722	14.60
639	Maharashtra	Chandrapur	Tumdi Menda	79.8014	20.6025	1.75
640	Maharashtra	Dhule	Ichhapur	74.4444	20.9722	1.41
641	Maharashtra	Dhule	Palasner	75.0472	21.5250	1.19
642	Maharashtra	Gadchiroli	Wadsa	79.9667	20.6167	1.65
643	Maharashtra	Latur	Latur Shani mandir	76.5764	18.4072	1.17
644	Maharashtra	Nanded	Hadgaon-1	77.6667	19.5000	1.92
645	Maharashtra	Nandurbar	Khuntamodi	74.0972	21.8056	1.60
646	Maharashtra	Nasik	Nalegaon	73.7000	20.1767	1.04
647	Maharashtra	Pune	Wagholi-1	74.0086	18.5992	1.84
648	Maharashtra	Ratnagiri	Mandargarh	73.2333	17.9667	1.98
649	Maharashtra	Ratnagiri	Oni	73.5833	17.7000	9.13
650	Maharashtra	Sindudurg	Achra	73.4667	16.2333	2.08
651	Maharashtra	Sindudurg	Adali (Dewalwadi)	73.9333	15.7750	11.08
652	Maharashtra	Sindudurg	Hadi (Gaonkarwadi)	73.4706	16.1375	2.87
653	Maharashtra	Solapur	Kandar	75.2000	18.1333	1.10
654	Maharashtra	Solapur	Madha	75.5164	18.0383	1.28
655	Maharashtra	Solapur	Marwade	75.5139	17.4306	1.93
656	Maharashtra	Solapur	Shelgaon	75.8333	17.9667	2.06
657	Maharashtra	Solapur	Soregaon	75.8833	17.5917	1.07
658	Maharashtra	Wardha	Mahakali	78.4608	20.9542	1.24
659	Maharashtra	Wardha	Wadhona-1	78.3453	20.9964	1.33
660	Maharashtra	Wasim	Chikli	76.8917	20.0083	1.50
661	Maharashtra	Wasim	Dapura	77.5206	20.3664	1.71
662	Maharashtra	Wasim	Deothana	77.1317	19.9694	1.56
663	Maharashtra	Wasim	Medshi	76.9417	20.3333	1.00
664	Maharashtra	Wasim	Nagalwadi	77.6192	20.6469	1.17
665	Maharashtra	Wasim	Punad Budruk	77.6439	20.5539	1.85
666	Maharashtra	Wasim	Wada	77.3333	20.3667	4.13
667	Maharashtra	Wasim	Washim	77.1417	20.1167	1.24
668	Odisha	Balasore	Baliapal	87.2854	21.6587	6.96
669	Odisha	Balasore	Bhalukasuni 1	86.7000	21.4917	3.64
670	Odisha	Balasore	Darkholi	86.5944	21.4986	1.13
671	Odisha	Baragarh	RESHAM	83.6974	21.1434	1.97
672	Odisha	Baragarh	Satlama	83.6181	21.1431	1.46
673	Odisha	Bhadrak	Basudevpur-I	86.6458	21.0575	2.42

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
674	Odisha	Bhadrak	Basudevpur-II	86.6458	21.0575	3.49
675	Odisha	Bhadrak	Betaligaon	86.5867	20.8650	3.24
676	Odisha	Bhadrak	Durgapur	86.5225	21.0297	2.13
677	Odisha	Bhadrak	Kenduapada	86.3711	21.0217	1.55
678	Odisha	Cuttack	C-03 Khannagar	85.8922	20.4442	1.51
679	Odisha	Cuttack	C-06 Bidanasi	85.8389	20.4908	1.91
680	Odisha	Cuttack	C-16 Bauxi Bazar	85.8758	20.4761	5.23
681	Odisha	Cuttack	C-31 Pithapur	85.7694	20.5767	1.54
682	Odisha	Cuttack	Gopalpur2	85.8847	20.4311	5.37
683	Odisha	Dhenkanal	Bhuban	85.8342	20.8844	5.38
684	Odisha	Dhenkanal	Kandarsingha	85.3167	20.8667	1.60
685	Odisha	Dhenkanal	Mahulpal	85.5406	20.8947	27.37
686	Odisha	Jagatsinghpur	Balia Store	86.0858	20.3278	1.85
687	Odisha	Jagatsinghpur	Bhutmundi1	86.5758	20.3239	4.34
688	Odisha	Jajpur	Arkhapur	86.1539	20.6539	2.25
689	Odisha	Jajpur	Kabatabandha	86.0250	20.8722	3.61
690	Odisha	Jajpur	Ragadiposi	86.0608	20.8003	1.53
691	Odisha	Jharsuguda	Chadnimal	84.3214	21.9375	12.57
692	Odisha	Jharsuguda	Ram Kumar Chawk	84.1069	21.8239	2.02
693	Odisha	Jharsuguda	Singarpur	83.9642	21.5956	1.49
694	Odisha	Jharsuguda	Sriyapali	84.0775	21.8347	1.68
695	Odisha	Kandhamal	Katringia	84.0894	20.4792	1.74
696	Odisha	Kendrapara	Jajanga	86.4419	20.5233	15.04
697	Odisha	Kendrapara	Pattamundai3	86.5647	20.5722	1.77
698	Odisha	Kendrapara	Rajnagar	86.7147	20.5731	1.23
699	Odisha	Kendrapara	Shyamsundarpur	86.3942	20.5056	2.14
700	Odisha	Keonjhar	Pitanali	85.4456	21.4133	1.86
701	Odisha	Khordha	B-14 Rasulgarh	85.8639	20.2953	2.38
702	Odisha	Khordha	B-22 Mancheswar	85.8900	20.3228	1.87
703	Odisha	Khordha	Kuhudi	85.3419	19.8794	15.49
704	Odisha	Koraput	Boriguma	82.5467	19.0514	2.40
705	Odisha	Koraput	Kenduguda	82.5444	18.9764	2.49
706	Odisha	Koraput	Khaliaguda	82.5458	19.1467	7.37
707	Odisha	Koraput	Mandalguda Colony	83.2139	19.1481	8.42
708	Odisha	Mayurbhanj	Bademtolia	86.2286	22.2353	2.06
709	Odisha	Mayurbhanj	Brundabanchandrapur	86.5917	21.6347	4.60
710	Odisha	Mayurbhanj	Hatjori	86.9083	21.6583	6.42
711	Odisha	Mayurbhanj	Jharpokhari	86.6486	22.1819	8.05
712	Odisha	Mayurbhanj	Poilaakunda	86.1306	22.4147	1.04
713	Odisha	Mayurbhanj	Similibandh	86.6500	21.6500	1.57
714	Odisha	Nabarangpur	Anchalguma1	82.6783	19.3236	2.71
715	Odisha	Nabarangpur	Kosagumunda	82.2428	19.2764	3.98
716	Odisha	Nabarangpur	Maidalpur1	82.5756	19.4672	1.52
717	Odisha	Nabarangpur	Nowrangpur 1	82.5489	19.2358	1.04
718	Odisha	Nabarangpur	Umarkot	82.2069	19.6639	2.45
719	Odisha	Nayagarh	Bhapur1	85.2939	20.2875	1.49
720	Odisha	Nayagarh	Kuluru Kumpa	84.6217	20.3967	1.72
721	Odisha	Puri	Baleshwarpatna	85.9114	19.8444	5.82
722	Odisha	Puri	Balighai	85.9425	19.8578	1.36
723	Odisha	Puri	Gop	86.0181	19.9819	1.02
724	Odisha	Puri	Mahapur	85.9644	19.9047	1.52
725	Odisha	Puri	Mangalpur	85.8292	20.0486	1.35
726	Odisha	Puri	P-42 Balighat	85.8483	19.8236	3.16
727	Odisha	Rayagada	Gorakhpur	83.1119	19.2408	8.00
728	Odisha	Sambalpur	Gargarbahal	84.1311	21.2847	1.22

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
729	Odisha	Sambalpur	Hirakud	83.8972	21.5306	1.00
730	Odisha	Sambalpur	Jugipali	83.9828	21.5272	2.36
731	Odisha	Sambalpur	Katar Kela	84.0331	21.4372	1.05
732	Odisha	Sambalpur	Kuchinda	84.3483	21.7425	3.21
733	Odisha	Sambalpur	Luhapank	84.4042	21.0700	4.04
734	Odisha	Sambalpur	Mochibahal	84.1639	21.1708	11.23
735	Odisha	Sambalpur	Simlipal Chawk	84.3658	21.3725	2.65
736	Odisha	Sambalpur	Talpali	84.0608	21.4311	4.26
737	Odisha	Sonepur	Chandajhuri	83.5611	21.0800	2.49
738	Odisha	Sonepur	Rampur	83.6906	21.1006	4.18
739	Odisha	Sundargarh	Bhasma	84.0375	21.9575	7.81
740	Odisha	Sundargarh	Ekma	84.3081	22.2886	10.39
741	Odisha	Sundargarh	Jagimal	83.9764	21.9894	3.36
742	Odisha	Sundargarh	Kuarmunda	84.7708	22.2833	3.20
743	Punjab	Gurdaspur	Gohlri	75.4736	31.8367	2.50
744	Punjab	Gurdaspur	Saleh chok	75.1833	32.0500	2.19
745	Punjab	Hoshiarpur	Chak Sheru	75.6244	32.0511	3.51
746	Punjab	Hoshiarpur	Pankhuh	75.6875	32.0208	11.52
747	Punjab	Hoshiarpur	Rampur Camp colony	75.9472	31.5028	3.49
748	Punjab	Hoshiarpur	Sibochak	75.7364	31.9869	6.21
749	Punjab	Nawanshahar	Behloor Kalan	76.1558	31.0183	1.37
750	Punjab	Patiala	Hari Majra	76.6067	30.3194	1.77
751	Punjab	Patiala	Kami Kalan	76.6792	30.3778	1.09
752	Punjab	Patiala	Miranpur	76.4944	30.2083	1.80
753	Punjab	Patiala	Thuha	76.5542	30.5000	1.10
754	Punjab	Ropar	Kakrali	76.5244	30.8342	2.28
755	Rajasthan	Ajmer	Masuda1	74.5125	26.0917	1.47
756	Rajasthan	Banswara	Kusalgarh	74.4500	23.2000	1.36
757	Rajasthan	Churu	Aspalsar	74.5000	28.5800	1.06
758	Rajasthan	Dhaulpur	Gajpura	77.6900	26.5800	2.57
759	Rajasthan	Dungaarpur	Aspur1	74.0792	23.9583	1.91
760	Rajasthan	Dungaarpur	Beechiwara	73.5000	23.7833	2.62
761	Rajasthan	Dungaarpur	Sagwara	74.0281	23.7500	2.47
762	Rajasthan	Dungarpur	Baroda	74.0700	23.9100	1.11
763	Rajasthan	Dungarpur	Bhilura	74.0800	23.6200	1.25
764	Rajasthan	Dungarpur	Nandor	73.9600	23.6800	3.81
765	Rajasthan	Dungarpur	Ratanpur	73.4500	23.7600	2.53
766	Rajasthan	Jaisalmer	Awai	71.8300	27.5200	1.73
767	Rajasthan	Jaisalmer	Luna Kalan	71.5700	26.6200	4.87
768	Rajasthan	Jaisalmer	Moolsagar	70.8350	26.9125	1.27
769	Rajasthan	Jhalawar	Binda	76.1900	24.4100	11.17
770	Rajasthan	Pratapgarh	Dholapani	74.6800	24.2700	1.05
771	Rajasthan	Pratapgarh	Khunta	74.4600	24.0300	1.48
772	Rajasthan	Rajsamand	Baghana	73.8400	25.5000	1.64
773	Rajasthan	Rajsamand	Nadiawala	73.8600	25.2000	1.79
774	Rajasthan	Tonk	Jainagar	75.8800	25.9300	1.77
775	Rajasthan	Udaipur	Dingri	73.8700	24.2200	2.50
776	Rajasthan	Udaipur	Garanwas	73.3500	24.1500	1.13
777	Rajasthan	Udaipur	Ghuri Mari	73.3900	24.3100	3.34
778	Rajasthan	Udaipur	Jaswantgarh	73.4683	24.8000	1.72
779	Rajasthan	Udaipur	Koliyari	73.3760	24.3330	9.97
780	Tamil Nadu	COIMBATORE	Thondamuthur	76.5041	10.5914	1.18
781	Tamil Nadu	Cuddalore	Abaddaranapuram DW	79.5533	11.5819	1.10
782	Tamil Nadu	Erode	Archalur	77.7000	11.1625	2.38

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
783	Tamil Nadu	Erode	Murlipudur	77.6560	11.6780	1.27
784	Tamil Nadu	Erode	Nathakadaiyur	77.6643	11.0874	1.99
785	Tamil Nadu	Erode	Punnachipudur	77.6661	11.5919	3.46
786	Tamil Nadu	Erode	Talavadi new	77.0231	11.7756	1.53
787	Tamil Nadu	Kancheepuram	Akkarai	80.2500	12.9000	1.65
788	Tamil Nadu	KANCHEEPURA M	Nedunkundram	80.6490	12.8847	2.71
789	Tamil Nadu	Krishnagiri	Kelamangalam pz	77.8625	12.5997	8.41
790	Tamil Nadu	Krishnagiri	Nagathunai	77.9128	12.5639	7.00
791	Tamil Nadu	Madurai	Kulamnagalm pz	78.1147	10.0139	2.50
792	Tamil Nadu	Nagapattinam	Odacherry	79.7233	10.5786	3.24
793	Tamil Nadu	Nagapattinam	Thalainayar	79.7733	10.5633	1.98
794	Tamil Nadu	Nagapattinam	Tirukadaiyur	79.8289	10.4781	3.30
795	Tamil Nadu	NILGIRI	Cherambadi	79.1637	11.3050	3.30
796	Tamil Nadu	Pudukkottai	Pudukkottai	78.8042	10.3861	1.67
797	Tamil Nadu	Thanjavur	Kuttalam	79.5575	11.0733	3.30
798	Tamil Nadu	Tiruvallur	Tirumazhisai	80.0600	13.0600	1.82
799	Tamil Nadu	Tiruvarur	Thillaiyillagam	79.5917	10.3708	1.69
800	Tamil Nadu	TUTICORIN	Ettaiyapuram	78.0000	9.1263	2.38
801	Tamil Nadu	Villupuram	Tirukkcoilur1	79.2167	11.9583	4.99
802	Telangana	Adilabad	Pembi	78.6422	19.1978	1.24
803	Telangana	Hyderabad	Boinpally-PZ	78.4792	17.4625	1.53
804	Telangana	Mahabubnagar	Alampur X Road-PZ	78.0186	15.9147	1.66
805	Telangana	Mahabubnagar	Alampur-Pz	78.1267	15.8794	5.63
806	Telangana	Mahabubnagar	Ayyavaripally-PZ	78.0328	16.1275	1.76
807	Telangana	Mahabubnagar	Beechpally-PZ	77.9283	16.1606	2.04
808	Telangana	Mahabubnagar	Chagapur-Pz	77.8344	16.0344	1.50
809	Telangana	Mahabubnagar	Gopalpet-Pz	78.1469	16.3931	1.85
810	Telangana	Mahabubnagar	Hanwada-DW14	77.9333	16.8028	1.59
811	Telangana	Mahabubnagar	Jadcharla 2012Pz	78.1450	16.7478	1.22
812	Telangana	Mahabubnagar	Jananpet-Pz	77.9894	16.6467	3.51
813	Telangana	Mahabubnagar	Jatpol-PZ	78.2069	16.0531	2.94
814	Telangana	Mahabubnagar	Jellapur-Pz	77.9731	15.9892	1.10
815	Telangana	Mahabubnagar	Jupally-PZ	78.6033	16.6594	1.43
816	Telangana	Mahabubnagar	Kandur-Pz	77.9600	16.5569	2.01
817	Telangana	Mahabubnagar	Kethepally-Pz	78.1594	16.1961	1.82
818	Telangana	Mahabubnagar	Kollapur-Pz	78.3075	16.1075	1.92
819	Telangana	Mahabubnagar	Lingal-PZ	78.5639	16.2956	3.26
820	Telangana	Mahabubnagar	Manganur-PZ	78.1553	16.5822	2.88
821	Telangana	Mahabubnagar	Mogiligidda 2012Pz	78.1175	17.0828	2.16
822	Telangana	Mahabubnagar	Narsaiahpally-Pz	78.2433	16.1814	7.31
823	Telangana	Mahabubnagar	Pangal-Pz	78.1183	16.2642	2.31
824	Telangana	Mahabubnagar	Pebbair-PZ	77.9983	16.1836	1.82
825	Telangana	Mahabubnagar	Pedda Dagada-PZ	78.1647	16.0503	2.34
826	Telangana	Mahabubnagar	Pedda Kothapally-PZ	78.3617	16.2956	1.16
827	Telangana	Mahabubnagar	Pedda Mudnur-PZ	78.3581	16.3900	1.05
828	Telangana	Mahabubnagar	Pedda Mulgera-PZ 1	78.0744	16.6586	1.08
829	Telangana	Mahabubnagar	PonnakelPz	77.9411	16.5667	1.66
830	Telangana	Mahabubnagar	Tadoor-PZ	78.3600	16.5158	1.21
831	Telangana	Mahabubnagar	Tarnikal-Pz	78.4517	16.6194	1.52
832	Telangana	Mahabubnagar	Telkapalli-PZ	78.5639	16.5781	1.20
833	Telangana	Mahabubnagar	Timmajipet 2012Pz	78.1928	16.6706	1.50
834	Telangana	Mahabubnagar	Vanaparathi-PZ	78.0697	16.3667	1.08
835	Telangana	Mahabubnagar	Vatem-PZ	78.2158	16.5914	1.03
836	Telangana	Mahabubnagar	Velgonda-PZ	78.1047	16.0847	1.79
837	Telangana	Medak	Chalki	77.9972	17.9972	1.58

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
838	Telangana	Medak	Digwal-PZ	77.7122	17.6636	9.15
839	Telangana	Medak	Kallakal	78.4667	17.7208	11.23
840	Telangana	Medak	Kohir	77.7208	17.6056	49.86
841	Telangana	Medak	Lingampalle-PZ	77.7583	17.6667	1.39
842	Telangana	Medak	Maanur	77.7361	17.9792	1.77
843	Telangana	Medak	Mannapur	77.5208	17.6306	1.19
844	Telangana	Nalgonda	Bodangiparti-Aq-II	79.0447	17.0447	1.19
845	Telangana	Nalgonda	Chinna Padshala-PZ14	79.3547	17.4678	1.17
846	Telangana	Nalgonda	Kandagatla-PZ2	79.6258	17.2675	1.37
847	Telangana	Nalgonda	Suryapet-PZ2	79.6067	17.1439	1.32
848	Telangana	Nizamabad	Bichkonda	77.7000	18.4000	8.82
849	Telangana	Nizamabad	Khazipur-2012pz	77.7919	18.5514	1.44
850	Telangana	Nizamabad	Mosra-PZ	77.9750	18.6139	6.58
851	Telangana	Ranga Reddy	Kulkachrla 2011Pz	77.8678	17.0125	7.06
852	Telangana	Ranga Reddy	Muchantal PZ	78.3306	17.1658	1.31
853	Telangana	Ranga Reddy	Sainikpuri-PZ	78.5500	17.4875	1.96
854	Telangana	Ranga Reddy	Salbatapur-DW13	78.1594	17.1203	1.27
855	Telangana	Warangal	Devaruppala-DW13	79.3517	17.5333	1.59
856	Telangana	Warangal	Projectnagar-3	80.1833	18.2333	1.24
857	Tripura	Dhalai	Kamalpur	91° 48' 54.7"	24° 10' 10.7"	3.58
858	Tripura	Gomti	Dhawajnagar	91° 27' 54.8"	23° 33' 13.5"	3.27
859	Tripura	South Tripura	Ananda Bandhu Para	91° 46.745"	23° 12.839"	1.37
860	Tripura	South Tripura	Paschim Jalefa EW	91.6869	23.0333	11.57
861	Tripura	South Tripura	Sabroom	91° 43' 25.7"	23° 00' 22.4"	1.67
862	Tripura	West Tripura	Tarapur	91°23'11.99 8	23°59'1.62 9	1.01
863	Uttar Pradesh	Allahabad	Bahadurapur	82.0106	25.4270	1.05
864	Uttar Pradesh	Allahabad	Baheria	81.9441	25.6963	3.84
865	Uttar Pradesh	Allahabad	Karchhana	81.9256	25.3122	2.38
866	Uttar Pradesh	Allahabad	Pratapapur	82.2163	25.5195	1.51
867	Uttar Pradesh	Allahabad	Saidabad	82.1242	25.4177	4.80
868	Uttar Pradesh	Allahabad	Shankargarh	81.5817	25.2234	3.76
869	Uttar Pradesh	Allahabad	Soraon	81.8714	25.6037	1.67
870	Uttar Pradesh	Ambedkar Nagar	Baskhari	82.7792	26.4852	3.47
871	Uttar Pradesh	Auraiya	Achaladah	79.4025	26.6994	1.99
872	Uttar Pradesh	Auraiya	Auraiya	79.5144	26.4636	6.93
873	Uttar Pradesh	Auraiya	Bidhuna	79.5028	26.8022	1.33
874	Uttar Pradesh	Azamgarh	koyalsa	83.0121	26.2025	3.32
875	Uttar Pradesh	Azamgarh	mohammadpur	83.0281	25.9621	1.06
876	Uttar Pradesh	Azamgarh	palhana	83.0859	25.7832	2.60
877	Uttar Pradesh	Azamgarh	palhani	83.1873	26.0514	2.57
878	Uttar Pradesh	BAHRAICH	BALHA	81.5222	27.8389	1.81
879	Uttar Pradesh	BAHRAICH	BISHESHWARGAN J	81.8325	27.3419	1.15
880	Uttar Pradesh	BAHRAICH	PAYAGPUR	81.6000	27.5833	2.26
881	Uttar Pradesh	BAHRAICH	RISIYA	81.6075	27.6892	4.36
882	Uttar Pradesh	BAHRAICH	SHIVPUR	81.5401	27.6840	1.97
883	Uttar Pradesh	BAHRAICH	TEJWAPUR	81.6245	27.5984	1.47
884	Uttar Pradesh	Ballia	Bairya	84.4734	25.7769	2.30
885	Uttar Pradesh	Ballia	belhari	84.2934	25.7363	2.38
886	Uttar Pradesh	Ballia	chilkahar	83.9643	25.8250	1.02

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
887	Uttar Pradesh	Ballia	dubahar	84.2393	27.4450	2.43
888	Uttar Pradesh	Ballia	garwar	84.0291	25.8288	1.73
889	Uttar Pradesh	Ballia	maniyar	84.1632	25.9826	1.97
890	Uttar Pradesh	Ballia	murali chhapara	84.5165	25.7282	1.61
891	Uttar Pradesh	Ballia	negara	83.8737	25.9710	1.02
892	Uttar Pradesh	Ballia	pandoh	84.0022	25.9573	3.34
893	Uttar Pradesh	Ballia	reoti	84.3718	25.8418	2.39
894	Uttar Pradesh	Ballia	sohaon	84.0040	25.6293	3.88
895	Uttar Pradesh	BALRAMPUR	GAIDAS BUZURG	82.5461	27.5446	1.26
896	Uttar Pradesh	BALRAMPUR	PACHPERVA	82.6306	27.5275	1.09
897	Uttar Pradesh	BALRAMPUR	REHRA BUZURG	82.4658	27.5432	2.88
898	Uttar Pradesh	BALRAMPUR	TULSIPUR	82.2956	27.5225	1.19
899	Uttar Pradesh	Banda	DADRAUL	79.8652	27.8999	1.45
900	Uttar Pradesh	Banda	JAITPUR	79.5529	27.9958	2.70
901	Uttar Pradesh	Banda	KALAN	79.4155	27.7150	3.11
902	Uttar Pradesh	Banda	KHUTAR	80.2462	28.1934	4.83
903	Uttar Pradesh	Banda	SINDHAULI	79.9832	27.9654	2.72
904	Uttar Pradesh	Barabanki	bani Kodar	80.8546	26.8245	2.62
905	Uttar Pradesh	Barabanki	banki	81.4238	26.8935	1.76
906	Uttar Pradesh	Barabanki	Fatehpur	81.2030	27.1836	1.95
907	Uttar Pradesh	Barabanki	Haidergarh	81.3054	27.1456	1.17
908	Uttar Pradesh	Barabanki	Masauli	81.2947	26.9871	1.53
909	Uttar Pradesh	Barabanki	Mawai	81.2648	26.9574	1.52
910	Uttar Pradesh	Barabanki	Nindura	81.5342	26.9245	1.20
911	Uttar Pradesh	Barabanki	Ramnagar	79.1226	26.3869	3.90
912	Uttar Pradesh	Barabanki	Rudauli	81.5423	26.8471	3.43
913	Uttar Pradesh	Barabanki	Siddhaur	81.3882	26.7691	1.88
914	Uttar Pradesh	Bareilly	ALAMPUR JAFARABAD	79.3336	28.2383	1.34
915	Uttar Pradesh	Bareilly	BHOJIPURA	79.4401	28.4977	2.38
916	Uttar Pradesh	Bareilly	BHUTAH	79.6317	28.3392	1.79
917	Uttar Pradesh	Bareilly	FARIDPUR	79.5323	28.2068	2.60
918	Uttar Pradesh	Bareilly	KIYARA	79.4381	28.2527	1.20
919	Uttar Pradesh	Bareilly	MEERGANJ	79.2107	28.5094	4.16
920	Uttar Pradesh	Bareilly	SHERGARH	79.3951	28.6544	1.37
921	Uttar Pradesh	BASTI	BAHADURPUR	82.6881	26.6886	3.03
922	Uttar Pradesh	BASTI	BASTI SADAR	82.7531	26.8003	1.20
923	Uttar Pradesh	BASTI	DUBAULIYA	82.4762	26.8125	3.02
924	Uttar Pradesh	BASTI	GAUR	82.4500	26.8214	1.50
925	Uttar Pradesh	BASTI	HARRAIYA	82.4647	26.8278	2.85
926	Uttar Pradesh	BASTI	KAPTANGANJ	82.5653	26.7622	1.15
927	Uttar Pradesh	BASTI	KUDRAHA	82.7994	26.6150	2.00
928	Uttar Pradesh	BASTI	PARASRAMPUR	82.3397	26.9050	1.52
929	Uttar Pradesh	BASTI	RUDAULI	82.8153	27.0278	1.20
930	Uttar Pradesh	BASTI	SAUNGHAT	82.6454	26.7904	2.35
931	Uttar Pradesh	BASTI	VIKRAMJOT	82.3658	26.7803	1.55
932	Uttar Pradesh	Bijnor	Afzal ghar	78.6914	29.3818	1.43
933	Uttar Pradesh	Bijnor	Kiratpur	78.2696	29.4966	1.21
934	Uttar Pradesh	Bijnor	Mohammadpur	78.1149	29.4744	1.33
935	Uttar Pradesh	Budaun	DAHIGAWAN	78.6665	28.1500	1.18
936	Uttar Pradesh	Budaun	DATAGANJ	79.4141	28.0265	3.66
937	Uttar Pradesh	Budaun	ISLAMNAGAR	78.7395	28.3505	2.64
938	Uttar Pradesh	Budaun	JUNAWAI	78.5245	28.1813	2.90
939	Uttar Pradesh	Budaun	RAJPURA	78.3845	28.3639	1.40
940	Uttar Pradesh	Bulandshahar	Anupshahar	78.8356	28.3611	6.44
941	Uttar Pradesh	Bulandshahar	Lakhaoti	77.9767	28.5258	2.50

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
942	Uttar Pradesh	Chandauli	Barahani	83.4274	25.3021	1.00
943	Uttar Pradesh	Chandauli	Naugarh	83.0908	27.2953	14.50
944	Uttar Pradesh	Deoria	Bankata	84.1136	26.2669	1.74
945	Uttar Pradesh	Deoria	Barhaj	83.7261	26.2678	3.76
946	Uttar Pradesh	Deoria	Rampur Karkhana	83.8150	26.5628	1.25
947	Uttar Pradesh	Deoria	Tarkulwa	83.8908	26.6278	1.74
948	Uttar Pradesh	Etawah	Jashwant Nagar	78.9119	26.8761	1.09
949	Uttar Pradesh	Faizabad	Mawana	82.4567	26.2458	2.33
950	Uttar Pradesh	Ghazipur	mardah	83.5597	25.8039	4.06
951	Uttar Pradesh	Ghazipur	reotipur	83.7034	25.5403	2.38
952	Uttar Pradesh	Ghazipur	sadat	83.3006	25.6973	1.71
953	Uttar Pradesh	Ghazipur	saidpur	83.2279	25.5417	2.06
954	Uttar Pradesh	GONDA	BELSAR	81.9100	26.9756	3.99
955	Uttar Pradesh	GONDA	COLONELGANJ	81.6956	27.1339	6.24
956	Uttar Pradesh	GONDA	HALDHARMAU	81.7611	27.1389	7.20
957	Uttar Pradesh	GONDA	JHANJHARI	81.9672	27.1189	6.17
958	Uttar Pradesh	GONDA	KATRA BAZAR	81.7936	27.2064	2.37
959	Uttar Pradesh	GONDA	NAWAB GANJ	82.1354	27.1944	2.18
960	Uttar Pradesh	GONDA	TARAB GANJ	82.9955	26.7800	2.40
961	Uttar Pradesh	Gorakhpur	Bansgaon	83.3528	26.5527	1.22
962	Uttar Pradesh	Gorakhpur	Barhalganj	83.5023	26.2836	2.11
963	Uttar Pradesh	Gorakhpur	Chargaon	83.3945	26.8021	1.79
964	Uttar Pradesh	Gorakhpur	Compierganj	83.2678	27.2015	5.14
965	Uttar Pradesh	Gorakhpur	Kauri Ram	83.4152	26.5161	1.64
966	Uttar Pradesh	Gorakhpur	Khajni	83.2490	26.6646	2.63
967	Uttar Pradesh	Gorakhpur	Pali	83.2039	26.8206	1.20
968	Uttar Pradesh	Gorakhpur	Sahjanwa	83.1856	26.7513	1.36
969	Uttar Pradesh	Hamirpur	Sarila	79.6747	25.7731	1.03
970	Uttar Pradesh	Hardoi	Behdar khurd	80.4070	26.9900	1.62
971	Uttar Pradesh	Hardoi	Bharkhani	79.7720	27.5540	2.41
972	Uttar Pradesh	Hardoi	Bilgram	79.9990	27.2250	3.11
973	Uttar Pradesh	Hardoi	Harpalpur	79.7960	27.3560	2.50
974	Uttar Pradesh	Hardoi	Kachhauna	80.3380	27.1670	4.34
975	Uttar Pradesh	Hardoi	Shahabad	79.9170	27.5940	1.76
976	Uttar Pradesh	Hardoi	Sursa	80.1130	27.2830	1.71
977	Uttar Pradesh	Hathras	Sadabad	78.0400	27.4469	2.73
978	Uttar Pradesh	Jalaun	MADHO GARH	79.1811	26.2389	1.17
979	Uttar Pradesh	Jaunpur	Badlapur	82.4994	25.9325	2.81
980	Uttar Pradesh	Jaunpur	Ram Nagar	82.7700	25.6242	2.92
981	Uttar Pradesh	Jaunpur	Shahganj	82.2875	25.7665	2.31
982	Uttar Pradesh	Jaunpur	Sujanganj	82.2875	25.7664	1.30
983	Uttar Pradesh	Jhansi	BANGRA	79.0055	25.3118	1.86
984	Uttar Pradesh	Jhansi	MAURANIPUR	79.1935	25.2365	2.96
985	Uttar Pradesh	Kannauj	Jalalabad	79.7864	27.1026	5.12
986	Uttar Pradesh	Kanpur Dehat	Rasoolabad	79.7839	26.6681	2.45
987	Uttar Pradesh	Kanpur Nagar	Chaubepur	80.2236	26.6211	8.04
988	Uttar Pradesh	Kanpur Nagar	Shivrajpur	80.1403	26.6853	2.08
989	Uttar Pradesh	Kasganj	AMANPUR	78.7393	27.7080	4.32
990	Uttar Pradesh	Kasganj	GANJ DUNDWARA	78.9330	27.7290	1.51
991	Uttar Pradesh	Kushinagar	Fazil Nagar	84.0464	26.6825	1.94
992	Uttar Pradesh	Kushinagar	Hata	83.8245	26.7700	2.15
993	Uttar Pradesh	Kushinagar	Kaptanganj	83.6470	26.9035	5.31
994	Uttar Pradesh	Kushinagar	Khadda	83.8811	27.1678	1.77
995	Uttar Pradesh	Kushinagar	Nebuwa Naurangia	83.8688	27.0542	2.20
996	Uttar Pradesh	Kushinagar	Padrauna	83.9806	26.8844	6.11

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
997	Uttar Pradesh	Kushinagar	Ram Kola	83.8314	26.9078	1.16
998	Uttar Pradesh	Kushinagar	Sukrauli	83.6553	26.7353	5.78
999	Uttar Pradesh	Lakhimpur Khiri	Behjam	80.6210	27.9350	1.80
1000	Uttar Pradesh	Lakhimpur Khiri	Dhaurahra	81.1000	27.9450	1.11
1001	Uttar Pradesh	Lakhimpur Khiri	Ishanagar	81.1800	27.8760	2.03
1002	Uttar Pradesh	Lakhimpur Khiri	Khiri	80.7370	27.9500	2.19
1003	Uttar Pradesh	Lakhimpur Khiri	Mitauli	80.4300	27.8680	1.50
1004	Uttar Pradesh	Lakhimpur Khiri	Mohammadi	80.2120	27.9540	2.77
1005	Uttar Pradesh	Lakhimpur Khiri	Nakaha	80.9120	27.9060	4.90
1006	Uttar Pradesh	Lakhimpur Khiri	Palia Kalan	80.6720	28.4160	5.92
1007	Uttar Pradesh	Lakhimpur Khiri	Phoolbeher	80.7430	28.0600	2.00
1008	Uttar Pradesh	Lakhimpur Khiri	Ramaiyabehar	81.0690	28.0860	1.99
1009	Uttar Pradesh	Lalitpur	BAR	78.5778	24.8729	1.39
1010	Uttar Pradesh	Lucknow	Bakshi ka Talaab	80.9083	26.9967	1.08
1011	Uttar Pradesh	Lucknow	Malihabad	80.7108	26.9250	1.89
1012	Uttar Pradesh	Maharajganj	Dhani	83.1943	27.0881	3.00
1013	Uttar Pradesh	Maharajganj	Ghughuli	83.6129	27.0715	1.46
1014	Uttar Pradesh	Maharajganj	Paniyara	83.4470	27.0116	2.33
1015	Uttar Pradesh	Maharajganj	Partawal	83.5559	26.9560	1.40
1016	Uttar Pradesh	Maharajganj	Siswa	83.7572	27.1431	4.64
1017	Uttar Pradesh	Mahoba	Jaitpur	79.5739	25.2794	8.87
1018	Uttar Pradesh	Mathura	Mathura	77.6747	27.5292	2.83
1019	Uttar Pradesh	Maunath bhanjan	Bhadraon	83.5111	26.1806	1.95
1020	Uttar Pradesh	Maunath bhanjan	dohari ghat	83.5094	26.2678	4.16
1021	Uttar Pradesh	Meerut	Machhra	77.8933	28.8953	4.48
1022	Uttar Pradesh	Meerut	Parichhatgarh	77.9208	28.9781	1.80
1023	Uttar Pradesh	Meerut	Rajpura	77.7697	29.0108	4.86
1024	Uttar Pradesh	Mirzapur	Kon	82.5376	25.1931	2.11
1025	Uttar Pradesh	Mirzapur	Marihan	82.7267	24.9051	20.17
1026	Uttar Pradesh	Mirzapur	Rajgarh	82.8284	24.9909	6.15
1027	Uttar Pradesh	Mirzapur	Sikhar	82.8356	25.1422	1.41
1028	Uttar Pradesh	Moradabad	Bahjoi	78.6285	28.3898	2.16
1029	Uttar Pradesh	Moradabad	Bhagatpur	78.8512	28.9580	1.95
1030	Uttar Pradesh	Moradabad	Bilari	78.8185	28.6098	2.41
1031	Uttar Pradesh	Moradabad	Deengarpur	78.7126	28.7007	1.66
1032	Uttar Pradesh	Moradabad	Moondhapanday	78.9102	28.8117	2.33
1033	Uttar Pradesh	Moradabad	Moradabad	78.7694	28.8451	1.98
1034	Uttar Pradesh	Muzaffarnagar	Budhanpur	77.6439	29.2886	2.06
1035	Uttar Pradesh	Muzaffarnagar	Jansath	77.5464	29.3125	2.14
1036	Uttar Pradesh	Muzaffarnagar	Muzaffarnagar	77.7000	29.4694	2.08
1037	Uttar Pradesh	Muzaffarnagar	Un	77.2464	29.5783	17.76
1038	Uttar Pradesh	Pilibhit	BISALPUR	79.8004	28.3022	1.61
1039	Uttar Pradesh	Pilibhit	LALAULI KHERA	79.8254	28.2945	5.04
1040	Uttar Pradesh	Pratapgarh	Aspur-Deosara	82.3164	25.9706	1.06
1041	Uttar Pradesh	Pratapgarh	Kalanker	81.3728	25.8272	5.19
1042	Uttar Pradesh	Pratapgarh	Kunda	81.5042	25.7008	1.37
1043	Uttar Pradesh	Pratapgarh	Mandhata	81.8692	25.8131	6.37
1044	Uttar Pradesh	Pratapgarh	Patti	82.1964	25.9158	1.95
1045	Uttar Pradesh	Rae Bareili	Chhatoh	81.3254	26.4586	2.30
1046	Uttar Pradesh	Rae Bareili	Jagatpur	81.1870	26.0326	1.76
1047	Uttar Pradesh	Rae Bareili	Sheogarh	81.3546	26.5412	2.04
1048	Uttar Pradesh	Rae Bareili	Singhpur	81.4245	26.2452	7.19
1049	Uttar Pradesh	Rae Bareili	Tiloi	81.3568	26.5321	7.13
1050	Uttar Pradesh	Rampur	Chamrarura	79.0281	28.8081	4.00
1051	Uttar Pradesh	Rampur	Milak	79.1797	28.6066	4.30

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1052	Uttar Pradesh	Rampur	Saidnagar	78.9885	28.8580	1.07
1053	Uttar Pradesh	Rampur	Swar	79.0557	29.0565	1.16
1054	Uttar Pradesh	Saharanpur	Gangoh	77.2600	29.7858	2.61
1055	Uttar Pradesh	Saharanpur	Nagal	77.6317	29.8417	5.90
1056	Uttar Pradesh	Saharanpur	Nanauta	77.4356	29.7133	4.34
1057	Uttar Pradesh	Saharanpur	Puwarka	77.5878	29.9892	1.97
1058	Uttar Pradesh	Saharanpur	Rampur	77.4533	29.8133	2.37
1059	Uttar Pradesh	Saharanpur	Sarsawa	77.3992	30.0117	4.00
1060	Uttar Pradesh	SHRAWASTI	HARIHARPUR RANI	81.9367	27.7069	2.09
1061	Uttar Pradesh	SHRAWASTI	IKAUNA	81.9675	27.5278	12.47
1062	Uttar Pradesh	SHRAWASTI	JAMUNAHA	81.7711	27.8211	3.95
1063	Uttar Pradesh	SHRAWASTI	SIRSIYA	82.0900	27.7983	1.17
1064	Uttar Pradesh	SIDDHARTH NAGAR	BARHANI	82.7672	27.3083	2.83
1065	Uttar Pradesh	SIDDHARTH NAGAR	ITWA	82.6931	27.3222	1.35
1066	Uttar Pradesh	SIDDHARTH NAGAR	KHESRAHA	82.9872	27.0733	4.14
1067	Uttar Pradesh	SIDDHARTH NAGAR	LOTAN	82.2345	27.1548	2.89
1068	Uttar Pradesh	SIDDHARTH NAGAR	USKA BAZAR	83.1164	27.1969	1.29
1069	Uttar Pradesh	Sitapur	Bisawan	80.9242	27.4724	1.76
1070	Uttar Pradesh	Sitapur	Kasmanda	80.8241	27.3680	1.80
1071	Uttar Pradesh	Sitapur	Mahmoodabad	81.1192	27.3034	1.82
1072	Uttar Pradesh	Sitapur	Misrikh	80.5185	27.4109	2.31
1073	Uttar Pradesh	Sitapur	Moholi	80.4675	27.6539	5.01
1074	Uttar Pradesh	Sitapur	Pisawan	80.4201	27.5542	2.55
1075	Uttar Pradesh	Sitapur	Rewsa	81.2087	27.5620	3.65
1076	Uttar Pradesh	Sitapur	Sakaran	81.0173	27.5830	2.18
1077	Uttar Pradesh	Sonbhadra	Chopan	83.1030	24.3440	2.29
1078	Uttar Pradesh	Sonbhadra	Myorpur	82.7700	24.2064	2.06
1079	Uttar Pradesh	Sonbhadra	Roberstganj	83.0760	24.6730	13.95
1080	Uttar Pradesh	St Kabir Nagar	Nathnagar	83.0383	26.6612	4.27
1081	Uttar Pradesh	Sultanpur	Bhetya	81.5647	26.5478	13.02
1082	Uttar Pradesh	Sultanpur	Dhanpatganj	81.9954	26.4416	1.94
1083	Uttar Pradesh	Sultanpur	Jamo	81.6551	26.3359	1.18
1084	Uttar Pradesh	Sultanpur	Shahgarh	81.2457	26.5415	2.62
1085	Uttar Pradesh	Unnao	Asoha	80.8311	26.5861	9.91
1086	Uttar Pradesh	Unnao	Auras	80.5036	26.9067	1.05
1087	Uttar Pradesh	Unnao	Hilauli	80.9406	26.4592	8.58
1088	Uttar Pradesh	Unnao	Miyaganj	80.4844	26.8022	2.43
1089	Uttarakhand	Udham Singh Nagar	Banna Khera	79.1647	29.2633	1.32
1090	Uttarakhand	Udham Singh Nagar	Barianjaniya	79.9225	28.8714	20.93
1091	Uttarakhand	Udham Singh Nagar	Barkhare Pande	78.9639	29.1528	2.43
1092	Uttarakhand	Udham Singh Nagar	Begur Mod	79.6597	28.8756	3.76
1093	Uttarakhand	Udham Singh Nagar	Beria Daulat	79.2372	29.1267	5.54
1094	Uttarakhand	Udham Singh Nagar	Bhagwanpur	79.3464	28.9886	1.34

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1095	Uttarakhand	Udham Singh Nagar	Bharatpur	78.9250	29.2583	1.25
1096	Uttarakhand	Udham Singh Nagar	Bidora	79.7667	28.9369	1.89
1097	Uttarakhand	Udham Singh Nagar	Chakarpur	80.0242	28.9714	67.63
1098	Uttarakhand	Udham Singh Nagar	Dhanauri Patti	79.0158	29.2708	1.59
1099	Uttarakhand	Udham Singh Nagar	Dhyanpur	79.7739	28.9939	4.00
1100	Uttarakhand	Udham Singh Nagar	Durgapur	78.9567	29.2975	19.64
1101	Uttarakhand	Udham Singh Nagar	Gangapur	79.4528	28.9836	3.28
1102	Uttarakhand	Udham Singh Nagar	Jaspur	78.8342	29.2786	4.23
1103	Uttarakhand	Udham Singh Nagar	Jhagarpuri	79.2256	29.0586	2.92
1104	Uttarakhand	Udham Singh Nagar	Kalyanpur	79.6981	28.9886	2.06
1105	Uttarakhand	Udham Singh Nagar	Kanakpur	79.4772	28.9664	1.69
1106	Uttarakhand	Udham Singh Nagar	Kanchanpur(Majhola)	79.8975	28.8311	7.68
1107	Uttarakhand	Udham Singh Nagar	Kashipur	78.9633	29.2125	1.27
1108	Uttarakhand	Udham Singh Nagar	Khatima	79.9661	28.9192	13.59
1109	Uttarakhand	Udham Singh Nagar	Kichha	79.5222	28.9094	1.34
1110	Uttarakhand	Udham Singh Nagar	Missarwala	78.9311	29.2281	1.60
1111	Uttarakhand	Udham Singh Nagar	Nanak Mata	79.8131	28.9475	5.00
1112	Uttarakhand	Udham Singh Nagar	Patthar Chatta	79.4081	29.0306	10.66
1113	Uttarakhand	Udham Singh Nagar	Pattharpui	79.2344	29.0689	1.23
1114	Uttarakhand	Udham Singh Nagar	Pipaliya	79.5406	28.8981	2.11
1115	Uttarakhand	Udham Singh Nagar	Rudrapur	79.4022	28.9969	5.63
1116	Uttarakhand	Udham Singh Nagar	Sarasariya	79.8783	28.9400	24.98
1117	Uttarakhand	Udham Singh Nagar	Shand Khera	79.0136	29.1756	25.13
1118	Uttarakhand	Udham Singh Nagar	Shantipuri	79.5217	28.9986	1.95
1119	Uttarakhand	Udham Singh Nagar	Sitarganj	79.7042	28.9222	16.81
1120	Uttarakhand	Udham Singh Nagar	Sultanpur Patti	79.0583	29.1592	2.31
1121	Uttarakhand	Udham Singh Nagar	Tukri	79.7908	29.0161	1.68
1122	Uttarakhand	Almora	Baniya Diggi	79.4653	29.5939	14.10
1123	Uttarakhand	Almora	Bhoolgaon SP	79.6814	29.7994	37.46
1124	Uttarakhand	Almora	Chanoda	79.6164	29.8056	9.38

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1125	Uttarakhand	Almora	Chhani Bartola	79.6025	29.8328	3.29
1126	Uttarakhand	Almora	Deepakot	79.2972	29.8428	17.24
1127	Uttarakhand	Almora	Dhahnagaon	79.3486	29.9322	57.24
1128	Uttarakhand	Almora	Dhansari	79.3544	29.9086	6.87
1129	Uttarakhand	Almora	Jholi	79.6008	29.6319	14.57
1130	Uttarakhand	Almora	Katarmal	79.6147	29.6392	3.72
1131	Uttarakhand	Almora	Naula	79.2519	29.7358	17.95
1132	Uttarakhand	Almora	Palna	79.6764	29.5708	4.68
1133	Uttarakhand	Almora	Peepal Dhar	79.3547	29.9069	7.87
1134	Uttarakhand	Almora	Simalkhet	79.3414	29.9600	13.71
1135	Uttarakhand	Champawat	Banbasa	80.0722	28.9961	30.49
1136	Uttarakhand	Champawat	Bastia	80.0861	29.1331	1.86
1137	Uttarakhand	Champawat	Bichai	80.0942	29.0408	1.69
1138	Uttarakhand	Dehradun	Baronwala	77.9533	30.3006	28.12
1139	Uttarakhand	Dehradun	Bhatta	78.0850	30.4358	5.06
1140	Uttarakhand	Dehradun	Chandmari	78.1136	30.1736	7.84
1141	Uttarakhand	Dehradun	Duggiawala	78.2336	30.1722	3.12
1142	Uttarakhand	Dehradun	Harbanswala	77.9922	30.3233	11.55
1143	Uttarakhand	Dehradun	Kanwali	78.0072	30.3153	2.29
1144	Uttarakhand	Dehradun	Khadiri (Khadak Maf)	78.2233	30.0644	3.31
1145	Uttarakhand	Dehradun	Khandgaon	78.2050	30.0161	5.26
1146	Uttarakhand	Dehradun	Kotimachak	78.2083	30.2447	10.24
1147	Uttarakhand	Dehradun	Lal Tappar	78.1739	30.1197	1.17
1148	Uttarakhand	Dehradun	Majra	78.0061	30.2983	29.29
1149	Uttarakhand	Dehradun	Nanurkhera	78.0839	30.3333	6.73
1150	Uttarakhand	Dehradun	Purukulgaon	78.0667	30.4103	2.05
1151	Uttarakhand	Haridwar	Bandarjud	77.9386	30.0531	4.31
1152	Uttarakhand	Haridwar	Bhikkampur	78.1417	29.7500	3.19
1153	Uttarakhand	Haridwar	Bhogpur	78.1689	29.7775	3.42
1154	Uttarakhand	Haridwar	Chudiala	77.7581	29.9072	2.10
1155	Uttarakhand	Haridwar	Dalupuri	78.1058	29.7600	6.15
1156	Uttarakhand	Haridwar	Govardhanpur	77.9639	29.7097	6.16
1157	Uttarakhand	Haridwar	Gurukul Narsen	77.9111	29.7133	4.89
1158	Uttarakhand	Haridwar	Hussainpur	77.9969	29.7758	7.00
1159	Uttarakhand	Haridwar	Imlikhera	77.8944	29.9347	23.88
1160	Uttarakhand	Haridwar	Jaswawala	78.6044	30.6031	4.32
1161	Uttarakhand	Haridwar	Jhabreda	77.7758	29.8075	21.86
1162	Uttarakhand	Haridwar	Khera Jat	77.8119	29.6828	1.70
1163	Uttarakhand	Haridwar	Kota Muradnagar	77.9497	29.9722	3.02
1164	Uttarakhand	Haridwar	Laksar	78.0367	30.2586	2.38
1165	Uttarakhand	Haridwar	Librahedi	77.8686	29.7636	8.22
1166	Uttarakhand	Haridwar	Mudlana	77.9139	29.7442	1.48
1167	Uttarakhand	Nainital	Amritpur (Ranibagh)	79.5511	29.2925	12.83
1168	Uttarakhand	Nainital	Belparao	79.2100	29.3114	1.25
1169	Uttarakhand	Nainital	Chilkiya	79.0981	29.3664	2.03
1170	Uttarakhand	Nainital	Dhela	79.0000	29.4181	16.78
1171	Uttarakhand	Nainital	Dogaon	79.5056	29.3286	2.27
1172	Uttarakhand	Nainital	Garampani	79.4819	29.4806	2.18
1173	Uttarakhand	Nainital	Garjiya	79.1419	29.4886	2.75
1174	Uttarakhand	Nainital	Jyolikot	79.4869	29.3417	1.49
1175	Uttarakhand	Nainital	Kathgodam	79.5447	29.2667	1.29
1176	Uttarakhand	Nainital	Kudaghat	79.4603	29.3708	1.64
1177	Uttarakhand	Nainital	Lalkuan	79.5222	29.0744	10.21
1178	Uttarakhand	Nainital	Maldhan Colony	78.9628	29.3197	4.59
1179	Uttarakhand	Nainital	Peeru Madara	79.0633	29.3364	14.41

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1180	Uttarakhand	Pauri Garhwal	Ramdayanpur	78.4433	29.7788	3.88
1181	Uttarakhand	Uttarkashi	Barkot	78.2111	30.8092	4.79
1182	Uttarakhand	Uttarkashi	Charethi HP *	78.6264	30.8211	3.15
1183	Uttarakhand	Uttarkashi	Dharasu	78.3147	30.6003	1.31
1184	Uttarakhand	Uttarkashi	Ganganani Spring outlet 2	78.6800	30.9031	2.95
1185	Uttarakhand	Uttarkashi	Maneri	78.5247	30.7397	1.52
1186	Uttarakhand	Uttarkashi	Ratodi Sar	78.3592	30.7439	27.28
1187	Uttarakhand	Uttarkashi	Uttarkashi	78.4211	30.7322	3.91
1188	West Bengal	Alipurduar	Barovisa More	89.7983	26.4731	1.64
1189	West Bengal	Bankura	Basudevpur Anchal	87.3700	23.0419	4.19
1190	West Bengal	Bankura	Punisole	87.1494	23.1708	3.62
1191	West Bengal	Bankura	Taldangra	87.0964	23.0336	2.78
1192	West Bengal	Bardhaman	Amirpur	87.9294	23.2042	2.80
1193	West Bengal	Bardhaman	Bara Damas	88.2072	23.1672	1.18
1194	West Bengal	Bardhaman	Bolgona	87.9397	23.4611	7.30
1195	West Bengal	Bardhaman	Chupi	88.3444	23.4667	1.35
1196	West Bengal	Bardhaman	Galigram	87.6528	23.3592	1.12
1197	West Bengal	Bardhaman	Paraj More	87.6069	23.3794	3.95
1198	West Bengal	Bardhaman	Piala	87.3033	23.5281	1.21
1199	West Bengal	Bardhaman	Piariganj	87.4703	23.5383	46.53
1200	West Bengal	Bardhaman	Sillaghat	87.5717	23.2883	1.64
1201	West Bengal	Birbhum	Bimuria	87.6372	23.6678	2.26
1202	West Bengal	Birbhum	Damra	87.6689	24.1050	1.36
1203	West Bengal	Birbhum	Paikpara	87.6969	23.8542	3.91
1204	West Bengal	Birbhum	Supur	87.7025	23.6692	1.79
1205	West Bengal	Dakshin Dinajpur	Balurghat	88.7920	25.2324	4.28
1206	West Bengal	Dakshin Dinajpur	Dhelpir	88.5610	25.3271	3.21
1207	West Bengal	Dakshin Dinajpur	Hilli	88.9965	25.2775	1.24
1208	West Bengal	Dakshin Dinajpur	Udaipur	88.4733	25.5558	1.27
1209	West Bengal	Darjeeling	Batasi	88.1806	26.6025	8.47
1210	West Bengal	Darjeeling	Jabra More	88.2219	26.7406	1.51
1211	West Bengal	Darjeeling	Kalaram Ghoshpara	88.2772	26.5894	1.23
1212	West Bengal	Darjeeling	Rangapani	88.3694	26.6486	3.34
1213	West Bengal	Howrah	Amta(2)	88.0075	22.5800	1.65
1214	West Bengal	Howrah	Bardabar	88.0319	22.3058	2.09
1215	West Bengal	Howrah	Burikhali	88.1694	22.5094	1.50
1216	West Bengal	Howrah	Mugkalayan	87.9781	22.4128	1.72
1217	West Bengal	Hugli	Bankipur	88.4314	23.1472	1.09
1218	West Bengal	Hugli	Dash Darun	88.3647	23.0553	6.97
1219	West Bengal	Hugli	Dwarpara	88.4133	23.1031	4.53
1220	West Bengal	Hugli	Gopal Prasadpur	88.0467	22.7953	3.60
1221	West Bengal	Hugli	Itachuna Deep	88.3119	23.0331	1.06
1222	West Bengal	Hugli	Kaknan Pz	87.7853	22.6803	1.11
1223	West Bengal	Hugli	Kamur	88.2997	23.1108	3.51
1224	West Bengal	Jalpaiguri	Hathi More	88.5131	26.5819	1.69
1225	West Bengal	Jalpaiguri	Khalai Gram	89.0533	26.5611	8.99
1226	West Bengal	Jalpaiguri	Phulbari Hat	89.1406	26.7142	1.02
1227	West Bengal	Jalpaiguri	Radhabari	88.4494	26.6244	9.22
1228	West Bengal	Kochbihar	Kholta Kalibari	89.5192	26.4561	21.87
1229	West Bengal	Kolkata	Rajabazar	88.3719	22.5672	1.10
1230	West Bengal	Malda	Pagla Bridge	87.9913	24.8503	1.85
1231	West Bengal	Malda	Pandua	88.1535	25.1286	2.03
1232	West Bengal	Murshidabad	Barala	88.0086	24.4278	1.37
1233	West Bengal	Murshidabad	Begunbari	88.2775	23.9214	4.53
1234	West Bengal	Murshidabad	Beikibagan	88.4625	24.2661	1.37

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1235	West Bengal	Murshidabad	Dakshin Khandagram	88.0744	23.7514	1.48
1236	West Bengal	Murshidabad	Daulatabad	88.3756	24.1436	5.37
1237	West Bengal	Murshidabad	Gokarna	88.1111	24.0347	26.91
1238	West Bengal	Murshidabad	Islampur Tw	88.4703	24.1497	4.81
1239	West Bengal	Murshidabad	Jiaganj	88.2586	24.2428	1.20
1240	West Bengal	Murshidabad	Jibanti	88.1703	24.0864	1.02
1241	West Bengal	Murshidabad	Kalokhali	88.2953	24.2933	1.39
1242	West Bengal	Murshidabad	Kanchan Garia	88.1372	23.8847	2.22
1243	West Bengal	Murshidabad	Kashipur	88.4153	24.3175	3.68
1244	West Bengal	Murshidabad	Kholilabad	88.4394	24.0933	1.77
1245	West Bengal	Murshidabad	Lalbagh	88.2836	24.1708	3.04
1246	West Bengal	Murshidabad	Lalgola Pz-2	88.2519	24.4100	1.21
1247	West Bengal	Murshidabad	Lohadaha	88.1786	23.8850	1.45
1248	West Bengal	Murshidabad	Manoharpur	88.0569	23.9775	1.75
1249	West Bengal	Murshidabad	Mirzapur	88.0686	24.4083	4.91
1250	West Bengal	Murshidabad	Nasipur	88.3861	24.3069	1.68
1251	West Bengal	Murshidabad	Nasipur	88.4125	24.0319	3.96
1252	West Bengal	Murshidabad	Panchgram	88.0136	24.1983	2.69
1253	West Bengal	Murshidabad	Piprakhali	88.4561	23.9839	7.30
1254	West Bengal	Murshidabad	Raghunathganj	88.0650	24.4608	2.72
1255	West Bengal	Murshidabad	Ramakantapur	88.0556	24.5536	5.63
1256	West Bengal	Murshidabad	Ranjitpara	88.3139	24.1647	9.93
1257	West Bengal	Murshidabad	Saktipur	88.1964	23.8619	1.46
1258	West Bengal	Murshidabad	Swarupnagar	88.2775	23.9211	2.58
1259	West Bengal	Murshidabad	Tartipur	88.4394	24.0933	3.78
1260	West Bengal	Murshidabad	Tehghari-rampura	88.1381	24.4506	3.52
1261	West Bengal	N24 Parganas	Aminpur Bazar	88.5792	22.6722	1.32
1262	West Bengal	N24 Parganas	Bagaband	88.5306	22.6689	6.36
1263	West Bengal	N24 Parganas	Bagdah	88.8942	23.2111	2.55
1264	West Bengal	N24 Parganas	Baidyapur	88.5972	22.6983	1.34
1265	West Bengal	N24 Parganas	Banipur	88.6353	22.8208	3.25
1266	West Bengal	N24 Parganas	Bathania-Baruipara	88.5597	22.7958	4.82
1267	West Bengal	N24 Parganas	Berachampa	88.6781	22.6931	1.07
1268	West Bengal	N24 Parganas	Berghoom	88.7083	22.8678	4.74
1269	West Bengal	N24 Parganas	Bhandarkola	88.7044	23.0053	1.74
1270	West Bengal	N24 Parganas	Boyra	88.9786	23.2114	1.92
1271	West Bengal	N24 Parganas	Chandpara	88.7836	22.9758	1.31
1272	West Bengal	N24 Parganas	Chauberia	88.6833	22.9764	7.23
1273	West Bengal	N24 Parganas	Chowmoha	88.5494	22.6489	10.60
1274	West Bengal	N24 Parganas	Dakhin Akartala	88.8528	22.4503	3.93
1275	West Bengal	N24 Parganas	Digberia	88.4922	22.6942	2.53
1276	West Bengal	N24 Parganas	Dutta pukur	88.5458	22.7614	2.50
1277	West Bengal	N24 Parganas	Ghusighata	88.6883	22.5214	1.52
1278	West Bengal	N24 Parganas	Gobrapur	88.8125	24.1678	4.38
1279	West Bengal	N24 Parganas	Gopalnagar	88.7753	23.0650	2.22
1280	West Bengal	N24 Parganas	Gopalpur (Bablatala - Udaichai)	88.4550	22.6369	1.77
1281	West Bengal	N24 Parganas	Habra	88.6658	22.8519	2.21
1282	West Bengal	N24 Parganas	Helencha	88.8594	23.1864	2.53
1283	West Bengal	N24 Parganas	Ichapur Nababga	88.3564	22.7981	1.01
1284	West Bengal	N24 Parganas	Jayantipur Bazar (Petrapple)	88.8736	23.0381	5.44
1285	West Bengal	N24 Parganas	Kalupur Dakshinpara	88.8406	23.0158	2.59
1286	West Bengal	N24 Parganas	Kansona	88.7489	23.0703	1.22
1287	West Bengal	N24 Parganas	Mirja nagar	88.6889	22.7069	1.59

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1288	West Bengal	N24 Parganas	Neta ji Palli	88.9167	23.1992	5.88
1289	West Bengal	N24 Parganas	Rajapur	88.7342	22.9617	4.68
1290	West Bengal	N24 Parganas	Rajarhat	88.4710	22.6362	1.03
1291	West Bengal	N24 Parganas	Ramchandrapur	88.8436	22.9444	4.50
1292	West Bengal	N24 Parganas	Rangamahall	88.5244	22.8153	1.52
1293	West Bengal	N24 Parganas	Rangmahal	88.5253	22.8153	6.77
1294	West Bengal	N24 Parganas	Sodpur	88.3744	22.6992	2.63
1295	West Bengal	N24 Parganas	Srinagar Matia	88.7753	22.6697	3.26
1296	West Bengal	N24 Parganas	Suria	88.5497	22.8539	3.03
1297	West Bengal	N24 Parganas	Swarupnagar	88.8572	22.8158	3.59
1298	West Bengal	N24 Parganas	Tentulia	88.7014	22.9003	3.04
1299	West Bengal	N24 Parganas	Thakurnagar	88.7750	22.9278	1.33
1300	West Bengal	Nadia	Bahadurpur	88.4633	23.4392	1.42
1301	West Bengal	Nadia	Bhatjangla	88.4853	23.3756	1.28
1302	West Bengal	Nadia	Bishnupur	88.4175	23.3800	1.18
1303	West Bengal	Nadia	Choko-andulia M-ii Tw	88.5536	23.5231	2.03
1304	West Bengal	Nadia	Chougacha-Kutirpara More	88.6675	23.4242	6.67
1305	West Bengal	Nadia	Chukhali	88.5147	23.4250	2.88
1306	West Bengal	Nadia	Debnathpur M-ii Tw	88.5467	23.7739	1.87
1307	West Bengal	Nadia	Duttaphulia	88.6914	23.2442	1.61
1308	West Bengal	Nadia	Harishnagar	88.7783	23.4742	1.56
1309	West Bengal	Nadia	Jahangirpur Mark-ii Tw	88.4556	23.3900	2.50
1310	West Bengal	Nadia	Kaliganj	88.2306	23.7308	6.15
1311	West Bengal	Nadia	Krishnaganj	88.7042	23.4139	3.80
1312	West Bengal	Nadia	Mayapur	88.3847	23.4158	2.42
1313	West Bengal	Nadia	Mazdia	88.7197	23.4147	2.58
1314	West Bengal	Nadia	Palassey Para	88.4514	23.7853	3.15
1315	West Bengal	Nadia	Panikhali bazar	88.6581	23.2336	1.22
1316	West Bengal	Nadia	Paninala	88.5128	23.4317	1.84
1317	West Bengal	Nadia	Shakdaha more	88.6508	23.4269	2.37
1318	West Bengal	Paschim Medinipur	Bakhrabad	87.3697	22.1222	8.17
1319	West Bengal	Paschim Medinipur	Nekurseni	87.3058	22.0044	11.24
1320	West Bengal	Paschim Medinipur	Rajnagar	87.6697	22.5769	3.40
1321	West Bengal	Paschim Medinipur	Sankarara	87.4261	21.8736	5.21
1322	West Bengal	Purba Medinipur	Dharampur	87.5583	21.7128	1.57
1323	West Bengal	Purba Medinipur	Khejuri	87.9761	21.8750	1.59
1324	West Bengal	Purba Medinipur	Mangal Maro	87.6406	22.0817	1.09
1325	West Bengal	Purba Medinipur	Uttar Boyal	87.9569	22.0861	2.07
1326	West Bengal	South 24 Parganas	Baruipur	88.7998	22.6083	1.33
1327	West Bengal	South 24 Parganas	Bhojerhat	88.5800	22.4400	5.02
1328	West Bengal	South 24 Parganas	Champahati	88.5003	22.4025	5.30
1329	West Bengal	South 24 Parganas	Dhapa	88.6697	22.9353	3.88
1330	West Bengal	South 24 Parganas	Dhopagachi	88.4006	22.3675	2.03
1331	West Bengal	South 24 Parganas	Gobindapur	88.4125	22.3903	21.27
1332	West Bengal	South 24 Parganas	Khanrapara	88.4314	22.0711	3.37
1333	West Bengal	South 24 Parganas	Kumarhat	88.4508	22.3164	14.18
1334	West Bengal	South 24 Parganas	Noabad(8/97)	88.4464	22.4678	4.97
1335	West Bengal	South 24 Parganas	Padma Jola	88.4708	22.3156	1.87
1336	West Bengal	South 24 Parganas	Raibaghini More	88.6575	22.3058	1.47

S. No	State	District	Site Name	Longitude	Latitude	Iron (mg/mL)
1337	West Bengal	South 24 Parganas	Ramdhari	88.5714	22.3436	4.53
1338	West Bengal	South 24 Parganas	Uttar Hajipur	88.4640	22.3010	1.00
1339	West Bengal	Uttar Dinajpur	Baghan (Bhandar)	88.2953	25.6437	1.61
1340	West Bengal	Uttar Dinajpur	Chopra	88.3067	26.3595	8.81
1341	West Bengal	Uttar Dinajpur	Hemtabad	88.2163	25.6789	3.23
1342	West Bengal	Uttar Dinajpur	Koiladangi	88.1893	25.7877	1.14
1343	West Bengal	Uttar Dinajpur	Lohagara	88.1171	25.7079	2.21
1344	West Bengal	Uttar Dinajpur	Madaripur	88.2608	26.3093	5.60
1345	West Bengal	Uttar Dinajpur	Sripur (Itahar)	88.1761	25.4942	1.53

Annexure-VI**Locations Having Arsenic > 0.01 mg/L (>10 ppb) in Ground Water in Different States/ UT of India**

S. No.	State	District	Site Name	Longitude	Latitude	Arsenic (µg/mL)
1	Andhra Pradesh	Ananthapur	Waddipalli	77.4583	14.6717	16.24
2	Andhra Pradesh	East Godavari	Appanapalle-DW14	81.9236	16.5300	18.41
3	Andhra Pradesh	East Godavari	Komaragiri-DW14	82.1806	16.6964	14.28
4	Andhra Pradesh	East Godavari	Munganda-PZ	81.9161	16.5975	17.93
5	Andhra Pradesh	East Godavari	Selkavedhi-DW14	81.6739	17.4603	12.90
6	Andhra Pradesh	Guntur	Bhattiprolu-DW	80.7528	16.0867	10.57
7	Andhra Pradesh	Guntur	Cheruvu Jamulapalem	80.4450	15.9339	24.83
8	Andhra Pradesh	Guntur	Guttikonda	79.8361	16.4278	17.49
9	Andhra Pradesh	Guntur	Jonnalagadda-DW14	80.0831	16.2436	21.11
10	Andhra Pradesh	Guntur	Motupalem	80.5653	15.9319	34.02
11	Andhra Pradesh	Guntur	Murjampadu	79.8833	16.5833	22.79
12	Andhra Pradesh	Guntur	Pallapatla-DW	80.7600	15.9700	41.66
13	Andhra Pradesh	Guntur	Punnapalle-DW14	80.6975	16.0569	35.00
14	Andhra Pradesh	Guntur	Repalle	80.8444	16.0233	17.51
15	Andhra Pradesh	Guntur	Rompicherla	79.9092	16.2236	12.39
16	Andhra Pradesh	Guntur	Tadikonda-DW	80.4522	16.4164	21.78
17	Andhra Pradesh	Guntur	Varagami	80.3083	16.0764	12.57
18	Andhra Pradesh	Krishna	Nadupur-DW14	81.1322	16.2803	13.01
19	Andhra Pradesh	Kurnool	Gulyam-DW13	77.1417	15.3667	38.84
20	Andhra Pradesh	Nellore	Kastam Pahad-DW14	79.5386	14.6794	51.91
21	Andhra Pradesh	Prakasam	Vadarevu-DW14	80.4108	15.7972	13.70
22	Andhra Pradesh	Prakasam	Vengaihpalem	79.5939	15.9222	10.37
23	Bihar	Araria	Bhargama	87.1500	26.0500	15.37
24	Bihar	Araria	Hariapur	87.2300	26.2600	10.21
25	Bihar	Araria	Raniganj	87.2300	26.0700	14.18
26	Bihar	Begusarai	Badalpura	86.1500	25.3800	18.36
27	Bihar	Begusarai	Barun'O'	85.9700	25.4600	22.29
28	Bihar	Begusarai	Dariarpur	86.2300	25.3600	21.29
29	Bihar	Begusarai	Gopalpur	86.2000	25.4400	18.92
30	Bihar	Begusarai	Heera Tola	86.4400	25.4600	80.82
31	Bihar	Begusarai	Kaithma	86.1500	25.3900	11.86
32	Bihar	Begusarai	Mohanpur Usrai	86.1300	25.5100	13.60
33	Bihar	Begusarai	Naya Nahar, Dularpur	85.9200	25.5100	18.24
34	Bihar	Begusarai	Sabdapur	86.4300	25.4200	10.66
35	Bihar	Begusarai	Simri	86.2200	25.6000	20.69
36	Bihar	Bhagalpur	Madrauni Chowk	87.1700	25.4000	18.62
37	Bihar	Bhagalpur	Marwa	86.9200	25.4000	42.22
38	Bihar	Bhojpur	Balua	84.5600	25.4900	18.91
39	Bihar	Bhojpur	Farhda	84.6500	25.6800	26.20
40	Bihar	Bhojpur	Harnath Kundi	84.5700	25.5700	20.70
41	Bihar	Bhojpur	Jagatpur	84.6000	25.6700	18.01
42	Bihar	Bhojpur	Jarawarpur Milki	84.5300	25.6000	117.26
43	Bihar	Bhojpur	Karnempur	84.3600	25.6700	260.99
44	Bihar	Bhojpur	Kulharia	84.7500	25.5800	10.95
45	Bihar	Bhojpur	Rajapur Bazar	84.7900	25.6400	16.33
46	Bihar	Bhojpur	Simariya	84.7200	25.6700	71.91
47	Bihar	Bhojpur	Songhata	84.7600	25.6100	43.80
48	Bihar	Buxar	Barka Rajpur	84.1300	25.6800	67.46

S. No.	State	District	Site Name	Longitude	Latitude	Arsenic (µg/mL)
49	Bihar	Buxar	Karathar	84.1800	25.6500	45.60
50	Bihar	Buxar	Manikpur	84.0900	25.6700	95.46
51	Bihar	Buxar	Neazipur	84.1400	25.6800	288.94
52	Bihar	Darbhanga	Bithauli	86.0900	26.0100	13.43
53	Bihar	E. Champaran	Bairiya Bazar	84.8400	26.6100	92.91
54	Bihar	E. Champaran	Belai	85.0700	26.7000	15.88
55	Bihar	E. Champaran	Bhakatiy Tola	85.1100	26.7900	28.40
56	Bihar	E. Champaran	Lakhwara	84.9800	26.7600	23.12
57	Bihar	E. Champaran	Ghorasahan	85.1400	26.8200	14.30
58	Bihar	E. Champaran	Murarpur	84.8100	26.6000	29.07
59	Bihar	E. Champaran	Patahi	85.1700	26.5800	49.46
60	Bihar	E. Champaran	Sugauli Bazar	84.9500	26.9200	17.95
61	Bihar	Gopalganj	Phulwariya	84.5200	26.4000	14.03
62	Bihar	Katihar	Katihar	87.6000	25.5400	12.17
63	Bihar	Khagaria	Jamalpur (Gogri Jamalpur)	86.6400	25.4300	249.78
64	Bihar	Khagaria	Khagaria	86.4800	25.4900	15.42
65	Bihar	Khagaria	Maheshkhunt -1	86.6400	25.4600	18.93
66	Bihar	Kishanganj	Bahadurganj	87.8400	26.2600	12.12
67	Bihar	Kishanganj	Kaswa Kaliganj	88.1400	26.3500	32.39
68	Bihar	Madhepura	Rampur	86.9400	25.8900	12.06
69	Bihar	Madhubani	Bentadih	86.1300	26.4500	30.02
70	Bihar	Madhubani	Bhawanipur	86.1300	26.2500	13.21
71	Bihar	Madhubani	Bideshwar Asthan	86.2200	26.2400	11.03
72	Bihar	Madhubani	Jhanjharpur	86.2800	26.2700	10.33
73	Bihar	Madhubani	Phulparas	86.1000	26.2600	37.55
74	Bihar	Madhubani	Siswar	86.4600	26.4200	43.11
75	Bihar	Muzaffarpur	Gargalia (Minapur)	85.3500	26.0500	10.81
76	Bihar	Muzaffarpur	Paroo	85.1400	26.2800	31.36
77	Bihar	Muzaffarpur	Sarfuddin-Pur (Bawan Bigha)	84.9300	26.3000	28.10
78	Bihar	Muzaffarpur	Shukrahat (Maidapur)	84.9500	26.3000	51.00
79	Bihar	Samastipur	Kalyanpur	85.9100	25.7100	13.63
80	Bihar	Saran	Nayagaon	85.0900	25.7600	16.20
81	Bihar	Sheohar	Ganeshpur	85.3000	26.5100	69.62
82	Bihar	Sheohar	Sarbarpur	85.3200	26.4300	47.70
83	Bihar	Sitamarhi	Bangaon	85.6300	26.5500	25.85
84	Bihar	Sitamarhi	Bhutahi	85.5500	26.7300	85.87
85	Bihar	Sitamarhi	Kodug Wellara Tola	85.4700	26.5900	11.11
86	Bihar	Supaul	Bhimnagar	87.0300	26.5200	11.70
87	Bihar	Supaul	Birpur	86.6000	26.1000	11.97
88	Bihar	Supaul	Karjain	86.8200	26.3000	10.74
89	Bihar	Supaul	Station Rd	86.6100	26.1200	12.35
90	Bihar	W Champaran	Shishwania	84.3600	27.0000	35.86
91	Bihar	W. Champaran	Belwa	84.1700	27.0800	20.10
92	Bihar	W. Champaran	Gurwalia	84.4400	26.9100	31.20
93	Bihar	W. Champaran	Korigawa Chowk	84.4300	27.1400	17.12
94	Bihar	W. Champaran	Naurangia	83.9400	27.2800	53.08
95	Chattisgarh	Koriya	Mohra	82.6348	22.3619	11.95
96	Chattisgarh	Raigarh	Kondatarai	83.3578	21.8255	31.53
97	Chattisgarh	Raigarh	Koshmanda	83.3956	21.7715	15.19
98	Chattisgarh	Raipur	Kanki	81.9920	21.4003	10.93
99	Chattisgarh	Raipur	Kendri	81.7411	21.1016	10.48
100	Chattisgarh	Raipur	Mandirhasud	81.7667	21.2208	35.43
101	Chattisgarh	Raipur	Sakara	81.6569	21.3542	34.42
102	Delhi	Delhi	Nizamuddin Bridge 2 PZ	77.2661	28.6047	52.58
103	Gujarat	Mahesana	Vidaj	72.2976	23.2481	10.52

S. No.	State	District	Site Name	Longitude	Latitude	Arsenic (µg/mL)
104	Haryana	Bhiwani	Chirya	76.2583	28.4583	15.92
105	Haryana	Sonipat	Bhunderi	76.6153	29.1000	19.67
106	Jammu	Kupwara	Darashpora	74.2704	34.3854	15.67
107	Jammu	Samba	Gho-Rakhwalan	74.9500	32.5500	11.15
108	Jharkhand	Sahibganj	Rajmahal	87.4900	25.0300	31.87
109	Karnataka	Gadag	Shirhatti1	75.5675	15.2292	13.34
110	Karnataka	Raichur	Kalamangi	77.2669	16.2708	10.55
111	Kerala	Kollam	Pozhikara	76.6569	8.8119	11.43
112	Madhya Pradesh	Datia	Ruduapura	79.8860	23.1530	10.26
113	Madhya Pradesh	Morena	Tentra	79.0170	24.1340	13.65
114	Madhya Pradesh	Morena	Tonga Gaon	78.5830	24.2160	14.20
115	Maharashtra	Bhandara	Paunarkhairi	79.7047	21.5350	31.19
116	Maharashtra	Mumbai City	Colaba-Fort	72.8367	18.9381	23.21
117	Odisha	Bhadrak	Kenduapada	86.3711	21.0217	11.00
118	Odisha	Ganjam	Berhampur1	84.7917	19.3667	147.00
119	Odisha	Jagatsinghpur	Nuagaon	86.5372	20.2214	11.00
120	Odisha	Kendrapara	Jajanga	86.4419	20.5233	15.00
121	Punjab	Amritsar	Gaggomahal	74.6667	31.9000	43.44
122	Punjab	Amritsar	Ramdas	74.9172	31.9667	60.22
123	Punjab	Amritsar	Urdhan	74.8661	31.8786	60.07
124	Punjab	Bathinda	Dhopali	75.2417	30.3625	11.31
125	Punjab	Fazilka	Dipulana	74.0986	30.4528	72.63
126	Punjab	Fazilka	Swahwala	74.3103	30.6275	11.85
127	Punjab	Gurdaspur	Dera Baba Nanak	75.0333	32.0125	23.79
128	Punjab	Gurdaspur	Mullo Wali	75.0083	31.9917	10.41
129	Punjab	Gurdaspur	Saleh Chok	75.1833	32.0500	18.95
130	Punjab	Hoshiarpur	Chak Sheru	75.6244	32.0511	10.36
131	Punjab	Hoshiarpur	Rampur Camp Colony	75.9472	31.5028	30.78
132	Punjab	Kapurthala	Sultanpur Lodhi	75.2000	31.2194	23.31
133	Punjab	Pathankot	Bham	75.4583	31.7167	14.29
134	Punjab	Patiala	Behmana	76.1347	30.1789	13.53
135	Punjab	Sas Nagar	Banur	76.5861	30.4925	23.31
136	Punjab	Tarn Taran	Barwala	74.8035	31.2240	12.74
137	Punjab	Tarn Taran	Bhikhi Wind	74.7000	31.3500	15.57
138	Punjab	Tarn Taran	Goindwal Sahib	75.1444	31.3653	10.23
139	Rajasthan	Banswara	Bhura Kua	74.3100	23.2250	11.19
140	Rajasthan	Bhilwara	Bhagwanpura	75.0600	25.4700	11.84
141	Rajasthan	Bhilwara	Gangapur1	74.2597	25.2167	15.61
142	Rajasthan	Bhilwara	Mandalgarh1	75.0900	25.1800	17.87
143	Rajasthan	Churu	Dhirawas	74.9100	28.8400	26.20
144	Rajasthan	Ganganagar	22gb Chak	73.5917	29.2639	39.65
145	Rajasthan	Ganganagar	Sardarpura	74.1700	29.2800	12.62
146	Rajasthan	Ganganagar	Sunderpura_DW	74.0900	29.8000	42.67
147	Rajasthan	Hanumangarh	Dungrana	75.0972	29.0139	17.40
148	Rajasthan	Hanumangarh	Nohar1	74.7667	29.2806	13.40
149	Rajasthan	Jodhpur	Dhawa	72.7400	26.0600	10.62
150	Rajasthan	Sirohi	Sirohi	72.8667	24.8833	18.78
151	Rajasthan	Tonk	Todaraisingh1	75.4889	26.0225	15.91
152	Tamil Nadu	Chennai	Tiruvottiyur	80.3100	13.1600	12.20
153	Tamil Nadu	Cuddalore	Keelpuvanikuppam DW	79.7189	11.6011	22.01
154	Tamil Nadu	Dharmapuri	Mullaivanam	78.6291	12.0973	15.64
155	Tamil Nadu	Nagapattinam	Akkaraipettai	79.8503	10.7442	22.54
156	Tamil Nadu	Nagapattinam	Thamaraipulam	79.8292	10.4781	11.68
157	Tamil Nadu	Nagapattinam	Thetakudi	79.8364	10.4178	22.63
158	Tamil Nadu	Pondicherry	Pondicherry	79.8233	11.9119	12.68

S. No.	State	District	Site Name	Longitude	Latitude	Arsenic (µg/mL)
159	Tamil Nadu	Ramanathapuram	Devipattanam	78.9000	9.4708	30.54
160	Tamil Nadu	Ramanathapuram	Mandapam	79.1667	9.2833	17.93
161	Tamil Nadu	Ramanathapuram	Mukundarayar Chatram (Dhanushkodi)	79.3794	9.2008	10.25
162	Tamil Nadu	Ramanathapuram	Nadumanaikadu	79.0583	9.2833	59.63
163	Tamil Nadu	Ramanathapuram	Rameswaram	79.2750	9.2833	54.60
164	Tamil Nadu	Ramanathapuram	Thangachimadam	79.0139	9.2842	11.97
165	Tamil Nadu	Ramanathapuram	Tirupulani	78.7653	9.2611	14.92
166	Tamil Nadu	Sivaganga	Puduvoyal	78.8444	10.1042	14.54
167	Tamil Nadu	Tiruvallur	Gummidipoondi	80.1300	13.4000	11.57
168	Tamil Nadu	Tuticorin	Kulashekarapatnm	78.0542	8.4000	21.21
169	Telangana	Nalgonda	Kudakuda-DW13	79.6444	17.1817	19.72
170	Telangana	Nalgonda	Suryapet-PZ	79.6236	17.1333	17.75
171	Uttar Pradesh	Azamgarh	Mohammadpur	83.0281	25.9621	16.35
172	Uttar Pradesh	Bahraich	Tejwapur	81.6245	27.5984	18.14
173	Uttar Pradesh	Ballia	Bairya	84.4734	25.7769	31.70
174	Uttar Pradesh	Ballia	Belhari	84.2934	25.7363	15.87
175	Uttar Pradesh	Ballia	Dubahar	84.2393	27.4450	44.04
176	Uttar Pradesh	Ballia	Murali Chhapara	84.5165	25.7282	33.97
177	Uttar Pradesh	Ballia	Reoti	84.3718	25.8418	24.17
178	Uttar Pradesh	Ballia	Sohaon	84.0040	25.6293	53.14
179	Uttar Pradesh	Banda	Banda	80.0901	28.2266	12.40
180	Uttar Pradesh	Banda	Dadraul	79.8652	27.8999	16.79
181	Uttar Pradesh	Basti	Gaur	82.4500	26.8214	99.61
182	Uttar Pradesh	Basti	Parasrampur	82.3397	26.9050	20.27
183	Uttar Pradesh	Basti	Saunghat	82.6454	26.7904	28.85
184	Uttar Pradesh	Basti	Vikramjot	82.3658	26.7803	43.61
185	Uttar Pradesh	Bijnor	Afzal Ghar	78.6914	29.3818	43.51
186	Uttar Pradesh	Bijnor	Aku	78.3700	29.3232	11.73
187	Uttar Pradesh	Bijnor	Kiratpur	78.2696	29.4966	10.11
188	Uttar Pradesh	Bijnor	Mohammadpur	78.1149	29.4744	10.42
189	Uttar Pradesh	Bijnor	Noorpur	78.4010	29.1469	21.50
190	Uttar Pradesh	Faizabad	Haringtonganj	82.0196	26.5581	16.54
191	Uttar Pradesh	Gonda	Colonelganj	81.6956	27.1339	11.55
192	Uttar Pradesh	Gonda	Haldharmau	81.7611	27.1389	37.89
193	Uttar Pradesh	Gonda	Tarab Ganj	82.9955	26.7800	47.03
194	Uttar Pradesh	Hardoi	Shahabad	79.9170	27.5940	24.18
195	Uttar Pradesh	Hardoi	Tadiyawan	80.2750	27.4340	20.22
196	Uttar Pradesh	Lakhimpur Khiri	Ishanagar	81.1800	27.8760	34.15
197	Uttar Pradesh	Lakhimpur Khiri	Nakaha	80.9120	27.9060	21.95
198	Uttar Pradesh	Lakhimpur Khiri	Nighasan	80.9250	28.2480	33.43
199	Uttar Pradesh	Lakhimpur Khiri	Palia Kalan	80.6720	28.4160	29.18
200	Uttar Pradesh	Moradabad	Bhagatpur	78.8512	28.9580	18.85
201	Uttar Pradesh	Moradabad	Chhajlet	78.6333	28.9867	16.63
202	Uttar Pradesh	Moradabad	Deengarpur	78.7126	28.7007	11.45
203	Uttar Pradesh	Moradabad	Moondhapanday	78.9102	28.8117	19.22
204	Uttar Pradesh	Muzaffarnagar	Purkaji	77.8386	29.6544	13.29
205	Uttar Pradesh	Pilibhit	Bar Khera	79.8067	28.4663	12.14
206	Uttar Pradesh	Pratapgarh	Rampur-Sangramgarh	81.6228	25.9594	13.63
207	Uttar Pradesh	Rampur	Milak	79.1797	28.6066	21.69
208	Uttar Pradesh	Shrawasti	Hariharpur Rani	81.9367	27.7069	10.45
209	Uttar Pradesh	Siddharth Nagar	Bansi	82.9294	27.3053	30.56
210	Uttar Pradesh	Siddharth Nagar	Barhani	82.7672	27.3083	23.39
211	Uttar Pradesh	Siddharth Nagar	Birdpur	83.0997	27.2147	22.69
212	Uttar Pradesh	Siddharth Nagar	Jogiya	83.0081	27.2528	12.44

S. No.	State	District	Site Name	Longitude	Latitude	Arsenic (µg/mL)
213	Uttar Pradesh	Sitapur	Rampur Mathura	81.3282	27.3672	14.52
214	Uttar Pradesh	St Kabir Nagar	Nathnagar	83.0383	26.6612	14.94
215	Uttar Pradesh	St Kabir Nagar	Pauli	82.9019	26.5858	21.74
216	Uttar Pradesh	Sultanpur	Kurwar	81.9653	26.3457	16.98
217	Uttarakhand	Udham Singh Nagar	Bidora	79.7667	28.9369	21.03
218	Uttarakhand	Udham Singh Nagar	Dhanauri Patti	79.0158	29.2708	13.13
219	Uttarakhand	Udham Singh Nagar	Durgapur	78.9567	29.2975	45.30
220	Uttarakhand	Udham Singh Nagar	Jaspur	78.8342	29.2786	22.77
221	Uttarakhand	Udham Singh Nagar	Shand Khera	79.0136	29.1756	69.79
222	Uttarakhand	Champawat	Bichai	80.0942	29.0408	62.54
223	Uttarakhand	Dehradun	Duggiawala	78.2336	30.1722	11.45
224	Uttarakhand	Dehradun	Judli	77.6956	30.4239	71.28
225	Uttarakhand	Dehradun	Maldeota	78.1203	30.3439	22.86
226	Uttarakhand	Dehradun	Redapur	77.8633	30.4058	11.05
227	Uttarakhand	Dehradun	Soda Saroli	78.1394	30.2767	28.54
228	Uttarakhand	Haridwar	Bandarjud	77.9386	30.0531	23.20
229	Uttarakhand	Haridwar	Chudiala	77.7581	29.9072	11.43
230	West Bengal	Howrah	Bauria(11/89)	88.1783	22.4986	12.19
231	West Bengal	Hugli	Balagarh	88.4664	23.1261	19.68
232	West Bengal	Hugli	Dwarpara	88.4133	23.1031	12.24
233	West Bengal	Malda	Mothabari	88.0363	24.9296	33.94
234	West Bengal	Malda	Kaliachak (Thakurbari)	88.0082	24.8546	76.73
235	West Bengal	Malda	Mohana-I	87.9216	25.0870	10.88
236	West Bengal	Malda	Pagla Bridge	87.9913	24.8503	129.10
237	West Bengal	Murshidabad	Begunbari	88.2775	23.9214	27.90
238	West Bengal	Murshidabad	Daulatabad	88.3756	24.1436	81.48
239	West Bengal	Murshidabad	Islampur TW	88.4703	24.1497	26.03
240	West Bengal	Murshidabad	Kalokhali	88.2953	24.2933	23.80
241	West Bengal	Murshidabad	Kashipur	88.4153	24.3175	48.56
242	West Bengal	Murshidabad	Kholilabad	88.4394	24.0933	59.89
243	West Bengal	Murshidabad	Lalbagh	88.2836	24.1708	266.54
244	West Bengal	Murshidabad	Lohadaha	88.1786	23.8850	23.09
245	West Bengal	Murshidabad	Mirzapur	88.0686	24.4083	106.91
246	West Bengal	Murshidabad	Nabipur TW	88.6050	24.2528	23.76
247	West Bengal	Murshidabad	Nasipur	88.3861	24.3069	154.68
248	West Bengal	Murshidabad	Nasipur	88.4125	24.0319	13.37
249	West Bengal	Murshidabad	Piprahali	88.4561	23.9839	41.74
250	West Bengal	Murshidabad	Purandarpur PZ	88.0733	23.9967	32.51
251	West Bengal	Murshidabad	Ramakantapur	88.0556	24.5536	84.31
252	West Bengal	Murshidabad	Ranjitpara	88.3139	24.1647	249.61
253	West Bengal	Murshidabad	Sagarpara	88.6997	24.2236	11.35
254	West Bengal	Murshidabad	Saktipur	88.1964	23.8619	138.72
255	West Bengal	Murshidabad	Swarupnagar	88.2775	23.9211	36.54
256	West Bengal	Murshidabad	Tartipur	88.4394	24.0933	65.28
257	West Bengal	Murshidabad	Tehghari-Rampura	88.1381	24.4506	61.44
258	West Bengal	N24 Parganas	Bagaband	88.5306	22.6689	16.78
259	West Bengal	N24 Parganas	Bagdah	88.8942	23.2111	49.66
260	West Bengal	N24 Parganas	Banipur	88.6353	22.8208	68.55
261	West Bengal	N24 Parganas	Berghoom	88.7083	22.8678	110.15
262	West Bengal	N24 Parganas	Bhandarkola	88.7044	23.0053	95.96
263	West Bengal	N24 Parganas	Boyra	88.9786	23.2114	13.52

S. No.	State	District	Site Name	Longitude	Latitude	Arsenic (µg/mL)
264	West Bengal	N24 Parganas	Chandipur	88.7925	22.8211	28.20
265	West Bengal	N24 Parganas	Chatra	88.7689	22.8392	28.48
266	West Bengal	N24 Parganas	Chauberia	88.6833	22.9764	50.84
267	West Bengal	N24 Parganas	Chowmoha	88.5494	22.6489	16.75
268	West Bengal	N24 Parganas	Gopalnagar	88.7753	23.0650	53.48
269	West Bengal	N24 Parganas	Habra	88.6658	22.8519	78.86
270	West Bengal	N24 Parganas	Jayantipur Bazar (Petrapole)	88.8736	23.0381	10.98
271	West Bengal	N24 Parganas	Kalupur Dakshinpara	88.8406	23.0158	68.88
272	West Bengal	N24 Parganas	Kansona	88.7489	23.0703	82.53
273	West Bengal	N24 Parganas	Krishnachandrapur	88.8181	23.1519	16.07
274	West Bengal	N24 Parganas	Kuliagarh	88.4592	22.8808	33.77
275	West Bengal	N24 Parganas	Nawapara	88.8464	22.5411	16.10
276	West Bengal	N24 Parganas	Rajapur	88.7342	22.9617	109.18
277	West Bengal	N24 Parganas	Rajarhat	88.4710	22.6362	11.92
278	West Bengal	N24 Parganas	Tentulia	88.7014	22.9003	13.55
279	West Bengal	N24 Parganas	Thakurnagar	88.7750	22.9278	174.76
280	West Bengal	Nadia	Banpur	88.7686	23.4553	10.12
281	West Bengal	Nadia	Bhatjangla	88.4853	23.3756	69.84
282	West Bengal	Nadia	Bishnupur	88.4175	23.3800	70.98
283	West Bengal	Nadia	Choko-Andulia M-II TW	88.5536	23.5231	48.45
284	West Bengal	Nadia	Chougacha-Kutirpara More	88.6675	23.4242	15.04
285	West Bengal	Nadia	Chukhali	88.5147	23.4250	20.82
286	West Bengal	Nadia	Dayer-Bazar	88.5444	23.4619	71.39
287	West Bengal	Nadia	Debnathpur M-II TW	88.5467	23.7739	82.78
288	West Bengal	Nadia	Duttaphulia	88.6914	23.2442	29.47
289	West Bengal	Nadia	Gobrapota (Dhakapara)	88.5392	23.4189	17.81
290	West Bengal	Nadia	Gournagar	88.4583	23.4994	11.62
291	West Bengal	Nadia	Harishnagar	88.7783	23.4742	46.14
292	West Bengal	Nadia	Jahangirpur Mark-II TW	88.4556	23.3900	30.06
293	West Bengal	Nadia	Kaliganj	88.2306	23.7308	117.12
294	West Bengal	Nadia	Mazdia	88.7197	23.4147	32.50
295	West Bengal	Nadia	Panikhali Bazar	88.6581	23.2336	26.87
296	West Bengal	Nadia	Paninala	88.5128	23.4317	45.90
297	West Bengal	South 24 Parganas	Bhojerhat	88.5800	22.4400	11.76
298	West Bengal	South 24 Parganas	Gobindapur	88.4125	22.3903	46.06
299	West Bengal	South 24 Parganas	Jotirampur Ferryghat	88.8000	22.1700	19.59

Annexure-VII**Locations Having Uranium >0.03 mg/litre (>30ppb) in Ground Water in Different States/UT of India (NHS 2019-20)**

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
1	Andhra Pradesh	Ananthapur	A Roppam-PZ	77.2736	14.0267	170.48
2	Andhra Pradesh	Ananthapur	Alampur	78.1639	14.1917	111.58
3	Andhra Pradesh	Ananthapur	Kambalaparthi-DW14	77.8833	14.1583	46.83
4	Andhra Pradesh	Ananthapur	Kundurpi-DW14	77.0500	14.3000	41.22
5	Andhra Pradesh	Ananthapur	Madakasira1	77.2417	13.9583	318.84
6	Andhra Pradesh	Ananthapur	Palasamudram	77.7314	13.9728	39.79
7	Andhra Pradesh	Ananthapur	RollaAqII-PZ	77.1039	13.8392	35.95
8	Andhra Pradesh	Ananthapur	Tanakallu-PZ	78.1986	13.9194	236.77
9	Andhra Pradesh	Chittoor	BalezapalliDW15	79.3808	13.5214	36.16
10	Andhra Pradesh	Chittoor	Basani Khonda-DW14	78.5292	13.5531	45.39
11	Andhra Pradesh	Chittoor	Chintaparti-1	78.7153	13.5042	594.59
12	Andhra Pradesh	Chittoor	Damalcheruvu	79.0472	13.4750	2875.97
13	Andhra Pradesh	Chittoor	Kanipakam-DW14	79.0603	13.2622	37.48
14	Andhra Pradesh	Chittoor	Mungilipattu	79.2333	13.5667	57.74
15	Andhra Pradesh	Chittoor	Pillarakuppam	79.3289	13.3092	31.79
16	Andhra Pradesh	Chittoor	Ramasamudram-DW15	78.4267	13.3667	217.59
17	Andhra Pradesh	East Godavari	Sanjeeva Reddy Palem	81.1492	17.6333	37.44
18	Andhra Pradesh	Guntur	Tadikonda-Dw	80.4522	16.4164	64.51
19	Andhra Pradesh	Kadapa	Chinnamandyam	78.7008	13.9456	42.30
20	Andhra Pradesh	Kadapa	DhodiumPZ	78.2200	14.9447	211.56
21	Andhra Pradesh	Kadapa	Galiveedu-alt	78.5000	14.0000	52.59
22	Andhra Pradesh	Kadapa	Sanipai	78.9500	14.1167	99.91
23	Andhra Pradesh	Krishna	Vissannapet New	80.8000	16.9500	50.57
24	Andhra Pradesh	Kurnool	Gulyam-DW13	77.1417	15.3667	125.00
25	Andhra Pradesh	Kurnool	Karivemula	77.6042	15.6167	78.07
26	Andhra Pradesh	Kurnool	Naganathanahalli	77.2333	15.5667	38.46
27	Andhra Pradesh	Prakasam	Santamaguluru	79.9167	16.1333	33.45
28	Bihar	Begusarai	Manjaul	86.1500	25.5600	32.48
29	Bihar	BHABUA	NUWAN	83.5400	25.2900	32.49
30	Bihar	Kishanganj	Bahadurganj B	87.8100	26.3000	57.47
31	Bihar	Madhepura	Abhiyatola, Basaitha	87.0500	25.5300	32.77
32	Bihar	Madhepura	Uda Kishanganj	86.9500	25.6800	31.39
33	Bihar	Nawada	Rupau	85.7600	24.8500	39.87
34	Bihar	Purnea	Kasba	87.5300	25.8500	32.14
35	Bihar	Purnea	Tikapati	87.2200	25.5300	30.99
36	Bihar	Siwan	Tarwara	84.4900	26.2000	34.39
37	Chattisgarh	Bilaspur	Adbhar	81.5915	22.4908	98.60
38	Chattisgarh	Bilaspur	DamDam	82.1392	22.8267	103.96
39	Chattisgarh	Bilaspur	Jaroundha	81.5644	22.1535	94.52
40	Chattisgarh	Jashpur	Durgapara	83.5496	23.0304	136.74
41	Chattisgarh	Jashpur	Kandora	83.9681	22.7558	39.98
42	Chattisgarh	Jashpur	Maini	83.5403	22.9806	138.18
43	Chattisgarh	Jashpur	Raikera(Kunkuri)	84.0250	22.7708	41.45
44	Chattisgarh	Kanker	Kanker	81.4958	20.2791	124.98
45	Chattisgarh	Korba	Chhuri	82.6186	22.4756	115.65

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
46	Chattisgarh	Korba	Gopalpur	82.6500	22.4347	112.29
47	Chattisgarh	Korba	Katghora	82.5208	22.5083	112.71
48	Chattisgarh	Korba	Nonbirra-4	82.8601	22.2699	124.20
49	Delhi	Delhi	Auchandi Pz	76.9972	28.8194	44.26
50	Delhi	Delhi	Kanjhawala Pz	77.0000	28.7250	31.32
51	Delhi	Delhi	Nizampur EW	76.9667	28.7194	89.39
52	Delhi	Delhi	Ojwah Pz	76.9142	28.5767	31.68
53	Delhi	Delhi	Peeragarhi DW	77.0933	28.6756	40.39
54	Delhi	Delhi	Rani Khera DW	77.0250	28.7069	60.42
55	Delhi	Delhi	Tikri Kalan	76.9694	28.6833	64.11
56	Gujarat	Ahmedabad	Barvala	71.8917	22.1500	56.73
57	Gujarat	Ahmedabad	Tagadi	71.9472	22.2958	31.85
58	Gujarat	Dohad	Garbara	74.3150	22.6849	42.52
59	Gujarat	Patan	Piprala	71.1053	23.6481	36.08
60	Gujarat	Vadodara	Bodeli	73.7167	22.2708	35.53
61	Haryana	Ambala	Jandheri	76.6103	30.0933	32.71
62	Haryana	Bhiwani	Badala	76.2542	28.7569	78.10
63	Haryana	Bhiwani	Dhanana	76.1681	28.9375	62.69
64	Haryana	Faridabad	Ballabhgarh	77.3350	28.3472	37.70
65	Haryana	Fatehabad	Aharwan	75.5417	29.6078	37.24
66	Haryana	Fatehabad	Badopal	75.5500	29.4458	36.06
67	Haryana	Fatehabad	Khajuri Jatti	75.6111	29.4756	40.81
68	Haryana	Fatehabad	Nangla	75.8875	29.6139	45.90
69	Haryana	Gurugram	Kasan	76.9083	28.3569	45.94
70	Haryana	Hissar	Balawas	75.8222	28.9583	31.20
71	Haryana	Hissar	Banbhauri	76.0500	29.4000	32.63
72	Haryana	Hissar	Barwala	75.9167	29.3867	40.93
73	Haryana	Hissar	Basra	75.5250	29.2167	37.19
74	Haryana	Hissar	Gianpura	76.0232	29.3497	54.07
75	Haryana	Hissar	Hissar	75.7222	29.1400	71.92
76	Haryana	Hissar	kanoh	75.7569	29.3728	33.34
77	Haryana	Hissar	Khanda Kheri	76.2333	29.2089	55.22
78	Haryana	Hissar	Kharar	75.8989	29.1217	45.78
79	Haryana	Hissar	Kherijalab	76.0833	29.3417	32.42
80	Haryana	Hissar	Moth Majra	76.0958	29.2083	42.68
81	Haryana	Hissar	Rajthal	76.1875	29.2583	56.77
82	Haryana	Hissar	Sohu	75.8333	29.4986	131.45
83	Haryana	Hissar	Uklana Mandi	75.8583	29.5083	47.36
84	Haryana	Jhajjar	Bagoa	76.4306	28.6722	44.55
85	Haryana	Jhajjar	Gabhana	76.8417	28.5708	44.28
86	Haryana	Jind	Alewa	76.4542	29.4708	33.88
87	Haryana	Jind	Baroda	76.1889	29.4389	42.98
88	Haryana	Jind	Bhuslana	76.7342	29.4214	63.34
89	Haryana	Jind	Dorana	76.4819	29.5186	34.23
90	Haryana	Jind	Julana	76.2719	29.4769	37.50
91	Haryana	Jind	khatkaran	76.2458	29.4056	40.24
92	Haryana	Jind	Korar	76.0417	29.7292	32.21
93	Haryana	Jind	Lochap	76.4222	29.3583	39.46
94	Haryana	Jind	Rojhala	29.3644	29.3644	34.74
95	Haryana	Jind	Uchana	76.1861	29.4694	136.67
96	Haryana	Kaithal	Balhera	76.6614	29.8472	50.92
97	Haryana	Kaithal	Jajanpur	76.6066	29.9050	31.15
98	Haryana	Kaithal	Khanpur	76.3722	29.8514	37.11
99	Haryana	Kaithal	Manaspatti	76.3292	29.8292	38.53
100	Haryana	Kaithal	Mataur	76.2583	29.6083	56.90

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
101	Haryana	Kaithal	Padla	76.3000	30.1000	36.38
102	Haryana	Kaithal	Rasulpur Ghamri	76.2606	29.9142	37.88
103	Haryana	Kaithal	Siwan	76.3539	29.8833	31.61
104	Haryana	Kaithal	Titiana	76.3297	30.0897	54.42
105	Haryana	Karnal	Gangateri	76.5039	29.4778	37.92
106	Haryana	Karnal	Mound	76.5472	29.5181	40.78
107	Haryana	Kurukshetra	Bodhni	76.5583	30.0542	33.51
108	Haryana	Kurukshetra	Thana	76.5014	29.9200	33.58
109	Haryana	Mahendergarh	Narnaul	76.1125	28.0500	56.06
110	Haryana	Palwal	Bamnikhhera	77.3417	28.0625	48.14
111	Haryana	Palwal	Jaindapur	77.2389	28.2042	45.18
112	Haryana	Palwal	Jawan	77.4167	28.2278	31.26
113	Haryana	Palwal	Lakhnaka	77.1875	28.0347	32.35
114	Haryana	Palwal	Rasulpur	77.3983	28.0867	58.72
115	Haryana	Panipat	Etola	76.7417	29.3472	53.79
116	Haryana	Panipat	Israna	76.8500	29.2778	67.63
117	Haryana	Panipat	Khalila Manjran	76.7744	29.2944	35.19
118	Haryana	Panipat	Lohari	76.8389	29.3583	82.64
119	Haryana	Panipat	Nimbri	77.0361	29.3806	44.51
120	Haryana	Panipat	pugthala	76.8875	29.1675	47.38
121	Haryana	Panipat	Untala	76.8490	29.3940	32.92
122	Haryana	Panipat	Urlana Kalan	76.6792	29.3417	32.09
123	Haryana	Rohtak	Kansla	76.7750	28.8917	60.73
124	Haryana	Rohtak	Maham	76.3000	28.9633	72.42
125	Haryana	Sirsa	Bhuratwala	74.7708	29.4250	94.21
126	Haryana	Sirsa	Chormar	74.8417	29.7833	154.16
127	Haryana	Sirsa	Chotala	74.5167	29.7750	48.76
128	Haryana	Sirsa	Goriwala	74.7083	29.7917	36.42
129	Haryana	Sirsa	Kalanwali Mandi	74.9889	29.8389	300.80
130	Haryana	Sirsa	Khuiyan Malkana	74.7694	29.8583	48.78
131	Haryana	Sirsa	Mammer Khera	74.6569	29.6722	43.97
132	Haryana	Sirsa	Mangala	74.9556	29.4778	32.24
133	Haryana	Sirsa	Masitan	74.7200	29.8861	56.73
134	Haryana	Sirsa	Mithri	74.9833	29.8500	103.47
135	Haryana	Sirsa	Nuhian Wali	74.8500	29.7542	83.68
136	Haryana	Sirsa	Odhan	74.8972	29.7667	145.06
137	Haryana	Sirsa	Phaggu	75.0222	29.6222	63.42
138	Haryana	Sirsa	Rasalia Khera	74.7667	29.7167	67.93
139	Haryana	Sirsa	Shergarh	74.6764	29.9264	35.49
140	Haryana	Sirsa	Sherpura	75.2042	29.4542	90.74
141	Haryana	Sirsa	Sirsa	75.0494	29.5358	42.10
142	Haryana	Sirsa	Sri Jiwan Naga	74.7417	29.5375	75.43
143	Haryana	Sirsa	Tejakhera	74.5556	29.8444	57.58
144	Haryana	Sonipat	Khanpur kalan	76.8278	29.1597	34.17
145	Haryana	Sonipat	Rohat	76.9750	28.9333	32.40
146	Haryana	Yamuna Nagar	Umari	77.2979	30.1647	39.75
147	Himachal Pradesh	Mandi	Lohara	76.9451	31.5886	70.69
148	Jharkhand	Godda	Godda	87.1400	24.5000	36.33
149	Jharkhand	Koderma	Koderma	85.3500	24.2700	59.55
150	Jharkhand	Koderma	Koderma	86.3600	24.2800	69.89
151	Jharkhand	Koderma	Tilaya	85.5168	24.4169	51.81
152	Jharkhand	Latehar	Garu	84.2417	23.6750	42.64
153	Jharkhand	Palamu	Lesliganj	84.1300	24.0200	34.52

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
154	Karnataka	Bangalore Rural	Avathi	77.7750	13.3417	111.85
155	Karnataka	Bangalore Rural	Kodagurki A	77.7003	13.2997	39.47
156	Karnataka	Bangalore Urban	Gollahalli	77.5656	12.8631	104.03
157	Karnataka	Bellary	Jogikallu	76.4458	14.9728	150.64
158	Karnataka	Bellary	Kakkuppi	76.4469	14.8661	42.14
159	Karnataka	Bellary	Venkatapura	76.5164	15.3308	54.74
160	Karnataka	Gulbarga	Chitapur A	77.0697	17.1167	34.21
161	Karnataka	Kolar	Angondanahalli	78.3508	13.0700	73.58
162	Karnataka	Kolar	Chintamani A	78.0553	13.4056	201.01
163	Karnataka	Mandya	Tirumala Sagara Chatra	76.6669	12.5486	40.39
164	Karnataka	Raichur	Bomanhal	76.3344	16.0722	54.63
165	Karnataka	Raichur	Hanchihal	76.6681	15.2394	35.66
166	Karnataka	Tumkur	Badavanahalli(A)	77.0667	13.6667	145.78
167	Madhya Pradesh	Betul	Betul1	75.8490	23.3450	108.13
168	Madhya Pradesh	Betul	Khedi	81.5460	23.6670	39.40
169	Madhya Pradesh	Chhatarpur	Gulganj	74.7610	23.0890	47.45
170	Madhya Pradesh	Chhatarpur	Kurri	75.2830	23.4260	39.24
171	Madhya Pradesh	Datia	Bhander	80.3520	21.9300	32.87
172	Madhya Pradesh	Datia	Datia	77.6990	21.5140	96.72
173	Madhya Pradesh	Datia	Imaliya	79.9910	23.1070	51.90
174	Madhya Pradesh	Gwalior	Ghantigaon	80.1440	22.6380	233.91
175	Madhya Pradesh	Gwalior	Tekanpur	78.5810	25.6940	58.50
176	Madhya Pradesh	Jhabua	Thandla1	74.8750	22.1340	75.00
177	Madhya Pradesh	Panna	Kuankheda	78.1000	25.3200	37.08
178	Madhya Pradesh	Raisen	Maindwa	75.9460	22.6760	51.32
179	Madhya Pradesh	Seoni	Dhangada	76.9380	23.3180	203.30
180	Madhya Pradesh	Seoni	Khawasa	76.9810	22.4840	61.39
181	Madhya Pradesh	Shivpuri	Dhola	78.1300	25.2830	79.07
182	Maharashtra	Bhandara	Khair Langi	79.7844	21.4092	47.98
183	Maharashtra	Gondia	Dhabetekdi	79.9647	20.7900	31.95
184	Maharashtra	Nagpur	Tarsha	79.3811	21.2258	33.44
185	Odisha	Angul	Kukurang	85.1483	20.8972	36.00
186	Odisha	Dhenkanal	Kandarsingha	85.3167	20.8667	38.00
187	Odisha	Sambalpur	Gosala	83.8994	21.4258	59.00
188	Odisha	Sundargarh	Alikera	84.0181	22.1931	38.00
189	Punjab	Bathinda	Ablu	74.7897	30.3389	67.99
190	Punjab	Bathinda	Badiala	75.3478	30.2350	41.51
191	Punjab	Bathinda	Baluanga	74.7839	30.2238	44.45
192	Punjab	Bathinda	Dera Tappa	74.9361	30.2583	82.51
193	Punjab	Bathinda	Ghudda	74.7889	30.1278	33.06
194	Punjab	Bathinda	Nahian wala	74.9097	30.3056	70.97
195	Punjab	Bathinda	Raike kalan	74.6681	30.1306	31.39
196	Punjab	Bathinda	Rampur phul	75.2353	30.2519	42.85
197	Punjab	Faridkot	Deep singh wala	74.4792	30.7389	38.18
198	Punjab	Faridkot	Jand Sahib	74.5272	30.6897	31.17
199	Punjab	Faridkot	Karirwali	74.8278	30.4056	36.12
200	Punjab	Faridkot	Matta	74.8383	30.4811	32.95
201	Punjab	Faridkot	Sadiq	74.5903	30.7069	38.99
202	Punjab	Faridkot	Sher singh wala	74.6231	30.6706	37.12
203	Punjab	Fatehgarh Sahib	Badli Ala singh	76.5167	30.6417	71.97

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
204	Punjab	Fatehgarh Sahib	Bassi Pathana	76.3778	30.7125	51.76
205	Punjab	Fatehgarh Sahib	Bhagrana	76.5778	30.6111	36.22
206	Punjab	Fatehgarh Sahib	Chunni Kalan	76.4936	30.7153	42.62
207	Punjab	Fatehgarh Sahib	Fatehgarh Sahib	76.4000	30.6500	41.00
208	Punjab	Fatehgarh Sahib	Innayatpur	76.3900	30.6478	46.05
209	Punjab	Fatehgarh Sahib	Nalini	76.4250	30.5000	33.16
210	Punjab	Fazilka	Abohar	74.1917	30.1478	33.64
211	Punjab	Fazilka	Bazidpur bhoma	74.3833	29.9583	69.47
212	Punjab	Fazilka	Khlilian Serovar	74.0778	30.1128	36.61
213	Punjab	Fazilka	Khundal	74.2692	30.2153	156.47
214	Punjab	Hoshiarpur	Bhangala	75.6086	32.0253	37.31
215	Punjab	Hoshiarpur	Chak Sheru	75.6244	32.0511	97.14
216	Punjab	Hoshiarpur	Chohal	75.9722	31.6111	31.12
217	Punjab	Hoshiarpur	Dagan	75.7150	31.9514	49.84
218	Punjab	Hoshiarpur	Dulmiwal	75.7514	31.8319	135.19
219	Punjab	Hoshiarpur	Garhdiwala	75.7417	31.7500	50.26
220	Punjab	Hoshiarpur	Haler Rampur	75.7894	31.8633	64.56
221	Punjab	Hoshiarpur	Nangal Bhiala	75.7083	31.9083	34.98
222	Punjab	Hoshiarpur	Pankhuh	75.6875	32.0208	39.95
223	Punjab	Hoshiarpur	Rampur Camp colony	75.9472	31.5028	58.99
224	Punjab	Hoshiarpur	Sham Chaurassi	75.7486	31.5014	71.92
225	Punjab	Hoshiarpur	Talwara	75.9000	31.9417	84.04
226	Punjab	Jalandhar	Jalandhar	75.5889	31.3250	52.77
227	Punjab	Jalandhar	Nakodar	75.4850	31.1333	140.41
228	Punjab	Jalandhar	Sarih	75.6003	31.1167	49.92
229	Punjab	Jalandhar	Shahkot	75.3303	31.0794	39.49
230	Punjab	Kapurthala	Dalla	75.2422	31.1744	36.10
231	Punjab	Kapurthala	Kapurthala	75.3806	31.3694	35.36
232	Punjab	Kapurthala	Phagwara	75.7792	31.2292	33.33
233	Punjab	Ludhiana	Chatar singh Park	75.7917	30.9000	64.52
234	Punjab	Ludhiana	Gopalpura	75.8417	30.7375	41.99
235	Punjab	Ludhiana	Halwara	75.6375	30.7250	34.83
236	Punjab	Ludhiana	Jagraon	75.4708	30.7750	150.40
237	Punjab	Ludhiana	Maksudra	76.0100	30.7300	79.68
238	Punjab	Ludhiana	Mangat	75.9125	30.9806	92.41
239	Punjab	Ludhiana	Pau Ludhiana	75.8111	30.9028	76.08
240	Punjab	Moga	Bajeke	75.1506	31.0000	31.09
241	Punjab	Moga	Chogawan	75.2689	30.8358	39.93
242	Punjab	Muktsar	Balochkhara,	74.5222	30.3681	41.54
243	Punjab	Muktsar	Lubnaian wali	74.5458	30.5861	31.50
244	Punjab	Pathankot	Parmota	75.7531	32.3475	44.27
245	Punjab	Patiala	Behmana	76.1347	30.1789	31.32
246	Punjab	Patiala	Kami Kalan	76.6792	30.3778	44.16
247	Punjab	Patiala	Lacharu kalan	76.6417	30.3450	51.05
248	Punjab	Patiala	Majhi	76.1005	30.2929	52.74
249	Punjab	Patiala	Mardan heri	76.2054	30.0563	66.94
250	Punjab	Ropar	Bara Chauta	76.4625	30.9278	42.88
251	Punjab	Ropar	Dumewal	76.4167	31.2083	44.06
252	Punjab	Sangrur	Bhulan	76.0097	29.7625	31.16
253	Punjab	Sangrur	Maler Kotla	75.9000	30.5250	44.27

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
254	Punjab	Sangrur	Sunam	75.8147	30.1233	37.08
255	Punjab	SAS Nagar	Chhat	76.7961	30.6142	39.62
256	Punjab	SAS Nagar	Dheri	76.6958	30.6250	55.14
257	Punjab	SAS Nagar	Goga	76.5542	30.7083	56.62
258	Punjab	SAS Nagar	Issapur	76.8308	30.5917	54.03
259	Punjab	SAS Nagar	Landran	76.6611	30.6939	51.89
260	Rajasthan	Ajmer	Kanpura1	74.8667	26.4000	63.42
261	Rajasthan	Ajmer	Nai Khera	75.1800	25.9400	33.49
262	Rajasthan	Ajmer	Tabiji	74.6200	26.3600	33.12
263	Rajasthan	Alwar	Ramgarh1	76.8136	27.5936	34.93
264	Rajasthan	Banswara	Chota Dungra	74.2900	23.1700	34.05
265	Rajasthan	Barmer	Arniyali	71.9675	25.4667	34.45
266	Rajasthan	Barmer	Panavada	71.7569	25.9939	33.54
267	Rajasthan	Bhilwara	Gulabpura	74.6700	25.9000	46.99
268	Rajasthan	Bhilwara	Mandalgarh1	75.0900	25.1800	64.85
269	Rajasthan	Bikaner	Arjansar	73.8800	28.9300	41.85
270	Rajasthan	Bikaner	Chhatargarh	73.1333	28.6667	34.35
271	Rajasthan	Bikaner	Kaloo	73.8700	28.3700	35.88
272	Rajasthan	Bundi	Ballop	75.7500	25.2667	57.50
273	Rajasthan	Chittaurgarh	Purohitokasavat	74.5200	24.9400	46.62
274	Rajasthan	Churu	Bhojasar	74.5400	27.9700	33.29
275	Rajasthan	Churu	Rajgarh1	75.3750	28.6333	45.42
276	Rajasthan	Churu	Soniasar	74.0200	27.7700	32.35
277	Rajasthan	Dausa	Jasuta	76.3300	26.9700	36.13
278	Rajasthan	Ganganagar	Kheruwala	74.2400	29.8500	42.05
279	Rajasthan	Ganganagar	Piperan	73.9000	29.2483	45.77
280	Rajasthan	Ganganagar	Rupanagar	73.4500	29.8000	33.50
281	Rajasthan	Jaipur	Bhojpura	75.6136	26.6222	66.61
282	Rajasthan	Jaipur	Choru	75.4500	26.5900	31.21
283	Rajasthan	Jaipur	Goner	75.8994	26.7556	52.16
284	Rajasthan	Jaipur	Majhi Renwal	75.6800	26.7000	95.53
285	Rajasthan	Jaipur	Mozmabad	75.3600	26.6800	50.94
286	Rajasthan	Jaipur	Nasnota	75.4400	26.8000	79.98
287	Rajasthan	Jaipur	Shivdasapura	75.8900	26.7100	138.42
288	Rajasthan	Jaipur	Tootoli	75.8000	26.6300	43.14
289	Rajasthan	Jalore	Bhinmal1	72.2625	25.0125	35.90
290	Rajasthan	Jodhpur	Khudala	72.8300	26.1500	40.33
291	Rajasthan	Jodhpur	Ramrawas	73.3800	26.3700	43.18
292	Rajasthan	Karauli	Bhauapura	77.1800	26.5400	56.34
293	Rajasthan	Nagaur	Bagot	74.5830	26.8170	181.08
294	Rajasthan	Nagaur	Singhana1	74.5100	27.4800	44.18
295	Rajasthan	Nagaur	Singhana1	74.5125	27.4753	53.02
296	Rajasthan	Pratapgarh	Suhagpura	74.7100	23.9100	45.56
297	Rajasthan	Rajsamand	Chattarpur	73.9561	25.2414	108.67
298	Rajasthan	Rajsamand	Gugli	73.8800	25.2300	37.41
299	Rajasthan	Rajsamand	Khandel 1	74.0800	25.1200	33.13
300	Rajasthan	Rajsamand	Oda 1	74.0000	25.0300	56.02
301	Rajasthan	Sawai Madhopur	Bonali	76.2542	26.3542	33.17
302	Rajasthan	Tonk	Arniyalmal	75.8100	26.0600	59.48
303	Rajasthan	Tonk	Dikoliya	75.9700	25.9800	38.05
304	Rajasthan	Tonk	Niwai1	75.9333	26.3667	37.07
305	Rajasthan	Udaipur	Mavli1	73.9833	24.7833	38.70
306	Tamil Nadu	Dindigul	Senarpatti	78.0708	10.2814	53.92
307	Tamil Nadu	Dindigul	Vaivespuram	78.0719	10.5458	113.38

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
308	Tamil Nadu	Erode	Erakalpudur (Sivanmalai)	77.5348	11.0311	49.70
309	Tamil Nadu	Erode	Kolappalur	77.4272	11.3800	88.93
310	Tamil Nadu	Krishnagiri	Anusonai	77.9000	12.5667	32.55
311	Tamil Nadu	Krishnagiri	Bargur	78.3583	12.5458	45.04
312	Tamil Nadu	Krishnagiri	Machinayampalli	77.7844	12.6156	57.99
313	Tamil Nadu	Krishnagiri	Megalachinnappalli pz	78.2542	12.6250	302.29
314	Tamil Nadu	Krishnagiri	Thally	77.6583	12.5792	39.47
315	Tamil Nadu	Madurai	Thirupallai	78.1389	9.9833	103.99
316	Tamil Nadu	Namakkal	Elachipalayam	78.0125	11.3847	61.77
317	Tamil Nadu	Namakkal	Unjanai	77.9561	11.3531	174.84
318	Tamil Nadu	Namakkal	Uthandipalayam	77.9394	11.4219	134.94
319	Tamil Nadu	Ramanathapuram	Tiruvadanai1	78.9208	9.7833	70.19
320	Tamil Nadu	Salem	Chittoor pz	77.8250	11.6442	67.71
321	Tamil Nadu	Thiruvannamalai	Kancheepuram	79.4230	12.5000	61.27
322	Tamil Nadu	Tirupur	Uthukadu	77.2004	11.0643	42.09
323	Tamil Nadu	Tiruvallur	Agoor(S)	79.5800	13.1900	47.12
324	Tamil Nadu	Tiruvallur	Madam(S)	79.6100	13.1700	160.06
325	Telangana	Adilabad	Sonari-Alt	77.9117	19.2011	58.51
326	Telangana	Hyderabad	Koti-PZ	78.4861	17.3861	158.24
327	Telangana	Mahabubnagar	Amrabad-PZ	78.8200	16.3747	45.09
328	Telangana	Mahabubnagar	Balanagar 2012Pz	78.1781	16.9447	46.94
329	Telangana	Mahabubnagar	Gundimal	77.7000	16.8978	53.53
330	Telangana	Mahabubnagar	Jadcharla 2012Pz	78.1450	16.7478	41.70
331	Telangana	Mahabubnagar	Jananpet-Pz	77.9894	16.6467	41.59
332	Telangana	Mahabubnagar	Kandur-Pz	77.9600	16.5569	58.27
333	Telangana	Mahabubnagar	Kothur 2012Pz	78.2744	17.1356	34.26
334	Telangana	Mahabubnagar	Lingal-PZ	78.5639	16.2956	85.74
335	Telangana	Mahabubnagar	Manganur-PZ	78.1553	16.5822	68.68
336	Telangana	Mahabubnagar	Nagarkurnool-PZ	78.5275	16.8822	49.63
337	Telangana	Mahabubnagar	Narsaiahpally-Pz	78.2433	16.1814	61.63
338	Telangana	Mahabubnagar	Pedda Dagada-PZ	78.1647	16.0503	134.37
339	Telangana	Mahabubnagar	Polkampalli-PZ	78.5639	16.5781	53.36
340	Telangana	Mahabubnagar	PonnakelPz	77.9411	16.5667	48.97
341	Telangana	Mahabubnagar	Ravalpalle	77.5022	17.0903	38.11
342	Telangana	Mahabubnagar	Timmajipet 2012Pz	78.1928	16.6706	39.86
343	Telangana	Mahabubnagar	Vanaparathi-PZ	78.0697	16.3667	44.18
344	Telangana	Mahabubnagar	Vangur-PZ	78.5000	16.6000	51.29
345	Telangana	Mahabubnagar	Velgonda-PZ	78.1047	16.0847	39.50
346	Telangana	Medak	Bodagutta	77.9708	18.0528	34.52
347	Telangana	Medak	Kaudipally-PZ	78.2083	17.8958	36.99
348	Telangana	Medak	Medak IMD-Pz	78.2739	18.0528	37.91
349	Telangana	Medak	Nizampet	77.8861	18.0111	34.98
350	Telangana	Medak	Reddypalli-PZ	78.2586	17.7800	38.48
351	Telangana	Medak	Yusuf Peta-DW13	78.1361	18.0475	61.36
352	Telangana	Nalgonda	Antampet-PZ1	78.8889	17.0361	61.99
353	Telangana	Nalgonda	G.palli(dindi) -PZ	78.7083	16.5403	39.93
354	Telangana	Nalgonda	Nagaram Aq-I	79.0200	17.3569	82.21
355	Telangana	Nalgonda	Panthangi-PZ1	78.9556	17.2431	59.99
356	Telangana	Nalgonda	Penpahad-PZ	79.6528	17.0083	36.65
357	Telangana	Ranga Reddy	Nancherla 2011Pz	77.8506	16.9067	65.91
358	Uttar Pradesh	Aligarh	Dhanipur	78.1838	27.9249	41.28
359	Uttar Pradesh	Aligarh	Gonda	77.8461	27.8005	53.37
360	Uttar Pradesh	Azamgarh	jahanaganj	83.2674	25.9588	32.43

S. No.	State	District	Site Name	Longitude	Latitude	Uranium (µg/mL)
361	Uttar Pradesh	Bijnor	Kiratpur	78.2696	29.4966	34.08
362	Uttar Pradesh	Bijnor	Mohammadpur	78.1149	29.4744	188.89
363	Uttar Pradesh	Budaun	BISOULI	78.9414	28.3210	47.63
364	Uttar Pradesh	Budaun	MIAON	79.2639	27.9020	61.99
365	Uttar Pradesh	Budaun	WAJIRGANJ	79.2145	27.8200	36.77
366	Uttar Pradesh	Bulandshahar	Shikarpur	78.0042	28.2789	50.67
367	Uttar Pradesh	Deoria	Bhaluwani	83.7608	26.3711	51.11
368	Uttar Pradesh	Farrukhabad	RAJEPUR	79.6629	27.4801	33.72
369	Uttar Pradesh	Fatehpur	Malwan	80.7100	26.0390	43.23
370	Uttar Pradesh	Gautam Buddha Nagar	Dankaur	77.5556	28.3522	35.05
371	Uttar Pradesh	Gautam Buddha Nagar	Jewar	77.5667	28.1244	39.40
372	Uttar Pradesh	Ghaziabad	Dholana	77.6986	28.5961	42.29
373	Uttar Pradesh	Ghazipur	jakhaniya	83.3724	25.7421	36.93
374	Uttar Pradesh	Hardoi	Mallawan	80.1950	27.0220	32.70
375	Uttar Pradesh	Hathras	Sasni	78.0744	27.6911	52.80
376	Uttar Pradesh	J P Nagar	Joya	78.5235	28.8512	59.49
377	Uttar Pradesh	Kanpur Nagar	Chaubepur	80.2236	26.6211	31.89
378	Uttar Pradesh	Mainpuri	KISHNI	79.2664	27.0316	42.37
379	Uttar Pradesh	Mathura	Chhata	77.5143	27.7113	71.05
380	Uttar Pradesh	Mathura	Goverdhan	77.4725	27.4922	31.23
381	Uttar Pradesh	Mathura	Nandgaon	77.3850	27.7158	39.94
382	Uttar Pradesh	Mathura	Raya	77.7886	27.5531	44.89
383	Uttar Pradesh	Pratapgarh	Baba Bekhernath	81.9442	25.8997	31.90
384	Uttar Pradesh	Pratapgarh	Babaganj	81.5822	25.7992	31.97
385	Uttar Pradesh	Pratapgarh	Sangaipur	81.8665	25.9458	53.69
386	Uttar Pradesh	Rae Bareili	Chhatoh	81.3254	26.4586	55.50
387	Uttar Pradesh	Rae Bareili	Lalganj	80.9138	26.1305	37.98
388	Uttar Pradesh	Sultanpur	Jagdishpur	81.6124	26.4483	31.24
389	Uttar Pradesh	Sultanpur	P.P Kannaicha	82.0117	26.3597	32.68
390	Uttar Pradesh	Unnao	Nawabganj	80.6753	26.6208	35.14
391	Uttar Pradesh	Unnao	Unchahar	80.8654	26.5475	45.47
392	West Bengal	Malda	Malda Town	88.1355	25.0029	34.26



Central Ground Water Board
Dept of WR, RD & GR
Ministry of Jal Shakti
Govt of India

NAQUIM 2.0 toolkit

- a set of operational guidelines for carrying out NAQUIM 2.0 studies

Version Beta

April, 2023
Faridabad

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NAQUIM 2.0 toolkit

1. Introduction

NAQUIM

The Aquifer Mapping and Management programme (NAQUIM) was launched by CGWB in the year 2012 as per the recommendations of the Report of the Steering Committee on Water Resources and Sanitation for Twelfth Five Year Plan (2012-2017), Planning Commission. NAQUIM was taken up with the objectives of delineating aquifers, characterizing aquifers and preparing aquifer management plans. National level mapping of Aquifers on 1:50,000 scale was considered sufficient for planning requirements up to block level. Some of the important uses of Aquifer mapping at 1:50,000 scale include identification of suitable areas for ground water based supply to large urban agglomerations, determine sustainability of groundwater development, identification of aquifers capable of providing water supply during protracted drought periods, prioritization of aquifers for managed aquifer recharge, identification of aquifers and determination of their suitability for various purposes in regions where new urban centres or industrial hubs are likely to come up in future, planning of integrated ground water recharge schemes, issuing advisories to the state agencies on repercussions of continued development of groundwater in select areas, recommendations to state agencies in respect of areas that have prospects for ground water development etc. Many states/UTs are using the information for planning management interventions at the block level. Out of ~33 Lakh km² of the entire country, a mappable area of ~25 Lakh km² was identified to be covered under this programme. The entire targeted area has been covered by 2022-23.

The findings of NAQUIM studies are being utilized by many agencies, especially the State government agencies involved in ground water management and water supply. Major areas where NAQUIM outputs have been used include

- Drinking water source finding and source sustainability
- Sites for Artificial Recharge
- Safe Drinking water sources in Arsenic affected areas
- Assured irrigation through ground water in areas that have adequate ground water potential.
- Implementation of water conservation and AR schemes
- Ground Water Regulation based on NAQUIM recommendation
- Rejuvenation of Hot springs
- Atal Bhujal Yojana – Participatory Ground Water Management

NAQUIM 2.0

Though the NAQUIM outputs have been useful for sustainable ground water management in numerous ways as enumerated above, large scale implementation of its recommendations at ground level by the user agencies has been lacking. As per the feedback received from the agencies using the NAQUIM outputs, major limitations of the ongoing studies include i) non-availability of printed maps at usable scales and ii) lack of site specific recommendations for implementation at Panchayat or village level.

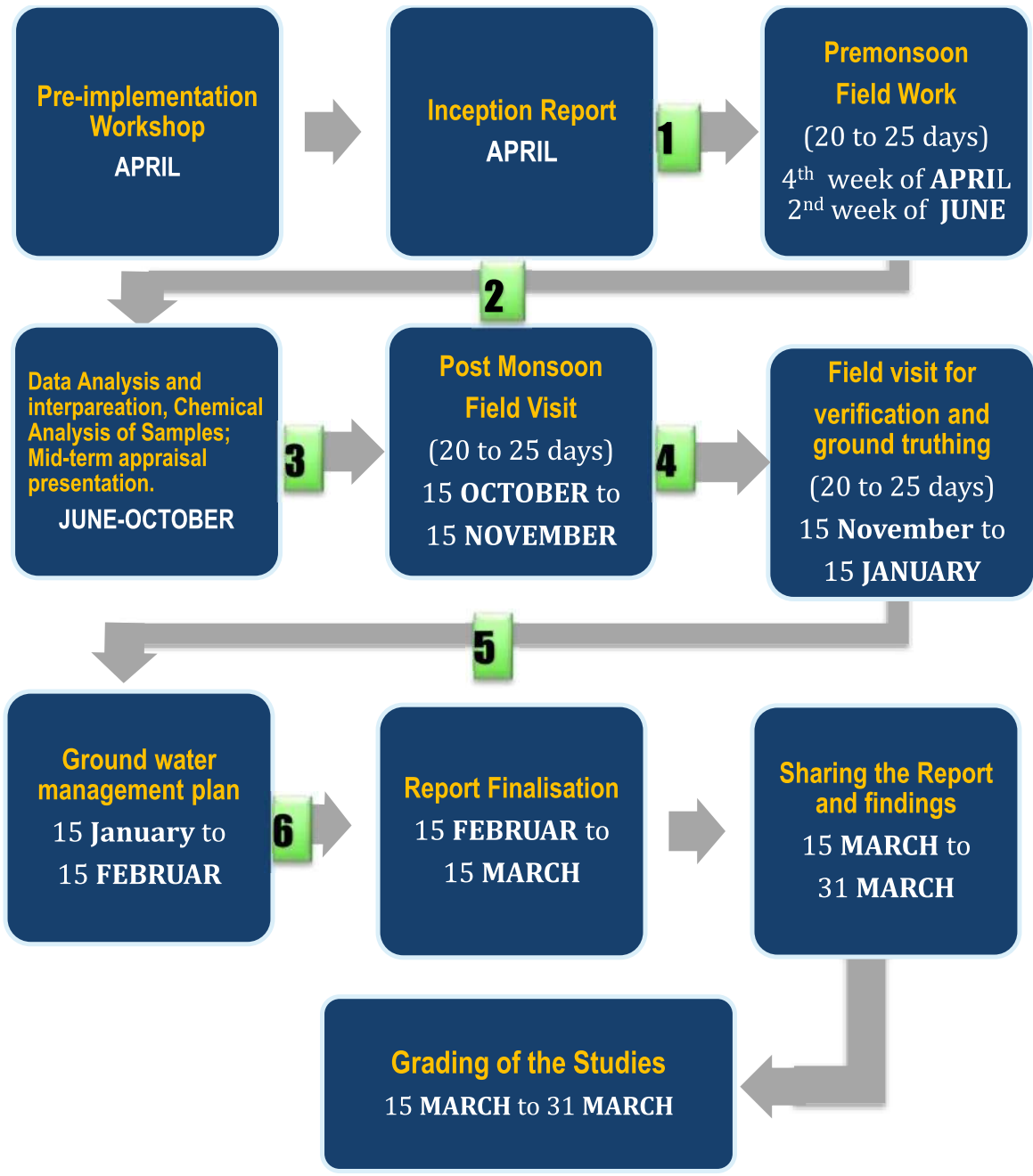
Keeping the above limitations in mind and considering the future requirements, broad objectives of NAQUIM 2.0 studies will be i) providing information in higher granularity with a focus on increasing density of dynamic data like ground water level, ground water quality etc. ii) providing issue based scientific inputs for ground water management upto Panchayat level, iii) providing printed maps to the users and iv) putting in place a strategy to ensure implementation of the recommended strategies. Involving state agencies in the studies for a sense of ownership

The Toolkit

This toolkit consists of a set of operational guidelines for the officers involved in planning and execution of NAQUIM 2.0 studies. The toolkit has been prepared after discussions with experts from various fields. The toolkit is meant to be used by trained professionals only. Detailed descriptions and exhaustive procedures are out of the purview of this document. It is expected that the professionals will use the toolkit in its true spirit.

While utmost care has been taken to provide a set of clear-cut guidelines, there is scope for improvement. The officers involved in the NAQUIM 2.0 are encouraged to use their expert judgement based on local hydrogeological knowledge. The officers involved in the studies are encouraged to carry out new analyses and follow newer approaches to achieve the goal. Feedback of the team members involved in NAQUIM studies are invaluable and are welcome to improve the toolkit.

2. Calendar of Activities and Milestones



Stages of Review			
1	Inception report	4	Post monsoon Field work
2	Pre monsoon Field Work	5	Ground Water Management Plan
3	Mid-term Review	6	Report Writing

3. Roles and Responsibilities

The NAQUIM 2.0 studies are envisaged to be multidisciplinary. Thus, it is proposed to have a team of experts in place for carrying out the activities proposed. Each team taking up the studies will have the following composition .:

Role	Responsibilities	Indicative Designation
Team Lead	- Planning, Supervision and Execution of the Project - Work distribution and monitoring of activities of other team members - Preparation of the inception report. - Timely Delivery of the envisaged Outputs - Finalisation of the management plan - Presentations at different forums, sharing of the outputs. - Preparation of the draft report as per the approved Quality Standards and its Final Submission. - Other members of the team will assist the team lead. - Please refer the table on priority area wise deliverables and outputs for further details	Hydrogeologist
Expert (Hydrogeology)-1	- Field Data Collection (Exploration, Pz construction, Water Level, Water Quality, Pumping Tests, Infiltration tests, demand/supply data, sample surveys and others) - Sample collection for quality studies - Secondary Data collection - Entering data in database (WIMS)	Hydrogeologist
Expert (Hydrogeology)-2	- Integration of data, preparation of thematic maps, preparation cross sections etc. - Consultation with allied experts like agriculture, irrigation, agro-economics etc. - Preparation of Management Plan - Assisting the Team Lead in preparing maps and reports. - All Officers should work in GIS and try to prepare maps on their own. - Please refer the table on priority area wise deliverables and outputs for further details	Hydrogeologist
Expert (Geophysics)	- Field Geophysical Surveys - Interpretation of field data - Entering data in database (WIMS) - Integration with existing geophysical and lithology data - Preparation of inferred lithologs - Suggesting potential sites for construction of water wells/artificial recharge - Preparation of Tables, graphs and maps for reports - Assisting the Team Lead in preparing the Report - Please refer the table on priority area wise deliverables and outputs for further details	Geophysicist
Expert (Hydro chemistry)	- Sample collection for quality studies - Analysis of samples. - Integration with existing data - Validation and interpretation of data - Entering data in database (WIMS) - Preparation of Tables, graphs and maps for reports - Assisting the Team Lead in preparing the reports - Please refer the table on priority area wise deliverables and outputs for further details	Chemist

4. Prioritisation of Areas

NAQUIM 2.0 is designed to provide detailed information to support groundwater management decisions at ground level. Since the issues are different in different areas, the studies under NAQUIM 2.0 are proposed as issue specific and will be undertaken in prioritized focus areas. Broadly 11 Priority areas are identified based on ground water related issues as given below.

1: Water Stressed Areas; **2:** Urban Agglomerate; **3:** Coastal Areas; **4:** Industrial Clusters and Mining Areas; **5:** Areas with Springs as the principal source; **6:** Areas with Deeper Aquifers; **7:** Ground Water Contamination; **8:** Autoflow zones; **9:** Canal Command Areas, **10:** Areas with poor ground water quality, **11:** Other specific Issues

5. Work Plan and timelines

Period	Assignments to be carried out
1 st to 3 rd week of April	Base map Preparation: - Area map showing communication network, drainage, important places, existing NHS, existing EW, OW, Pz & DW, Data generated during previous NAQUIM studies and proposed locations for establishment of key wells - The RF (Reduction Factor or Representative Fraction) of the admin basemap should be 1:10,000 or more. Preparation of the Inception Report: - Please see the format for details.
I st Review	Review of Inception report
4 th week of April 2 nd week of June (20-25 days fieldwork)	Field Data Collection - Key well/spring establishment; Water level/spring discharge measurement including geo-coded locations (if not done earlier). & Water sample collection - Density of one key well per 5 - 10 Km², collect aquifer wise data wherever possible. Rigorous monitoring of deeper aquifer is necessary if they are commonly being used for agriculture & Industrial purposes. If they are less frequently used, coarser sampling and monitoring is considered sufficient. - Specific studies -Infiltration, Slug test, Pumping test - Apprising Block level Authorities about the Work Item. Presentation of Inception Report. Sample Surveys and User Feedback: - Discussions with farmers and other users at ground level. Collection of information from local agencies or well owners about well depth, slotted zone/fracture zone, discharge (can be measured by the officer, if possible), static water level and random drawdown data, Irrigation Practices, cropping pattern and related information. - Instantaneous discharge measurements along with data on, pump working hour for estimating unit draft. - A sample feedback form is annexed.

Period	Assignments to be carried out
	Other ongoing field activities - Exploratory drilling, geophysical studies, data entry in WIMS
II nd Review	Premonsoon Field Work
15 th June to 15 October	Data Analysis and Interpretation - Compilation & analysis of data collected during pre-monsoon field work - Completion of chemical analysis of samples collected and data validation - Preparation of thematic maps such as pre-monsoon DTW, EC, CI maps and identification of areas with quantity (deeper water level, declining trend, drying of wells/reduction of discharge) & Quality issues (F, NO₃, Fe, As) - Preparation of Location, LULC, Physiography & drainage, DEM, Hydrogeomorphic, Basin, rainfall histogram, Geological maps etc - Preparation of relevant chapters on the themes like Introduction, Physiography & drainage, Hydrometeorology, Hydrology, Landuse Landcover, Geology etc. - Tabulation and correlation of hydrogeological and geophysical data of existing EW, OW, PZ & DW, VES, TEM - Preparation of Cross sections (2D) showing aquifer disposition by correlating lithologs. - Conceptual 3D Model (which will be modified after getting more data during post-monsoon studies) - Analysis of lithologs and aquifer properties data of previous studies and their incorporation - Mapping of water bodies from Satellite Imagery and its comparison with toposheet for preparation of RWH & AR Plan - Collection of drilling & other related data from State Govt agencies, Drilling companies & NGOs Workshops and mid-term review by NLEC - Regional Workshops of officers involved in NAQUIM 2.0 studies to exchange experiences, field data collection strategies, new findings etc. - Mid-term review and guidance by the NLEC. - Communication and/or Presentation (preferably) before District Administrative Authorities
III rd Review	Mid-term Review
15 th October to 15 th December (20 to 25 days field work)	Field Data Collection - Post-monsoon water level monitoring - Monitoring of additional wells in areas identified with some issues based on level & quality monitoring data of pre-monsoon - Conducting pumping tests at field in irrigation wells, discharge vs drawdown measurement, quality checking with hand-held EC & pH meter, collection of drilling data from the pump/land owner etc. Sample Surveys and User Feedback: - Discussion with farmers and other users at ground level. Collection of information from local agencies or well owners about well depth, slotted zone/fracture zone, discharge (monitored wherever possible), static water level and random drawdown data, Irrigation Practices,

Period	Assignments to be carried out
	cropping pattern, traditional water conservation and management practices and related information. - Instantaneous discharge measurements, along with pump working hour information for estimating unit draft. - Similarly, feedback of the local users will form an important input for problem identification and characterization. Feedback are to be obtained in case of Urban areas, Industrial clusters also. Feedbacks on drinking water availability, dependence on ground water etc are also to be obtained. - A sample feedback form is annexed, which can be customized to the type of priority area and objective of the study. Other ongoing field activities - Exploratory drilling, geophysical studies, data entry in WIMS
IV th Review	Post monsoon Field work
15 th December to 15 th January	Data Analysis and Draft Report Preparation - Compilation & Analysis of Post-monsoon data (Statistical analysis based on geology, physiography, etc. can also be attempted) - Chemical Analysis of the post monsoon water samples (collected from selected wells for confirmation of issues) - Preparation of maps and tables- please refer priority area wise deliverables and outputs - Preparation of ground water management plan, analysis of existing practices and proposed measures under Supply side and Demand side measures with the expected impact on ground water system. - Draft Report writing work Other ongoing field activities - Exploratory drilling, geophysical studies, data entry in WIMS
V th Review	Ground Water Management Plan
15 th January to 15 th February (20 to 25 days 2 nd fieldwork)	- Field truthing of Management plan & RWH & AR Plan - Final Stage field visit for various field data collection & generation based on the requirement (data gap filling) as observed during draft report preparation Other ongoing field activities - Exploratory drilling, geophysical studies, data entry in WIMS
VI th Review	Report
15 th February to 15 th March	- Modification of draft report with additional information collected by the above mentioned field checks - Scrutiny and Finalisation of the Report Other ongoing field activities - Exploratory drilling, geophysical studies, data entry in WIMS
15 th to 31 st March	- Sharing of the reports with CHQ, SGWCC and DM/DC - Brochure to be prepared by 31st March. Other ongoing field activities - Exploratory drilling, geophysical studies, data entry in WIMS

Maps in 1:50,000 scale to be printed by 30th April. 60 to 75 days of field work is required for generating sufficient data in desired granularity for a study area varying from 300 to 800 Km² depending on the extent of hilly areas, urban & industrial agglomerations, mining areas etc. Being a tentative program, it can be modified based on the onset of monsoon and other factors. If possible, basecamp may be established in the administrative HQ or adjacent urban area. In case of manpower shortage, field officers can also be mobilized from other regions to cover more areas under the time frame. Major contributions of the officers are to be clearly mentioned in the report rather than repeating their name in every item of work. Six review meetings are proposed after completion of major tasks.

Regional Director/Member to assess the periodic achievements and suggest the course corrections if required. As specified in the previous section, such reviews will be done for every milestone (1. Inception report, 2. Premonsoon Field Work 3. Mid term Review 4. Postmonsoon Field work 5. Ground Water Management Plan and 6. Report Writing). An indicative proforma is annexed for review and verification of progress of activities.

6. Data Density

Data element	Indicative Density
Exploratory Drilling	After studying the Exploratory well density in the study area, new wells may be proposed based on the Exploratory well target. Exploratory drilling may be taken up in between two existing wells to validate the earlier analysis/profile/section. At least two for each principal aquifer type in the area
Pumping Test	At least one for each principal aquifer type in the area
Water Level	At least 3 water level per each aquifer (depth wise) for each GMU (Ground Water Management Unit) or 1 for every 10 sq. km, whichever is higher. A GMU could be a village, a ward, aquifer unit, geomorphology, LULC class or as relevant to the study. Deeper aquifers if available are to be treated as separate GMUs.
Water Quality	At least 3 sample per each Aquifer (depth wise) for each GMU or 1 for every 10 sq km, whichever is higher. At least one for each habitation in areas with ground water contamination.
VES/TEM/Imaging	At least 05 for each principal aquifer type in the area
Feedback and Sample survey	At least 1 for each village. OR At least 3 for each GMU (aquifer type or land use as relevant to the study).

7. Priority Area wise deliverables

S.No	Deliverables	1	2	3	4	5	6	7	8	9	10	11
1	Aquifer Dispositions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Aquifer-wise ground water Water Levels	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	Delineation of Recharge Areas	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	Estimation/Refinement of parameters used for resource assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	Assessment of ground water resources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	Location, Discharge and water quality of the springs, vulnerability of the springs				✓							
7	Demarcation of the springshed				✓							
8	Ground Water Quality in every habitation							✓				
9	Ground Water Quality	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	Areas showing signs of subsidence	✓	✓	✓			✓					
11	Extents of autoflow zones								✓			
12	Extent of saline ingress			✓								
13	Ground Water Quality Management Interventions including demarcation of safer aquifers	✓	✓	✓	✓			✓		✓		
14	Impact of Mining or Industrial activities and vulnerability of the aquifers.				✓							
15	Artificial Recharge Plan	✓	✓	✓	✓		✓				✓	
16	Other measures	✓	✓	✓	✓		✓				✓	
17	Identification of potential aquifers for drinking water supply	✓	✓	✓	✓	✓		✓		✓	✓	
18	A plan for drinking water source sustainability				✓						✓	
19	Identification of potential aquifers for Irrigation		✓	✓	✓			✓		✓		
20	Recommended interventions for containing saline ingress (Artificial Recharge, Regulation etc.)			✓		✓		✓				
21	Potential aquifers that can be used for carbon sequestration			✓			✓					
22	Recommendations for springshed management					✓						
23	Recommendations for spring water harvesting					✓						
24	Potential to be used as rainy-day resource.						✓					
25	Ways to minimise ground water losses because of free flowing wells.								✓			
26	Plan for Conjunctive use of surface water and ground water									✓		
27	Recommendations for tackling water logging		✓									
28	Demand driven studies like- Source Finding, Development of new cities, Waste disposal sites etc.											✓

1 : Water Stressed Areas; 2 : Urban Agglomerate; 3: Coastal Areas; 4: Industrial Clusters and Mining Areas; 5: Areas with Springs as the principal source; 6: Areas with Deeper Aquifers; 7: Ground Water Contamination; 8: Autoflow zones; 9: Canal Command Areas, 10: Areas with poor ground water availability, 11: Other specific Issues

*[Estimation of Unit draft to be carried out in each studies indicated above. Estimation of Recharge parameters to be restricted to all Conjunctive Use studies and any one Study each year for each Region. Such studies would be of 2 years duration]

8. Deliverable wise details

S.No	Deliverables	Inputs	Data Processing	Outputs
1	Aquifer Disposition	- Exploratory Drilling - Geophysical Studies. - Pumping Tests - Aquifer wise ground water quality analysis - Field exposures, well sections etc. - Aquifer wise water levels. - Farmer feedback	- All data to be entered in WIMS - Aquifer delineation by correlating Litholog, inferred logs from geophysical surveys, feedbacks, aquifer property, water quality. - Using all the above data for preparation of a 3D hydrogeological model. Modeling software like Rockworks can be used. - Hand drawn sections and block diagrams can also be included.	1. GIS based point map of aquifer disposition with following attributes Aquiferwise: Depth To Aquifer Top, Depth To Aquifer Bottom, Thickness, Potential Zone from, Potential Zone to Discharge (lps), T, S, Sy, Quality, 2. Aquifer information derived from Geophysical Study based inferred lithologs: Depth To Aquifer Top, Depth To Aquifer Bottom, Thickness, Potential Zone from, Potential Zone to Quality (Fresh/Saline). 3. 3D model -Cross Sections/Block diagrams. In Rockworks format and images.
2	Aquifer-wise ground water Water Levels	- Observed water levels including historical data. - R L of monitoring Stations - DEM	- All data to be entered in WIMS - Statistical analysis of water levels including timeseries analysis - GIS based data processing. - Use standard contouring methods. - Use constraints based on field observations, geomorphology for manual refinement of the contours. - Long-term Water Level Trends (longest available).	1. Aquifer-wise depth to water level maps (heat maps) 2. Aquifer-wise Contours of water table/ piezometric surface elevations and flow lines 3. Map showing water level trends 4. Representative hydrographs with trends 5. Area showing long-term water level changes.

S.No	Deliverables	Inputs	Data Processing	Outputs
3	Delineation of Recharge Areas	- Aquifer-wise Contours of water table - DEM (SRTM, ASTER) - R L Survey data - Toposheet, Google Map, Satellite Data (TM-7/8 or LISS-III) for drainage & water body mapping - Isotope Data - Land use	- Recharge areas are to be identified by integrating Surface elevation, Water table Contours, Flow lines, Aquifer types, Land use, water bodies, isotope data etc.	1. A map showing major recharge areas. If recharge area is outside the area of study, it also has to be shown.
4	Estimation/Refinement of parameters used for resource assessment	- All related field data, historical data as well as farmer feedbacks.	- Sample surveys for unit draft. - Infiltration studies for RIF - Chloride Mass balance for RIF estimate - Tritium injection studies for recharge rate - Pumping tests and dry season water balance for Sy - Pumping tests and slug tests for recharge rate from recharge wells. - Drum Culture for Recharge from Return flow from Irrigation - Study on recharge from water conservation structures. - Study on recharge from ponds, lakes flood plain areas. - Other standard methods as per the GEC 97 methodology or published literature may be used.	1. Maps and tables showing aquifer wise parameters. To be integrated with the aquifer disposition maps and tables.
5	Assessment of ground water resources	- All related data as per GEC. - Seasonal water table and piezometric surfaces measurements.	- Use the GEC methodologies- adapt the methodology to the study area scale and provide all details as per the methodology.	1. Regions (Ground Water Management Units) with attributes – recharge/discharge parameters,

S.No	Deliverables	Inputs	Data Processing	Outputs
		- Transmissivities	- May use any new criterion based on site specific issues. - Use $Q=TIL$ to calculate flow across boundaries	categorisation as per the GEC methodology. 2. The GMUs could be the aquifers, villages or other units. The Deeper aquifer can be treated as a separate GMU. 3. Seasonal inflow/outflow across the boundary to be shown on table along with a map.(The boundary may be split into a few section, as relevant to the study area-similar to what is done in a Modeling exercise)
6	Location, Discharge and water quality of the springs, vulnerability of the springs	- Historical data - Measurement of discharge & temperature - Quality of spring water quality	Statistical and spatial analysis of data	1. GIS based map of spring locations with the relevant attributes. 2. Identification of vulnerable springs.
7	Demarcation of the springshed	- Global datasets - Reduced Level Surveys - Spring discharges - Isotope studies	Spatial analysis of data	1. GIS based map
8	Ground Water Quality in every habitation	- Historical data, published literature - Collection and analysis of samples from every habitation	Statistical and spatial analysis of data	1. Geotagged locations of the sampling points, type of structure, probable depth, type of aquifer (mention aquifer number/ mixed aquifer.) 2. Sampling location details so that repeat sampling, if required can be carried out. 3. Parameter wise concentrations in the relevant units. 4. GIS based maps, Point maps with the concentration as attribute.

S.No	Deliverables	Inputs	Data Processing	Outputs
				5. Contouring wherever continuity is expected. 6. Description on probable sources and release mechanism 7. Ground Water Quality Hotspots
9	Ground Water Quality	- Historical data, published literature, analysis of samples of the ongoing study - (geogenic, man-made and pathogens) - Aquifer map with attributes - Land use map - Soil map - Thickness of weathered zone map - Other area specific activities (waste disposal, use of treated waste water) and their impact	- Statistical, spatial and time series Analysis - Hydrochemical diagrams. - Variation diagrams - Multi-variate statistical analysis like Principal Component Analysis. - Index overlays (may be DRASTIC). Correlation with aquifer type, land use etc.	1. GIS based maps, Point maps with the concentration as attribute. 2. Contouring wherever continuity is expected. 3. Description on probable sources and release mechanism 4. Vulnerability Map. 5. Ground Water Quality Hotspots 6. Impact of waste disposal sites 7. Impact of use of treated wastewater 8. Solute transport modeling in selected areas.
10	Areas showing signs of subsidence	- Published literature - SAR data - Signs of subsidence observed in field	- Analysis of Satellite data with published literature and field observations	1. Map showing zones of subsidence with relevant attributes.
11	Extents of autowflow zones	- Water Levels/ Piezometric heads - Feedback - Global datasets (SRTM, ASTER) - R L Field Survey	- Statistical Analysis, time series analysis and spatial analysis	1. Map showing areal extent of the autowflow zones
12	Extent of saline ingress	- Historical and current data of ground water quality - Water Levels	- Statistical Analysis, time series analysis and spatial analysis	1. Map showing extent of saline intrusion

S.No	Deliverables	Inputs	Data Processing	Outputs
		- Feedback - Global datasets (SRTM, ASTER) - R L Field Survey	- Hydrochemical facies –on map to identify if there is progressive salinisation or freshening.	2. Map showing migration of coastline (if available) 3. Map of hydrochemical facies 4. Zones of subterranean ground water discharge 5. Volume of water going to the sea (or entering into)
13	Ground Water Quality Management Interventions including demarcation of safer aquifers	- Aquifers - Water Levels - Ground Water Quality - Land use - Vulnerability map - Temporal variations - Sources of contaminants - Recharge Areas	- Delineate the safer aquifers - Analysis of recharge areas - Relation of quality issues with land use, aquifers, rainfall etc. -	1. Map of alternate safe aquifers, if available 2. Recommend measures for well-head protection 3. Recommend sites for waste disposal or changing sites of waste disposal 4. Recommendations regarding use of treated wastewater etc. 5. If well heads (or the recharge areas) are away from the wells they are to be shown on map 6. Locations and Designs of recommended structures
14	Impact of Mining or Industrial activities and vulnerability of the aquifers.	- Information about the mines or the industry - Aquifer geometry - Ground Water levels - Ground Water Quality - Flow lines and flow directions	- Statistical Analysis, time series analysis and spatial analysis	GW Abstraction by Industries, Water accumulation and Dewatering in Mining pits, Corresponding changes of GW storage Declining water level, deteriorating quality etc. Areas are to be shown on map.
15	Artificial Recharge Plan	- Analysis of SRTM, Toposheet, Satellite Data (TM-7/8 or LISS-III) & Google Map - m2/day	Soft rock Areas - Post Monsoon Pz head level > 10mbgl & T or Sp. Capacity* > 100 m2/day	1. Feasible areas are to be shown on GIS based maps with explanatory notes using the thematic layers of Geology, Geomorphology, Landuse/Land cover,

S.No	Deliverables	Inputs	Data Processing	Outputs
			Hard rock Areas Post Monsoon Pz head level >10mbgl & T or Sp. Capacity >20 Location finalisation based on DEM, Satellite Imagery, Toposheet, Panchayat Cadastral Map, Maps showing sustainability of aquifers for irrigation and drinking water State agencies can also be involved in preparation of Artificial Recharge Plans.	Lineaments, Structures, water levels during post monsoon. Declining trends of ground water and available surplus runoff. 2. Areas recommended for construction of AR structures in shallow aquifers; 3. Areas recommended for construction of AR structures in deeper aquifers; Recommended depths of structures; Locations and Designs of recommended structures
16	Other measures	- (demand side measures): crop diversification, micro- irrigation, regulation etc.	Agriculture & Irrigation data and Map of State Agencies LISS-III/ LISS IV Imagery Interpretation for Mapping of Rabbi Crop areas Field truthing to validate the map	1. Feasible areas are to be shown on GIS based maps, Tables with indicative estimates and description 2. Map based calculation of requirement of water for those crops classified. Based on the availability of all water resources, demand size management can be planned.
17	Identification of potential aquifers for drinking water supply	- Aquifer geometry - Aquifer Properties - Farmer Feedback - Geophysical Studies - Ground Water Quality	Already mentioned in Sections and 3DMap Map showing areas with assured water supply, irregular water supply & no water supply system. Management Plan for assured water supply (potential aquifer, probable yield & sustainability)	1. GIS based maps showing extent, depth, thickness and relevant properties of the aquifers as worked out earlier. Description. 2. Potential sites for drilling wells from geophysical studies

S.No	Deliverables	Inputs	Data Processing	Outputs
18	A plan for drinking water source sustainability	Refer the Source Sustainability SoP.		1. Maps showing location of proposed interventions and description.
19	Identification of potential aquifers for Irrigation	- Resource Assessment Results - Yield of aquifers - Drawdown - Water Levels	Hard rock area Sustainable: Shallow fractures (within 75 m), Yield >3lps, Post-monsoon dtwl < 10 mbgl, drawdown (DD) within 10 m Moderate sustainability: Shallow fractures with Yield between 1-3lps & Deeper fractures (beyond 75 m of depth) with Yield >3lps. Post-monsoon dtwl < 10 mbgl, DD < 10 m for both the aquifers Poor Sustainability: Shallow fractures with Yield < 1 lps & Deeper fractures with yield between 1-2 lps. Post-monsoon dtwl > 10 mbgl, DD > 20 m for both the aquifers Soft rock area Sustainable: Yield > 10 lps, Post-monsoon dtwl < 10 mbgl, DD within 10 m Moderate sustainability: Yield between 5-10 lps, Post-monsoon dtwl < 10 mbgl, DD within 10 m & Yield > 10 lps. Post-monsoon dtwl between 10 - 20 mbgl, DD > 10 m Poor Sustainability: yield between 1-5 lps. Post-monsoon dtwl > 10 mbgl, DD > 10 m	- Maps showing areas suitable for shallow & deeper aquifers for further ground water development (extent, depth, thickness and relevant properties can be mentioned) - Potential sites for drilling wells (points to be provided based on geophysical studies) with details
20	Recommended interventions for	- Map showing extent of saline intrusion	- Spatial analysis and integration of the data.	1. GIS based maps with relevant attributes. The Information are

S.No	Deliverables	Inputs	Data Processing	Outputs
	containing saline ingress (Artificial Recharge, Regulation etc.)	- Map showing migration of coastline (if available) - Map of hydrochemical facies - Zones of subterranean ground water discharge - Volume of water going to the sea (or entering into) - Recharge and draft components		also to be provided in a table along with description 2. GIS based map of feasible areas for other types of interventions. 3. GIS based map showing locations and design of structures
21	Potential aquifers that can be used for carbon sequestration	- Aquifer geometry - Aquifer properties	- Please refer standard literature	1. GIS based maps (extent, depth, nature and thickness of the confining layer, Aquifer properties etc.)
22	Recommendations for springshed management	- GIS based map of spring locations with the relevant attributes. - Vulnerable springs. - Spring discharge and quality	- Statistical Analysis, time series analysis and spatial analysis	1. GIS based maps with explanatory notes Locations and Designs of recommended structures
23	Recommendations for spring water harvesting	- GIS based map of spring locations with the relevant attributes. - Vulnerable springs. - Spring discharge and quality	- Statistical Analysis, time series analysis and spatial analysis	1. Location and design of the structures to be shown on a GIS based map. 2. Locations and Designs of recommended structures
24	Potential to be used as rainy-day resource.	- Aquifer geometry - Aquifer properties	- Analysis of sustainability of the aquifers - Analysis of Techno-economic feasibility of construction of wells	1. GIS based maps (extent, depth, Aquifer properties etc., sustainability, Recharge areas etc.)
25	Ways to minimise ground water losses because of free flowing wells.	- Inventory of auto flowing wells	- Analysis of temporal and spatial variation in discharge, quality - Water budgeting based on GEC methodology	1. Recommendations with map showing areas where such recommendations can be implemented.

S.No	Deliverables	Inputs	Data Processing	Outputs
		- Seasonal Flowing discharge (pre, post) and quality (pre monsoon) - Historical data on discharge, quality Aquifer properties		2. Recommendation on well design including mechanism for regulated discharge of auto-flowing wells
26	Plan for Conjunctive use of surface water and ground water	- Map of command area - Extended influence area of the Command - Ground Water Quality - Details of canal - Volumetric input of surface water and ground water in the command area - Cropping pattern	Water budgeting based on GEC methodology	1. Must include a GIS map showing locations of the interventions. 2. Tabular statements of conjunctive use plan
27	Recommendations for tackling water logging	- Aquifer geometry, properties and chemistry. - Water Levels - Satellite data - Ground water as well as surface water chemistry	- Statistical Analysis, time series analysis and spatial analysis	1. Map of waterlogged areas 2. Map showing areas prone to water logging 3. Feasibility of artificial recharge or 4. Vertical drainage interventions
28	Demand driven studies like- Source Finding, Development of new cities, Waste disposal sites etc.	- As per the study requirement	- As per the study requirement	1. Case specific outputs with maps

9. Forms of outputs

Detailed information for water professionals and researchers	Planners, Administrators	Grassroots level users
- All the raw data is to be entered in WIMS. - The GIS maps (.shp or .tab files) as per the deliverables - All maps to be congruous with adjoining boundaries. - are to be shared with NWIC. - Detailed Reports	- Printed maps (as per the deliverables) on 1:50,000 scale. - Brief recommendations - Presentations - Detailed Report	- Brochures in English/Hindi or local language

10. Guidelines for Quality Control

The core objective of NAQUIM 2.0 is to present implementable groundwater management plans and strategies to the user agencies. Therefore, there is a requirement for Quality control of the studies undertaken in NAQUIM 2.0. A five pronged strategy is proposed to ensure quality of the studies.

SoP	Pre Implementation Workshop	Inception Reports	Mid-term review	Grading of the studies
• An SoP is required to be prepared and distributed. • The SoP needs periodic revision based on feedback from field officers	• A training workshop shall be organized in the month of April, preferably at RGI • It will include presentation by experts, as well as presentations on representative studies of previous years. • Discussion on the SoPs • States can also be invited for the workshops	• An inception report with detailed work plan must be prepared before taking up the study	• Mid-term workshop on NAQUIM , to be organized by a group of Regions / individual Regions • Objective, plan of execution and interim results/findings of each study to be presented in the Workshop • The work shall be reviewed by experts and course corrections suggested, if required • NLEC or similar expert Committees to be constituted, if necessary	• Innovative studies to be tagged with 'Star' (*) • Tagging to be done by the Expert team (given in footnote) ○ Tagging to be reviewed and approved by NLEC or similar expert committee and Show cased as 'NAQUIM 2.0 SUCCESS STORY'

NB: Experts team of 3/5 persons consisting – Member (In-charge of Region) or his nominee Senior Officer CHQ; Retired CGWB/State Officers, Academician/Researchers and Regional Director

Inception Report Format

- About the study area
- Priority types
- Previous Studies- NAQUIM reports, District Brochure, Resource Assessment Report, Reappraisal Report, Systematic Survey Report, Published papers, New paper articles etc.
- Objectives of the present study
- Existing data- EW/OW, VES/TEM, WL (NHS and Aquifer Mapping), WQ, Infiltration Test, Pumping Tests.
- Data gap analysis
- New Data generation plan- Activity wise monthly targets for new data generation. Plan for integration with other ongoing activities.
- Month-wise activity plan – field visits, visits to local offices, training, report writing, sharing with the concerned departments, entering data in WIMS, Progress Reporting in MIS, uploading reports and media in publications warehouse.
- Composition of the team.
- Team-member-wise responsibilities and monthly targets for entering in the MIS

Annexure -II

Final Report Format

- Introduction
- About the study area (geography, geomorphology, rainfall, land use, irrigation, crops etc.)
- Priority types
- Previous Studies- NAQUIM reports, District Brochure, Resource Assessment Report, Reappraisal Report, Systematic Survey Report, Published papers, New paper articles etc.
- Objectives of the present study
- Each deliverable will be a chapter with the following structure
 - Objective
 - Material and methods
 - Results and Discussions
- Any other chapter as per the study specific requirement
- Conclusions and recommendations
- Supplementary Material(Annexure):
 - All raw datasets (Water level, water quality, VES, TEM, Pumping Tests, Statistical Data)
 - Copies of feedback of the farmers obtained from the field

Annexure -III

Farmer Feedback Form

Photograph			
Name			
Village			
Block			
District			
Address			
Mobile Number (optional)			
Type and number of structures			
Type			
Number			
(coordinates of the structures are to be obtained by the field officer)			
Drill time discharge (lps)			
Depth of installation of pump			
Casing depth (Bore wells) HR			
Fracture encountered depth- HR			
Slotted pipe depths (TW) SR			
Average water levels – pre-monsoon			
Average water levels – post-monsoon			
The well is used for			
Is water available throughout the year			
If not for how many months water is available			
Pumping Duration			
	Number of days pump is operated (days) of each well	What is the average pumping duration (in hours) of each well	Instantaneous Discharge Measurement (to be carried out by the field officer) in lps
Rabi (no of months to be specified)			

Kharif (no of months to be specified)			
Others (no of months to be specified)			
Area Irrigated			
	Area Irrigated	Type of crop taken	Remarks
Rabi (no of months to be specified)			
Khariff (no of months to be specified)			
Others (no of months to be specified)			
Cropping patterns (past and present) in the village			
Traditional Cropping pattern in the village	Kharif	Rabi	Other
Type of Crop			
Area under crop			
Prevailing Cropping pattern in the village	Kharif	Rabi	Other
Type of Crop			
Area under crop			
Reasons for change in cropping pattern in last 20 years.			
If the cropping pattern is to be changed, which are the suitable crops that can be grown			
Available Market for the crop			
Average unit cost of production			
Average unit cost of selling			
Existing MSP and other related information	Crop wise details are to be collected		
Other subsidies, facilities, restrictions.			
Source of Energy			
Solar	☐ Is it connected to grid ☐ If yes how much incentive do you get per month on an average for feeding electricity to the grid (Rs per month)		
Electric	☐ Do you get free electricity for irrigation? ☐ Do you pay a fixed charge ☐ If a fixed charge is paid, what is the per month charge ☐ If unit-based charges are paid what is the average monthly charges in rupees ☐ During kharif---- ☐ During Rabi-----		
Diesel	☐ Average consumption of diesel (liters) per month ☐ During Kharif ☐ During Rabi		

Water Market*	○ Do you share the pumped water with other farmers ○ If yes ○ For how many days do you share pumped water in Kharif ○ For how many days do you share pumped water in Rabi Period ○ On an average how much do you charge per annum (in Rs)
	○ Do you receive additional water from boreholes of nearby farmers ○ If yes ○ For how many days do you receive pumped water in Kharif ○ For how many days do you receive pumped water in Rabi Period ○ On an average how much do you pay per annum (in Rs)
Other issues/Remarks	e.g. common problems in drilling of wells, common health issues in the area etc
- Feedback of the local users will form an important input for problem identification and characterization. Feedbacks are to be obtained in case of Urban areas, Industrial clusters also. Feedbacks on drinking water availability, dependence on ground water etc are also to be obtained. The above feedback form can be customized to the type of priority area and objective of the study.	

Annexure -IV

Periodic review of activities

Study Area: sq.km, block, district, state etc.

Priority Types:

Team Lead:

Team Members (HG, CH, GP and others)

Sr. No.	Activity	Progress report to be updated on a monthly basis for review by Team lead /Regional Director/Member
1	Inception report	Submitted (Y/N) Date of submission
2	Field Work- I (Premonsoon)	Officer wise field days Officer Name : No of field days (from to)
3.	Apprising Block level and District level Authorities	Y/N Meeting / Presentation
3	Field Work – II (Post monsoon)	Officer wise field days Officer Name : No of field days (from to)
4	Field Work- III (Dec-Jan)	Officer wise field days Officer Name : No of field days (from to)
5	Existing data -EW/ OW/ Water Level /Quality/VES/TEM etc.	Collection of data and entering in WIMS
6	New EW/OW/PZ drilled	Numbers drilled EW/OW data entered in WIMS
7	Pumping Tests carried out	Numbers and duration of pumping
8	Studies for estimation of parameters used in resource assessment	Please specify
9	Number of water level /spring discharge data (pre-monsoon)	Aquifer I: ; Aquifer II: ; Aquifer III:;; Water Level Data entered in WIMS (Y/N)
10	RL survey of wells done	Numbers
11	Number of water data /spring discharge (post monsoon)	Aquifer I: ; Aquifer II: ; Aquifer III:;; Water Level Data entered in WIMS (Y/N)
12	Number of samples collected (pre-monsoon)	Aquifer I: ; Aquifer II: ; Aquifer III:;;
13	Number of samples collected (post-monsoon)	Aquifer I: ; Aquifer II: ; Aquifer III:;;
14	Number of samples analysed	Aquifer I: ; Aquifer II: ; Aquifer III:;; Results entered in WIMS
15	Number of VES/ TEM/Imaging	Number of studies carried out; Results entered in WIMS
16	Number of sample surveys done	Numbers
17	Mid-term appraisals done	Number, dates and other details
18	Other field studies done	Please specify
19	Outputs as per the deliverables	Deliverables completed Number of GIS based maps prepared.
20	Final Report	Submitted and uploaded in website
21	Sharing of report	Presentation before DM/DC

CGWB

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ARTIFICIAL RECHARGE STRUCTURES IN INDIA:

VIII Plan (1992-97)					
S.No.	State	District	Type of Structure Constructed	Total Structure Constructed	Cost (in Lakhs)
1	Jammu and Kashmir	Jammu	Deepening of Pond-1 Roof Top Rain Water Harvesting -2	4	
		Kathua	Sub Surface Dyke - cum - Check Dam -1		
1	Karnataka	Kolar	Check Dams - 21 Percolation Tank - 2 Earthern Bund - 1 Boulder Cheicks - 98 Rubble Checks - 35 PRS - 5 Gravity Recharge Wells - 2 Roof Top Rain Water Harvesting - 1	165	44.116
3	Kerala	Palghat	Sub-surface Dam-1	2	
		Trivandrum	Sub-surface Dam-1		6.27
4	Madhya Pradesh	Burhanpur	Sub Surface Dyke- 2	8	
		Rajgarh	Sub Surface Dyke- 1		2
		Dewas	Sub Surface Dyke-1 Boulder check Dam-1 Gabion Structure-1		3.2
		Bhopal	Sub surface Dyke-1 Contour trench (460m) Sand bag nala bund-1		2.26
		Khargone	Sub Surface Dyke-1		2.38
5	Maharashtr a	Amravati	Percolation Tank- 5 Cement Plugs 10 Underground Bandharas-5	29	71.81
		Jalgaon	Percolation Tank - 3 Conversion of Village Tank to Percolation Tank-2 Nallah Diversion-1 Injection Well-1 Recharge Shaft-1 Dugwell Recharge-1		29.79
6	Tamil Nadu	Dharmapuri	Sub Surface Dyke-1	3	4.5
		Namakkal	Sub Surface Dyke-1		4
		Dharmapuri	Sub Surface Dyke-1		6.5
7	Telangana	Ranga Reddy	Sub Surface Barrier-1	1	
8	West Bengal	Purulia	Sub Surface Dyke-5	18	0.38
		Bankura	Sub Surface Dyke-13		0.99
TOTAL				230	178.20

IX Plan (1997-2002)

S.No.	State	District	Type of Structure Constructed	Total Structure Constructed	Cost (in Lakhs)
1	Arunachal Pradesh	East Siang	Roof Top Rain Water harvesting-5	5	
		West Siang East kameng	Demonstrative Project on Artificial Recharge to Groundwater Rainwater Harvesting	80	
2	Assam		Roof Top Rain Water harvesting-14	14	
3	Chandigarh	Chandigarh	Roof Top Rain Water harvesting Piezometers Recharge pit with Injection wells	56	64.44
		Chandigarh	56 recharge structures (Each Recharge pit with 2 Injection wells)		
4	Haryana	Kurukshetra	Recharge pit with Injection wells Recharge shafts		19.19
		Faridabad	Recharge pit with Injection wells		1.7
		Mahendergarh	Recharge pit with Injection wells		52.71
		Kurukshetra	Subsurface Dyke cum check dam		12.61
		Panipat	Injection Well		16.96
5	Himachal Pradesh	Kangara	Check dam cum groundwater dam-1	6	24.137
		Kangara	Check Dam-2		46.96
		Hamirpur	Check Dam-1		65
		Kangara	Roof Top Rain Water harvesting-1		2.053
		Kangara	Roof Top Rain Water harvesting-1		1.99
6	Jharkhand	Ranchi	Roof Top Rain Water harvesting-3	3	
7	Karnataka	Bangalore	Check Dams - 5 Vertical Shaft - 1 Roof Top Rain Water Harvesting - 1 Boulder Check - 3	10	43.3
8	Kerala	Ernakulam	Sub-surface Dam-1	15	
		Kasargod	Deepening of Pond -1 Deepening cum desiltation of tank-1		6.597
		Kannur	Roof Top Rainwater Harvesting-2 Check Dam-1 Recharge Pit-1		99.9
		Trivandrum	Sub-surface Dam-1		6.25
		Palghat	Sub-surface Dam-2		13.15
		Trivandrum	Tidal Regulator-1		15
		Kottayam	Sub-surface Dam-1 Percolation Tank-1 Recharge Well-1		13.82
		Kollam	Sub-surface Dam-1		7.364

9	Madhya Pradesh	Dewas	Roof Top Rain Water harvesting filters-1000 Recharge Shafts-5 Roof Top Rain Water Harvesting-1	1029	18.52
		Indore	Roof Top Rain Water harvesting in PHED Colony, Musakhedi-1		6.94
		Mandsaur	Percolation Tank-1 Check Dam-2 Cement plug-1 Gabion structure-19		23.48
10	Maharashtra	Jalgaon	Percolation Tank- 5 Recharge Shaft-5	12	74.33
		Nagpur	Roof Top Rain Water Harvesting through existing Dug Well-1		1.5
		Warud	Roof Top Rain Water Harvesting through recharge well-1		0.8
11	Meghalaya		Roof Top Rain Water harvesting-6	6	
12	Mizoram		Roof Top Rain Water harvesting -35	35	
13	Nagaland		Roof Top Rain Water harvesting-42 Demonstrative artificial recharge -80	122	
14	Punjab	Jalandhar	Artificial recharge Structure		9.893
		Kapurthala	Artificial recharge Structure		
		Amritsar	Recharge Wells-4 Roof Top Rain Water harvesting-1		10.75
		Sangrur	Artificial recharge Structure		73.3
		Patiala	Artificial recharge Structure		11.57
		Ludhiana	Artificial recharge Structure		1.55
		Jalandhar	Artificial recharge Structure		11.62
		Patiala	Artificial recharge Structure		30.45
			Artificial recharge Structure		29.35
		Ropar	Check dams-5		166.4
		Patiala	Artificial recharge Structure		29.8
			Artificial recharge Structure		17.01
		Ludhiana	Artificial recharge Structure		9.48
		Fatehgarh Sahib	Recharge pit with Injection wells-1		5.775
		Jalandhar	Recharge pit with Injection wells-1		4.795
		Patiala	Recharge pit with Injection wells-1		20.77
		Amritsar	Artificial recharge Structure		55.67
		Tarn Taran	Artificial recharge Structure		55.67
		Moga	Artificial recharge Structure		179.453
		Chandigarh	Artificial recharge Structure		543.22
15	Rajasthan	Jaipur	Roof Top Rain Water harvesting -15	16	3.96
		Udaipur	Roof Top Rain Water harvesting -1		
16	Tamil Nadu	Villupuram	Sub-surface dyke -1	8	8
		Coimbatore	Percolation pond-4		42.1
		Villupuram	Percolation pond, Desilting & strengthening of bunds etc		71.36

		Virudhunagar	Percolation pond-1		6.51
		Chennai	Percolation pond-1		8.97
		Tiruchchirappalli	Sub surface Dyke-1		13
		Ramanathapuram	Rain Water Harvesting Structures		14.2
17	West Bengal	Purulia	Farm Pond-13 Sub Surface Dyke-8 Nala Bund-16 Re excavation of pond-15 Percolation tank-15 Contour bund(1.2 km) Monitoring well-5	104	50.44
		Medinipur	Percolation tank – 17 Contour bund – 2 Km. Sub-Surface Dyke – 8 Monitoring well – 9		33.32
		Parganas	Excavation of silt (69000 m3)		12.02
		Hooghly	Re-excavation of pond supported by recharge shafts – 2		8.79
		Birbhum	Recharge shaft – 4 Piezometers - 3		7.65
		Kolkata	Recharge tube well – 2 Piezometers - 1		10.65
18	Uttar Pradesh	Baghpat	Roof Top Rain Water harvesting		5
		Lucknow	Roof Top Rain Water harvesting		3.25
		Lucknow	Roof Top Rain Water harvesting		1.97
		Lucknow	Roof Top Rain Water harvesting		1.97
		Aligarh	Storm water Recharge		32.76
		Bhadohi	Roof Top Rain Water harvesting		11.82
		Allahabad	Roof Top Rain Water harvesting		4.6
		Allahabad	Roof Top Rain Water harvesting		5.83
		Lucknow	Roof Top Rain Water harvesting		69.85
Total				1521	2333.247

X Plan (2002-2007)					
S.No.	State	District	Type of Structure Constructed	Total Structure Constructed	Cost (in Lakhs)
1	Andhra Pradesh	Kadapa	Check Dams-15 Percolation Tank-7	22	
2	Kerala	Palghat	Sub-surface Dam -1 Check Dams-1	6	16.421
		Kasargod	Check Dams-1 Rain water Harvesting, Artificial recharge-1		13.56
		Trivandrum	Sub-surface Dam -1 Rain water Harvesting, Artificial recharge-1		32.943
3	Madhya Pradesh	Dewas	Percolation Tank-1 stop Dam-11 Recharge shaft-1 Gabion structure-10 Roof Top Rain Water Harvesting-2 Sub surface Dyke-1 Piezometer-15 (for monitoring)	41	49.06
		Betul	Percolation Tank-1 Check Dam-23 Recharge shaft-3 Piezometer-40 (for monitoring)	67	99.81
4	Tamil Nadu	Salem	Percolation pond, Check Dam with recharge wells, Percolation Pond with recharge wells	41	223.15
5	Telangana	Mahabubnagar	Check Dams-3 Percolation Tank-6 Roof Top Rain Water Harvesting-30 Recharge Pits-5 Sumps-2 Desilting of Pond-1 Piezometers-6	52	
6	UT of Lakshadweep	Kavaratti	Rain water Harvesting, Artificial recharge-1	1	11.01
Total				189	445.954

XI Plan (2007-2012)					
S.No.	State	District	Type of Structure Constructed	Total Structure Constructed	Cost (in Lakhs)
1	Andhra Pradesh	Chittoor	Check Dam-28 Percolation Tank-1	29	
2	Bihar	Jamui	Check Dam-6	11	
		Munger	Checkdam-5		
3	Gujarat	Patan	Recharge Tubewells-20 Piezometers-6	26	146.33
4	Himachal Pradesh	Kangra	Check Dam-4	13	
		Sirmaur	Check Dam-1		
		Una	Bore Well Recharge-1		
		Hamirpur	SSD-1 Check Dam-4 Rain Water Harvesting-1		
		Solan	Rain Water Harvesting-1		
5	Jammu and Kashmir	Kathua	Check Dam-2	4	
		Jammu	Check Dam-1		
		Udhampur	Check Dam-1		
6	Jharkhand	Ranchi	Recharge Pit with Recharge Bore Well-54	54	
7	Kerala	Karargod	Artificial recharge Structure-5 Renovation of Existing Pond-1	6	25.77
		Palakkad	Rain Water Harvesting-1		4.32
8	Madhya Pradesh	Ratlam district	Stop dam-14 Recharge shaft-14 Piezometer-14 (for monitoring)	153	302.68
		Ujjain District	Percolation tank -1 Recharge trench -1 stop dam-3 Recharge shaft-19 Gabion-6 Subsurface dyke-4 Step recharge trench-2		138.07
		Dhar district	Percolation tank -1 Recharge shaft-47 Piezometer-27 (for monitoring)		162.95
9	Maharashtra	Nagpur	Loose Boulder Structure-32 Earthen Structure-2 Gabion Structure-8 Earthen Nala Bandh-3 Cement Nala Bandh-1 Pond-3	49	15.15
10	Tamil Nadu	Salem	Desilting of ponds, percolations ponds with recharge bore wells-66	338	111

		Namakkal	Check Dam-10 Recharge Shaft -20 Recharge Bore Wells – 20 De-silting of Ponds – 2		275.35
		Coimbatore	Recharge Bore Wells - 215		100
		Chennai	Percolation Pond , Recharge bore well, Roof Top Rainwater Harvesting -5		40
11	Telangana	Medak	Check Dam-34 Percolation Tank-18 Peziometers-52	151	
		JNTU, Hyd	Recharge Shaft-6 Peziometers-3 Roof Top Rain Water harvesting -7 Peziometers (for monitoring)-3		
		KU, Warangal	Check Dam-9 Percolation Tank-4 Gabion Structure-1 Roof Top Rainwater Harvesting-9 Peziometers (for monitoring)-3		
		CGWB, Hyd	Check Dams-2		
12	Uttar Pradesh	Rai Bareli (Sataon)	Check dam-16 Recharge well -12 Recharge trench-180 Recharge pit -920 Piezometer-20 (for monitoring)	1369	720.06
		Lucknow	Artificial recharge Structure-116		1060.6
		Jhansi	Check Dams-32		990.88
		Rai Bareli (Sarein & Lalganj)	Check Dam - 13 Recharge Trench - 50 Piezometers-10		514.65
Total				2203	4607.9

Other Artificial Recharge Projects

S.No.	Name of the Project	State	District	Type of Structure Constructed	Total Structure Constructed	Cost (in Crores)	Status
1	Aspirational Districts (2018-2020)	Andhra Pradesh	YSR Kadapa	Check dams- 16 Percolation tanks-4 Sub-surface barrier-1 Recharge shaft- 36 Piezometers (for monitoring)-12	69	54.38	Completed
		Maharashtra	Osmanabad	Check Dam-55 Piezometers- 20 Recharge wells-46	121		
		Telangana	Warangal	Check Dam-6 Sub-surface barrier-1 Piezometers- 9 Recharge shaft- 31	47		
2	Construction of Bridge Cum Bandhara(BCB) (2018-2020)	Maharashtra	Wardha	BCB-1	5	30.29	Completed
				BCB-1			
				BCB-1			
				BCB-1			
			Amravati	BCB-1			
3	AR Project Rajasthan Phase I (Ongoing since 2019)	Rajasthan	Jodhpur	Zoned Earth Fill Dam with Clay Core	1	15.21	Ongoing
			Jodhpur	Concrete Gravity Dam	1	19.42	Ongoing
	AR Project Rajasthan Phase II (Ongoing since 2019)	Rajasthan	Jodhpur	Check Dam-54 Anicut-24 Recharge Shaft-2	80	74.32	Ongoing
			Jaisalmer				
			Sikar				
	AR Project Rajasthan Phase III (Ongoing since 2019)	Rajasthan	Jodhpur	Check Dam-4	4	61.82	Ongoing
				Anicut-7	7		
			Alwar	Anicut-1	1		
			Barmer	Check Dam-2	2		
				Anicut-2	2		
			Jaisalmer	Check Dam-2	2		
Total					342	255.44	

Annexure VIII:

State wise summary of Public Interaction Programmes (PIP) organised and number of participants during 2018 to 31 st March 2024.			
Sl No.	State/UT	Total (from 2018-31 st March 2024)	
		PIP conducted	Total No of people sensitized
1	Andhra Pradesh	38	2820
2	Bihar	47	4292
3	Chandigarh	4	137
4	Chhattisgarh	80	7226
5	Goa	2	97
6	Gujarat & UT of Daman & Diu	73	5357
7	Haryana	33	3105
8	Himachal Pradesh	56	4890
9	Jammu & Kashmir	30	1811
10	Ladakh	2	41
11	Jharkhand	45	4275
12	Karnataka	91	6899
13	Kerala	70	5332
14	Madhya Pradesh	76	7260
15	Maharashtra	84	8027
16	NER States	97	7213
17	Odisha	93	8701
18	Punjab	41	5994
19	Rajasthan	59	4994
20	Delhi	22	1684
21	Tamil Nadu & U.T of Puducherry	92	10248
22	Telangana	67	4157
23	Uttar Pradesh	128	13050
24	Uttarakhand	28	2181
25	West Bengal	81	6443
	Total	1439	126234
The PIPs were initiated in 2018			

Name of Ministry/Department-Ministry of Jal Shakti

Department of Water Resources, RD & GR

Year-2019 (1st National Water Awards 2018)

Sl. No.	Name of Awardee	State	Category (if applicable)
1	Maharashtra	Maharashtra	Best State (1 st)
2	Gujarat	Gujarat	Best State (2 nd)
3	Andhra Pradesh	Andhra Pradesh	Best State (3 rd)
NORTH			
Ground Water Recharge			
4	Jalaun	Uttar Pradesh	Best District (1 st)
5	Kargil	J&K	Best District (2 nd)
6	Rewari	Haryana	Best District (3 rd)
Revival of River			
7	Almora	Uttarakhand	Best District (1 st)
8	Chitrakoot	Uttar Pradesh	Best District (2 nd)
9	Lalitpur	Uttar Pradesh	Best District (3 rd)
Rejuvenation/Creation of Water Bodies			
10	Kargil	J&K	Best District (1 st)
11	Lalitpur	Uttar Pradesh	Best District (2 nd)
12	Ludhiana	Punjab	Best District (3 rd)
SOUTH			
Ground Water Recharge			
13	Ananthapuramu	Andhra Pradesh	Best District (1 st)
14	Kamareddy	Telangana	Best District (2 nd)
15	Madurai	Tamil Nadu	Best District (3 rd)
Revival of River			
16	Kurnool	Andhra Pradesh	Best District (1 st)
17	Pathanamthitta	Kerala	Best District (2 nd)
18	Tirunelveli	Tamil Nadu	Best District (3 rd)
Rejuvenation/Creation of Water Bodies			
19	Madurai	Tamil Nadu	Best District (1 st)
20	Ernakulam	Kerala	Best District (2 nd)
21	Sivgangai	Tamil Nadu	Best District (3 rd)
WEST			
Ground Water Recharge			
22	Ahemdnagar	Maharashtra	Best District (1 st)
23	Patan	Gujarat	Best District (2 nd)
24	Bhopal	Madhya Pradesh	Best District (3 rd)
Revival of River			
25	Latur	Maharashtra	Best District (1 st)
26	Wardha	Maharashtra	Best District (2 nd)
27	Indore	Madhya Pradesh	Best District (3 rd)

Rejuvenation/Creation of Water Bodies

28	Beed	Maharashtra	Best District (1 st)
29	Udaipur	Rajasthan	Best District (2 nd)
30	Morena	Madhya Pradesh	Best District (3 rd)

EAST**Ground Water Recharge**

31	Koderma	Jharkhand	Best District (1 st)
32	Koraput	Odisha	Best District (2 nd)
33	Munger	Bihar	Best District (3 rd)

Rejuvenation/Creation of Water Bodies

34	Koderma	Jharkhand	Best District (1 st)
35	Koraput	Odisha	Best District (2 nd)
36	Patna	Bihar	Best District (3 rd)

NORTH EAST**Rejuvenation/Creation of Water Bodies**

37	South Tripura	Tripura	Best District (1 st)

ASPIRATIONAL DISTRICT**Ground Water Recharge**

38	Baran	Rajasthan	Best District (1 st)
39	Visakhapatnam	Andhra Pradesh	Best District (2 nd)
40	Narmada	Gujarat	Best District (3 rd)

Revival of River

41	YSR Kadapa	Andhra Pradesh	Best District (1 st)

Rejuvenation/Creation of Water Bodies

42	Rajgarh	Madhya Pradesh	Best District (1 st)
43	Garwa	Jharkhand	Best District (2 nd)
44	Sonbhadra	Uttar Pradesh	Best District (3 rd)

45	Mahud BK. Panchayat Solapur	Maharashtra	Best Village Panchayat (1 st)
46	Kinanoor GP- Karindalam P. O, Kasaragod	Kerala	Best Village Panchayat (2 nd)
47	Khatiya Panchyat Kutch	Gujarat	Best Village Panchayat (3 rd)
48	Betul,	Madhya Pradesh	Best Municipal Corporation (1 st)
49	Tharangambadi town panchayath	Tamil Nadu	Best Municipal Corporation (2 nd)
50	Manalmedu	Tamil Nadu	Best Municipal Corporation (3 rd)

51	Project Glacier- Govt Middle School Karith	J&K	Best Research / Innovation/ adpatation of New Technology (1 st)
52	Dr Jitendra Sinha	Chhattisgarh	Best Research / Innovation/ adpatation of New Technology (2 nd)
53	Sadbhavana Gramin Vikas Sanstha	Maharastra	Best Research / Innovation/ adpatation of New Technology (3 rd)
54	Isha Foundation- Rally of Rivers, Coimbatore,	Tamil Nadu	Best Education/Mass Awareness efforts (1 st)
55	Water and Sanitation Management	Gujrat	Best Education/Mass Awareness efforts (2 nd)
56	Dr. Baldev Raj, Sirsa	Haryana	Best Education/Mass Awareness efforts (3 rd)
57	Janta Darbar, Doordarshan	Maharashtra	Best TV Show for promoting Water Conservation (1 st)
58	Eenadu Television Pvt Ltd	Telangana	Best TV Show for promoting Water Conservation (2 nd)
59	Dainik Jagran, Sonbhadra,	Uttar Pradesh	Best Newspaper (Hindi) (1 st)
60	Dainik Jagran	Uttar Pradesh	Best Newspaper (Hindi) (2 nd)
61	Water Digest	Haryana	Best Newspaper (English) (1 st)
62	Maharashtra Sinchan Vikas(Marathi),	Maharashtra.	Best News Paper (Regional) (1 st)
63	Lokmat Media Pvt.Ltd, (Marathi)	Maharashtra	Best News Paper (Regional) (2 nd)
64	Government High School Panithittu , Kirumampakkam	Puducherry	Best School (1 st)

65	S C Girls Government Residential school, Jau tq ; Nilanga Latur,	Maharashtra	Best School (2 nd)
66	DPS Dwarka,	New Delhi	Best School (3 rd)
67	Dept.of Geology, Kakatiya University, Warangal,	Telangana	Best Institution for Successful Campus Usage(1 st)
68	Panjab University,	Chandigarh	Best Institution for Successful Campus Usage(2 nd)
69	St.Mary College, Manarcaud, Kottayam	Kerala	Best Institution for Successful Campus Usage(3 rd)
70	Brookefields Kundalahalli Residential Welfare Trust, Kundalahalli, Banglore,	Karnataka	Best Resident Welfare Association(1 st)
71	Jains Green Acres Flat Owner's Association, Jains Green Acres , Zamin Pallavaram, Chennai,	Tamil nadu	Best Resident Welfare Association(2 nd)
72	JR Nagar Resident Welfare Association, Vishakapatnam,	Andhra Pradesh	Best Resident Welfare Association(3 rd)
73	Sri Varaha Lakshmi Narasimha Swamy Devasthanam, Simhachalam, Visakhapatnam	Andhra Pradesh	Best Religious/ Recreational & Tourism water Users(1 st)
74	Dhruvansh Organisation, Hyderabad,	Telangana	Best Religious/ Recreational & Tourism water Users(2 nd)
75	Santhigiri Ashram, Central Office Trivandrum,	Kerala	Best Religious/ Recreational & Tourism water Users(3 rd)
76	Steel Authority of India (SAIL), Bokoro	New Delhi	Best Industry for Industrial Water Conservation(1 st)
77	Orient Paper Mills, Amlai,	Madhya Pradesh	Best Industry for Industrial Water Conservation(2 nd)
78	Honda Motorcycle and Scooter India PVT. LTD. Ahmednagar,	Gujarat	Best Industry for Industrial Water Conservation(3 rd)

79	KGFL, Erode,	Tamil Nadu	Medium & Small Scale Industry(1 st)
80	LSC Infratech Limited, Rudrapur, U.S.Nagr	Uttrakhand	Medium & Small Scale Industry(2 nd)
81	DB Builders and Envi.Engineers, Mahannada	Madhya Pradesh	Medium & Small Scale Industry(3 rd)
82	Maharashtra Water Resources Regulatory Authority, Pune,	Maharashtra	Best Water Regulatory Authority(1 st)

Name of Ministry/Department-Ministry of Jal Shakti

Depart of Water Resources, RD & GR

Year-2020 (2nd National Water Awards, 2019)

Sl. No.	Name of Awardee	State	Category(if applicable)
BEST STATE			
NORMAL CATEGORY			
1.	Tamil Nadu	Tamil Nadu	Best State (Award prize 1 st)
2.	Maharashtra	Maharashtra	Best State(Award prize 2 nd)
3.	Rajsathan	Rajsathan	Best State (Award prize 3 rd)
SPECIAL CATEGORY			
4.	Mizoram	Mizoram	Best State (Award prize 1 st)
BEST DISTRICT			
NORTH			
REVIVAL OF RIVER			
5.	Ayodhya Dist,Uttar Pradesh	Ayodhya Dist,Uttar Pradesh	Best District North (Award prize 1 st)
6.	Kasganj Dist, Uttar Pradesh	Kasganj Dist, Uttar Pradesh	Best District North (Award prize 2 nd)
7.	Mirzapur Dist, Uttar Pradesh	Mirzapur Dist, Uttar Pradesh	Best District (Award prize 3 rd)
WATER CONSERVATION			
8.	Almora Dist, Uttarakhand	Almora Dist, Uttarakhand	Best District (Award prize 1 st)
9.	Hardoi Dist, Uttar Pradesh	Hardoi Dist, Uttar Pradesh	Best District (Award prize 2 nd)
10.	Udhampur, J&K	Udhampur, J&K	Best District (Award prize 3 rd)
11.	Sangrur Dist, Punjab	Sangrur Dist, Punjab	Best District (Award prize Special)
SOUTH			
REVIVAL OF RIVER			
12.	Vellore District, Tamil Nadu	Vellore District, Tamil Nadu	Best District (Award prize 1 st)
13.	Karur Dist, Tamil Nadu	Karur Dist, Tamil Nadu	Best District (Award prize 3 rd)
WATER CONSERVATION			
14.	YSR Kadapa dist, Andhra Pradesh	YSR Kadapa dist, Andhra Pradesh	Best District (Award prize 1 st)
15.	Perambalur dist, Tamilnadu	Perambalur dist, Tamilnadu	Best District (Award prize 2 nd)
16.	Vikarabad District, Telangan	Vikarabad District, Telangan	Best District (Award prize 3 rd)
WEST			
REVIVAL OF RIVER			
17.	Sangli Maharashtra	Sangli Maharashtra	Best District (Award prize 1 st)
18.	Bharauch Gujarat	Bharauch Gujarat	Best District (Award prize 2 nd)

19.	Neemuch M P	Neemuch MP	Best District (Award prize 3 rd)
WATER CONSERVATION			
20.	Kachchh Dist, Gujarat	Kachchh Dist, Gujarat	Best District (Award prize 1 st)
21.	Agar-Malwa, Madhya Pradesh	Agar-Malwa, Madhya Pradesh	Best District (Award prize 2 nd)
22.	Sagar Dist, MP	Sagar Dist, MP	Best District (Award prize 3 rd)
EAST			
REVIVAL OF RIVER			
23.	Bilaspur Dist, Chhattishgarh	Bilaspur Dist, Chhattishgarh	Best District (Award prize 1 st)
WATER CONSERVATION			
24.	Surajpur dist, Chhattisgarh	Surajpur dist, Chhattisgarh	Best District(Award prize 1 st)
25.	Dumka dist, Jharkhand	Dumka dist, Jharkhand	Best District (Award prize 2 nd)
26.	Bhojpur District, Bihar	Bhojpur District, Bihar	Best District(Award prize 3 rd)
NORTH EAST			
REVIVAL OF RIVER			
27.	West Tripura dist	West Tripura dist	Best District (Award prize 1 st)
28.	West Khasi Hills, Nongstoin	West Khasi Hills, Nongstoin	Best District (Award prize 2 nd)
29.	Goalpara dist, Assam	Goalpara dist, Assam	Best District (Awarded prize 3 rd)
ASPIRATIONAL DISTRICT			
REVIVAL OF RIVER			
30.	Khandwa dist, MP	Khandwa dist, MP	Best District (Award prize 1 st)
31.	Baran Rajasathan	Baran Rajasathan	Best District (Award prize 2 nd)
WATER CONSERVATION			
32.	Vizianagaram dist, AP	Vizianagaram dist, AP	
33.	Godda Dist, Jharkhand	Godda Dist, Jharkhand	Best District (Award prize 2 nd)
34.	Banka dist, Bihar	Banka dist, Bihar	Best District (Award prize 3 rd)
BEST VILLAGE PANCHAYAT			
NORTH			
35.	Chirbatiya Luthiyag GP, Rudraprayag dist Uttarakhand	Chirbatiya Luthiyag GP, Rudraprayag dist Uttarakhand	Best Village Panchayat (Award prize 1 st)
36.	Rampur Village Panchayat	Rampur Village Panchayat	Best Village Panchayat (Award prize 2 nd)
37.	GP Sour, Solan Dist, HP	GP Sour, Solan Dist, HP	Best Village Panchayat (Award prize 3 rd)
SOUTH			

38.	Sasthavinathur Village Panchayat, Thoothukudi dist	Sasthavinathur Village Panchayat, Thoothukudi dist	Best Village Panchayat (Award prize 1 st)
39.	Vajjapally Village Gram Panchayat, Kamareddy, Telengana	Vajjapally Village Gram Panchayat, kamareddy Telengana	Best Village Panchayat (Award prize 2 nd)
40.	Jojna,Bidar Karnataka	Jojna,Bidar Karnataka	Best Village Panchayat (Award prize 3 rd)
WEST			
41.	Pipariya Gopal GP, Sagar dist, Madhya Pradesh	Pipariya Gopal GP, Sagar dist, Madhya Pradesh	Best Village Panchayat (Award prize 1 st)
42.	Anore VP, Jalgaon dist, Maharashtra	Anore VP, Jalgaon dist, Maharashtra	Best Village Panchayat(Award prize 2 nd)
43.	Balachod Moti and Balachod Nani Gujarat	Balachod Moti and Balachod Nani Gujarat	Best Village Panchayat(Award prize 3 rd)
EAST			
44.	Gopalganj Panchayat, South 24paraganas dist, West Bengal	Gopalganj Panchayat, South 24paraganas dist, West Bengal	Best Village Panchayat(Award prize 1 st)
45.	Ara-Keram GP, Ranchi dist, Jharkhand	Ara-Keram GP, Ranchi dist, Jharkhand	Best Village Panchayat(Award prize 2 nd)
NORTH EAST			
46.	Leng Village, Mizoram	Leng Village, Mizoram	Best Village Panchayat (Award prize 1 st)
47.	Ailwang village, Mamit Dist, Mizoram	Ailwang village, Mamit Dist, Mizoram	Best Village Panchayat(Award prize 2 nd)
48.	Port Blair MC, A&N Islands	Port Blair MC, A&N Islands	Best Urban Local Body(Award prize 1 st)
49.	Madurai Municipal Corporation Madurai, Tamil nadu	Madurai Municipal Corporation Madurai, Tamil nadu	Best Urban Local Body(Award prize 2 nd)
50.	Singrauli Municipal Corporation, Madhya Pradesh.	Singrauli Municipal Corporation, Madhya Pradesh.	Best Urban Local Body(Award prize 3 rd)

51.	Hari Kuppaswamy, ICAR- Sugarcane Breeding Institute, Coimbatore , Tamil Nadu	Hari Kuppaswamy, ICAR- Sugarcane Breeding Institute, Coimbatore , Tamil Nadu	Best Research / Innovation/ adpatation of New Technologyfor Water Conservation (Award prize 1 st)
52.	T Pradeep, IIT Chennai	T Pradeep, IIT Chennai	Best Research / Innovation/ adpatation of New Technologyfor Water Conservation (Award prize 2 nd)
53.	Va Tech WabadLtd, Sunnambu Kolathur, Chennai, Tamilnadu	Va Tech WabadLtd, Sunnambu Kolathur, Chennai, Tamilnadu	Best Research / Innovation/ adpatation of New Technologyfor Water Conservation (Award prize 3 rd)
54.	Narender Kumar Yadav	Narender Kumar Yadav	Best Education/Mass Awareness efforts(Award prize 1 st)
55.	Mahendraa Modi, GM NagaerExtn, Lucknow Dist, U.P	Mahendraa Modi, GM NagaerExtn, Lucknow Dist, U.P	Mahendraa Modi, GM NagaerExtn, Lucknow Dist, U.P (Award prize 2 nd)
56.	Vattatha Uravaykkay Jalasamarudhi, Kerala StateLand Use Board, Thiruvananthapura m Kerala	Vattatha Uravaykkay Jalasamarudhi, Kerala StateLand Use Board, Thiruvananthapura m Kerala	Mahendraa Modi, GM NagaerExtn, Lucknow Dist, U.P (Award prize 3 rd)
57.	Jal Shakti Samachar, DD News,New Delhi	Jal Shakti Samachar, DD News,New Delhi	Best TV Show for promotingWater Conservation(Award prize 1 st)
58.	Aakhri Boond- ITV, Noida Uttar Pradesh	Aakhri Boond- ITV, Noida Uttar Pradesh	Best TV Show for promotingWater Conservation(Award prize 2 nd)
59.	Daini Bhaskar Indore, M.P	Daini Bhaskar Indore, M.P	Best Newspaper(Award prize 1 st)
60.	Dainik Jagran Merrut, UP	Dainik Jagran Merrut, UP	Best Newspaper(Award prize 2 nd)
61.	Advance Water Digest Ltd	Advance Water Digest Ltd	Best Newspaper(Award prize 1 st)

62.	Kutchmitra Daily New paper (Gujarati), Bhuj, Kachchh	Kutchmitra Daily New paper (Gujarati), Bhuj, Kachchh	Best Newspaper(Award prize 1 st)
63.	Dainik Navarahtra (Marati) Pune Maharashtra.	Dainik Navarahtra (Marati) Pune Maharashtra.	Best Newspaper(Award prize 2 nd)
64.	Indira Gandhi Government High School, Katterikupam, Puducherry	Indira Gandhi Government High School, Katterikupam, Puducherry	Best School(Award prize 1 st)
65.	SPS Govt.Sr.Sec.School (Boys), Gill, Ludhiana, Punjab	SPS Govt.Sr.Sec.School (Boys), Gill, Ludhiana, Punjab	Best School(Award prize 2 nd)
66.	NPS International School, Guwahati, Assam	NPS International School, Guwahati, Assam	Best School(Award prize 3 rd)
67.	Shree Matha Vaishno Devi Shrine Board, Jammu	Shree Matha Vaishno Devi Shrine Board, Jammu	Best Institution/ Resident Welfare Association (RWA) Religious Organization for Successful Campus Usage(Award prize 1 st)
68.	Sri Sri Thakur Anukulchandra Ashram, SATSANG, Deoghar dist, Jharkhand.	Sri Sri Thakur Anukulchandra Ashram, SATSANG, Deoghar dist, Jharkhand.	Best Institution/ Resident Welfare Association (RWA) Religious Organization for Successful Campus Usage(Award prize 1 st)
69.	Krishi Vigyan Kendra, Cooch Behar, Pundibari, Cooch Behar, West Bengal	Krishi Vigyan Kendra, Cooch Behar, Pundibari, Cooch Behar, West Bengal	Best Institution/ Resident Welfare Association (RWA) Religious Organization for Successful Campus Usage (Award prize 2 nd)
70.	Hassan Institute of Medical Sciences(HIMS), Hassan	Hassan Institute of Medical Sciences(HIMS), Hassan	Best Institution/ Resident Welfare Association (RWA) Religious Organization for Successful Campus Usage(Award prize 3 rd)
71.	Honda Motorcycle & Scooter India Pvt Ltd, Kasaba hobli, Kolar dist, Karnataka	Honda Motorcycle & Scooter India Pvt Ltd, Kasaba hobli, Kolar dist, Karnataka	Best Industry for Industrial Water Conservation(Award prize 1 st)

72.	Arvind Ltd, Santej Unit,Gandhinagar, Gujarat	Arvind Ltd, Santej Unit,Gandhinagar, Gujarat	Best Industry for IndustrialWater Conservation(Award prize 2 nd)
73.	Delhi International Airport LTD,Delhi	Delhi International Airport LTD,Delhi	Best Industry for IndustrialWater Conservation(Award prize 3 rd)
74.	New Swan Enterprises Unit-6, Ludhiana, Punjab	New Swan Enterprises Unit-6, Ludhiana, Punjab	Best Industry for IndustrialWater Conservation(Award prize 1 st)
75.	IPCA Laboratories Ltd, Indore,Madhya Pradesh	IPCA Laboratories Ltd, Indore,Madhya Pradesh	Best Industry for IndustrialWater Conservation(Award prize 2 nd)
76.	Maharashtra Water ResourcesRegulatory Authority	Maharashtra Water Resources Regulatory Authority	Best Water Regulatory Authority (Award prize 1 st)
77.	Aman Jain, Sarita Vihar, NewDelhi	Aman Jain, Sarita Vihar, NewDelhi	Best Water Warriar(Award prize 1 st)
78.	Umashankar Pandey	Umashankar Pandey	Best Water Warriar(Award prize 2 nd)
79.	Raman Kant Tyagi (Neer Foundation) Meerut, UttarPradesh	Raman Kant Tyagi (Neer Foundation) Meerut, Uttar Pradesh	Best Water Warriar(Award prize 3 rd)
80.	S.K.Singh, Jan Jagrithi Kendra Hazaribagh, Jharkhand	S.K.Singh, Jan Jagrithi Kendra Hazaribagh, Jharkhand	Best Water Warriar (Award prize 1 st)
81.	Shravan Kumar Rathore, Raipur, Chhattishgarh	Shravan Kumar Rathore, Raipur, Chhattishgarh	Best Water Warriar(Award prize 2 nd)
82.	Pankaj Chhaganbhai Lakhani andGroup	Pankaj Chhaganbhai Lakhani andGroup	Best Water Warriar(Award prize 1 st)
83.	Aniket Dwarkadas Lohiya,Ambajogai, Beed Dist, Maharshtia	Aniket Dwarkadas Lohiya,Ambajogai, Beed Dist, Maharshtia	Best Water Warriar (Award prize 2 nd)
84.	Rajnish Sharma, Jakhalamoha, Rajasthan	Rajnish Sharma, Jakhalamoha, Rajasthan	Best Water Warriar(Award prize 3 rd)

85.	Sh.Manikandan Co-ordinator, Kovai Kulangal Pathukappu Amaippu, Coimbatore, TamilNadu	Sh.Manikandan Co-ordinator, Kovai Kulangal Pathukappu Amaippu, Coimbatore, TamilNadu	Best Water Warriar(Award prize 1 st)
86.	Prof. Sakthinathan Ganapathy Pandian, CWG Campus, Anna University, Tamil nadu	Prof. Sakthinathan Ganapathy Pandian, CWG Campus, Anna University, Tamil nadu	Best Water Warriar(Award prize 2 nd)
87.	Shaji Joseph, Trivandrum, Kerala	Shaji Joseph, Trivandrum, Kerala	Best Water Warriar(Award prize 3 rd)
88.	Handfree Washing & Others	Handfree Washing & Others	Best Water Warriar(Award prize 1 st)
89.	Sh.Akshay Aharwal, Assam	Sh.Akshay Aharwal, Assam	Best Water Warriar(Award prize 2 nd)
90.	Gram Vikas Navyuvak Mandal, Laporiya(GVNM L), Jaipur,	Gram Vikas Navyuvak Mandal, Laporiya(GVN ML), Jaipur,	Best NGO for Water Conservation (Award prize 1 st)
91.	Agha Khan Rural Support Programme, Ahmedabad, Gujarat	Agha Khan Rural Support Programme, Ahmedabad, Gujarat	Best NGO for Water Conservation(Awar d prize 2 nd)
92.	SM.Sehgal Foundation, Gurugram, Haryana	SM.Sehgal Foundation, Gurugram, Haryana	Best NGO for Water Conservation(Awar d prize 3 rd)
93.	Sharad Pani Wapar Thibak Sinchan Sahakari Society	Sharad Pani Wapar Thibak Sinchan Sahakari Society	Best Water User Association(Award prize 1 st)
94.	Waghad Project Level WUA, Dindori, Nashik dist, Maharashtra	Waghad Project Level WUA, Dindori, Nashik dist, Maharashtra	Best Water User Association(Award prize 2 nd)

95.	Durlavpur MDTW Water Users' Association, North 24 Parganas dist, West Bengal	Durlavpur MDTW Water Users' Association, North 24 Parganas dist, West Bengal	Best Water User Association(Award prize 3 rd)
96.	Lalitpur Power Generation Ltd,Mirchwara Buragaon , Lalitpur dist, U.P	Lalitpur Power Generation Ltd,Mirchwara Buragaon , Lalitpur dist, U.P	Best Industry for CSR Activity(Award prize 1 st)
97.	Adani Ports and Special Economics Zone Ltd, Mundra, Kutch, Gujarat	Adani Ports and Special Economics Zone Ltd, Mundra,Kutch, Gujarat	Best Industry for CSR Activity(Award prize 2 nd)
98.	Ambuja Cement Foundation, Kodinar, Gir Somnath dist, Gujarat	Ambuja Cement Foundation, Kodinar, Gir Somnath dist, Gujarat	Best Industry for CSR Activity(Award prize 3 rd)

Name of Ministry/Department-Ministry of Jal Shakti

Depart of Water Resources, RD & GR

Year-2022 (3rd National Water Awards,2020)

Sl. No.	Name of Awardee	State	Category (if applicable)
1.	Uttar pradesh	Uttar pradesh	" Best state"(Rank) 1 st
2.	Rajasthan	Rajasthan	" Best state(Rank) 2 nd
3.	Tamil Nadu	Tamil Nadu	" Best state "
Best District Category-North Zone			
4.	Muzaffarnagar , Uttar Pradesh	Muzaffarnagar , Uttar Pradesh	"Best District" Category-North Zone (Rank)1 st
5.	Shahid Bhagat Singh Nagar, punjab	Shahid Bhagat Singh Nagar, punjab	"Best District" Category-North Zone (Rank) 2 nd
South Zone			
6 .	Thiruvananthapuram, Kerala	Thiruvananthapuram, Kerala	"Best District" Category- South Zone (Rank) 1 st
7.	Kadapa, Andhra Pradesh	Kadapa, Andhra Pradesh	"Best District" Category- South Zone
East Zone			
8.	East Champaran , Bihar	East Champaran , Bihar	"Best District"
9.	Godda , Jharkhand	Godda , Jharkhand	"Best District"
West Zone			
10.	Indore, Madhya Pradesh	Indore, Madhya Pradesh	"Best District" Category-
11.	Vadodara, Gujarat	Vadodara, Gujarat	"Best District" Category-
12.	Banswara , Rajasthan	Banswara , Rajasthan	District" Category-
North East zone			
13.	Goalpara , Assam	Goalpara , Assam	"Best District"Category
14.	Siang , Arunachal Pradesh	Siang , Arunachal Pradesh	"Best District"Category _ North _ East zone (Rank) 2nd
North Zone			
15.	Dhaspad, Almora, Uttarakhand	Dhaspad, Almora, Uttarakhand	" Best village panchayat" Category _ North
16.	Jamola, Rajouri ,J&K	Jamola, Rajouri ,J&K	" Best village panchayat" Category _ North
17.	Balua, Varanasi , Uttar Pradesh	Balua, Varanasi , Uttar Pradesh	" Best village panchayat" Category _ North Zone (Rank) 3 rd
South Zone			
18.	Yelerampura Panchayat, Tumakuru District karnataka	Yelerampura Panchayat, Tumakuru District karnataka	" Best village panchayat" Category _ South Zone (Rank) 1st
19.	Vellaputhur Panchayat Chengalpattu District, Tamil Nadu	Vellaputhur Panchayat Chengalpattu District, Tamil Nadu	" Best village panchayat" Category _ South Zone (Rank) 2 nd
20.	Elappully Grama Panchayat, Palakkad District Kerala	Elappully Grama Panchayat, Palakkad District Kerala	" Best village panchayat" Category _ South Zone (Rank) 3rd

East Zone			
21.	Telari Panchayat, District , Bihar	Telari Panchayat, District , Bihar	“ Best village panchayat” Category _ East zone (Rank)1 st
22.	Chhindiya Panchayat, Surajpur District, Chhattisgarh	Chhindiya Panchayat, Surajpur District, Chhattisgarh	“ Best village panchayat” Category _ East zone (Rank)2 nd
23.	Guni panchayat,Khunti District, Jharkhand	Chhindiya Panchayat, Surajpur District, Chhattisgarh	“ Best village panchayat” Category _ East zone (Rank)3 rd
West Zone			
24.	Takhatgadh, Sabarkantha, Gujarat	Takhatgadh, Sabarkantha, Gujarat	“ Best Village Panchayat” Category – West Zone (Rank)
25.	Kankapar , Kachchh, Gujarat	Kankapar , Kachchh, Gujarat	“ Best Village Panchayat” Category – West Zone (Rank)
26.	Surdi, Solapur, Maharashtra	Surdi, Solapur, Maharashtra	“ Best Village Panchayat” Category – West Zone (Rank)
North – East - Zone			
27.	Sialsir, Sirchip, Mizoram	Sialsir, Sirchip, Mizoram	“ Best village panchayat” Category- North
28.	Aminda Simsanggre , West Garo Hills , Meghalaya	Aminda Simsanggre , West Garo Hills , Meghalaya	“ Best village panchayat” Category- North – East - Zone (Rank) 2 nd
29.	Chambagre, West Garo Hills , Meghalaya	Chambagre, West Garo Hills , Meghalaya	“ Best village panchayat” Category- North – East - Zone
30.	Vapi Urban Local Body , Gujarat	Vapi Urban Local Body , Gujarat	“ Best Urban Local Body” Category (Rank) 1 st
31.	Dapoli Nagar Panchayat, Maharashtra	Dapoli Nagar Panchayat, Maharashtra	“ Best Urban Local Body” Category (Rank) 2 nd
32.	Madurai Municipal Corporation, Tamil Nadu	Madurai Municipal Corporation, Tamil Nadu	“ Best Urban Local Body” Category (Rank) 3 rd
33.	Mission Panni (Network 18)	Mission Panni (Network 18)	“ Best Media (print & Electronic)” Category (Rank)
34.	Agrowon , Sakal Media Pvt.(Adinath Dattatray Chavan)	Agrowon , Sakal Media Pvt. (Adinath Dattatray Chavan)	“ Best Media (print & Electronic)” Category (Rank) 2 nd
35.	Sandesh Daily Bhuj Edition	Sandesh Daily Bhuj Edition	“ Best Media (print & Electronic)” Category (Rank)
36.	Govt . Girls Hr. Secondary School ,kaveripattinam, Tamilnadu	Govt . Girls Hr. Secondary School ,kaveripattinam, Tamilnadu	“ Best School ” Category (Rank) 1 st
37.	Amalorpavam Lourds Academy , Thiruvalluar	Amalorpavam Lourds Academy , Thiruvalluar	“ Best School ” Category (Rank) 2 nd
38.	Amity International School , Noida UP	Amity International School , Noida UP	“ Best School ” Category (Rank) 3 rd (joint Winner)

39.	Govt Middle school , Manapet, Puducherry	Govt Middle school , Manapet, Puducherry	" Best School " Category (Rank) 3 rd (joint Winner)
40.	Mata Vaishno Devi Shrine Board , Jammu	Mata Vaishno Devi Shrine Board , Jammu	" Best Institution /RWA/ Religious Organization for Campus usage" Category
41.	IIT Gandhinagar, Gujarat	IIT Gandhinagar, Gujarat	" Best
42.	Indian Oil Corporation Limited Faridabad	Indian Oil Corporation Limited Faridabad	" Best Institution /RWA/ Religious Organization
43.	Welspun India Textile Ltd.,	Welspun India Textile Ltd.,	" Best Industry " Category (Rank)1 st
44.	Hyundai Motor India LTD .,	Hyundai Motor India LTD .,	" Best Industry " Category(Rank)2 nd
45.	Trident (Textile) Ltd., Punjab	Trident (Textile) Ltd., Punjab	" Best Industry " Category(Rank)3 rd (Joint Winner)
46.	Steel Authority of India Ltd., NEW Delhi	Steel Authority of India Ltd., NEW Delhi	" Best Industry " Category(Rank)3 rd (Joint Winner)
47.	Coastal Salinity prevention cell , Ahmedabad	Coastal Salinity prevention cell , Ahmedabad	" Best NGO " Category (Rank)1 st
48.	Vivekananda Kendra NARDEP , Kanyakumari	Vivekananda Kendra NARDEP , Kanyakumari	" Best NGO " Category (Rank)2 nd
49.	Gramvikas Sanstha , Aurangabad	Gramvikas Sanstha , Aurangabad	" Best NGO " Category (Rank)3 rd (Joint Winner)
50.	Vivekananda Research and Training Institute , Bhavnagar	Vivekananda Research and Training Institute , Bhavnagar	" Best NGO " Category (Rank)3 rd (Joint Winner)
51.	Panchgachiya MDTW WUA , Hooghly, West Bengal	Panchgachiya MDTW WUA , Hooghly, West Bengal	" Best Water User Association" Category (Rank)1 st
52.	Hatinada Champa purulia , West Bengal	Hatinada Champa purulia , West Bengal	" Best Water User Association" Category (Rank)2 nd
53.	Amtore Mini River Lift Irrigation WUA ,Purulia , West Bengal	Amtore Mini River Lift Irrigation WUA ,Purulia , West Bengal	" Best Water User Association" Category (Rank)3 rd
54.	ITC Limited , Kolkata , West Bengal	ITC Limited , Kolkata , West Bengal	" Best Industry for CSR activities " Category (Rank)1 st
55.	Adani Foundation , Gujarat	Adani Foundation , Gujarat	" Best Industry for CSR activities " Category (Rank)2 nd
56.	HAL, Bengaluru , Karnataka	HAL, Bengaluru , Karnataka	" Best Industry for CSR activities " Category (Rank)3 rd (joint Winner)
57.	Dharampal Satyapal Ltd., Noida , Uttar pradesh	Dharampal Satyapal Ltd., Noida , Uttar pradesh	" Best Industry for CSR activities " Category (Rank)3 rd (joint Winner)

Sl. No.	Name of Awardee	State	Category (if applicable)
1.	Madhya Pradesh	Madhya Pradesh	Best State (Rank 1 st)
2.	Odisha	Odisha	Best State (Rank 2 nd)
3.	Andhra Pradesh	Andhra Pradesh	Best State (Rank 3 rd Joint Winner)
4.	Bihar	Bihar	Best State (Rank 3 rd Joint Winner)
5.	Ganjam, Odisha	Odisha	Best District (Rank 1 st)
6.	Namakkal, Tamil Nadu	Tamil Nadu	Best District (Rank 2 nd)
7.	Adilabad, Telangana	Telangana	Best District (Rank 3 rd)
8.	Jagannadhapuram Village Panchayat	Telangana	Best Village Panchayat (Rank 1 st)
9.	Kadavur Village Panchayat	Tamil Nadu	Best Village Panchayat (Rank 2 nd Joint Winner)
10.	Manickal Village Panchayat	Kerala	Best Village Panchayat (Rank 2 nd Joint Winner)
11.	Kadegaon Village Panchayat	Maharashtra	Best Village Panchayat (3 rd Joint Winner)
12.	Mawkyrdep Village Panchayat	Meghalaya	Best Village Panchayat (3 rd Joint Winner)
13.	Chandigarh Municipal Corporation	Chandigarh	Best Urban Local Body (Rank 1 st)
14.	Indore Municipal Corporation	Madhya Pradesh	Best Urban Local Body (Rank 2 nd)
15.	Surat Municipal Corporation Surat	Gujarat	Best Urban Local Body (Rank 3 rd Joint Winner)
16.	Malkapur Municipal Council Karad Satara	Maharashtra	Best Urban Local Body (Rank 3 rd Joint Winner)
17.	Advance Water Digest Private Limited Gurugram	Haryana	Best Media (Rank 1 st)
18.	Centre For Environment And Sustainable Development Srinagar	Jammu & Kashmir	Best Media (Rank 2 nd Joint Winner)
19.	Regional News Unit All India Radio Guwahati	Assam	Best Media (Rank 2 nd Joint Winner)
20.	Network Eighteen Gautam Buddh Nagar	Uttar Pradesh	Best Media (Rank 3 rd)
21.	Jamiyatpura Primary School Mehsana	Gujarat	Best School (Rank 1 st)
22.	KGBV School Chagalamarri Nandyal	Andhra Pradesh	Best School (Rank 2 nd)
23.	Government Senior Secondary School (GSSS), Baori,	Rajasthan	Best School (Rank 3 rd)
24.	Shri Mata Vaishno Devi Shrine Board	Jammu and Kashmir	Best Institution for Campus usage (Rank 1 st)
25.	Maulana Azad National Urdu University	Telangana	Best Institution for Campus usage (Rank 2 nd)
26.	Central University of Punjab	Punjab	Best Institution for Campus usage (Rank 3 rd)
27.	Barauni Thermal Power Station	Bihar	Best Industry (Rank 1 st)
28.	Honda Motor cycle And Scooter India Pvt Ltd Kolar,	Karnataka	Best Industry (Rank 2 nd)
29.	Apollo Tyres Limited Kanchipuram	Tamil Nadu	Best Industry (Rank 3 rd Joint Winner)

30.	CCL Products India Ltd, Tirupati	Andhra Pradesh	Best Industry (Rank 3 rd Joint Winner)
31.	Arpan Seva Sansthan Udaipur	Rajasthan	Best NGO (Rank 1 st)
32.	AROH Foundation NOIDA	Uttar Pradesh	Best NGO (Rank 2 nd)
33.	Bharatiya Jain Sanghatana Pune	Maharashtra	Best NGO (Rank 3 rd)
34.	Accion Fraterna Anantapur	Andhra Pradesh	Best NGO (Special Mention Consolation)
35.	The Sanjeevani Piyat Sahkari Mndli Ltd Narmada	Gujarat	Best Water User Association (Rank 1 st)
36.	Water User Association Nine Y-II Ganganagar	Rajasthan	Best Water User Association (Rank 2 nd Joint Winner)
37.	Hatuka Vibhag Piyat Mandali Ltd,Tapi	Gujarat	Best Water User Association (Rank 2 nd Joint Winner)
38.	Keliya Jamnakantha Nehroni Sahkari Mandali Ltd., Ambach Navsari	Gujarat	Best Water User Association (Rank 3 rd)
39.	HCL Technologies Ltd, Noida	Uttar Pradesh	Best industry for CSR (Rank 1 st)
40.	Coca Cola India, Gurugram	Haryana	Best industry for CSR (Rank 2 nd)
41.	GHCL Limited Gir Somnath	Gujarat	Best industry for CSR (Rank 3 rd)

U.P. SINGH

सचिव

SECRETARY

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सत्यमेव जयते

जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
श्रम शक्ति भवन
राफी मार्ग, नई दिल्ली-110 001

GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION
SHRAM SHAKTI BHAWAN
RAFI MARG, NEW DELHI-110 001
<http://www.mowr.gov.in>

D.O. No. T-63012/1/2020-GW

4th January, 2021

Dear

I am writing to you to strengthen the institutional mechanism in your State to ensure sustainable management of ground water.

Ground water has been the lifeline for drinking and domestic water needs in most parts of the country. It also has the largest share (around 67%) in providing irrigation for agriculture and food production. However, the indiscriminate extraction of ground water has led to significant depletion in ground water resources in many parts of the country, which is a cause of grave concern.

The ground water resources assessment of the country, carried out jointly by Central Ground Water Board and State Ground Water organizations (as on 2017) indicates that, out of the total of 6881 assessment units (Block/ Taluks/ Mandals/ watershed/ Firkka), 1186 units (17%) have been categorized as 'Over-exploited', 313 as 'Critical', 972 as 'Semi-critical', 4310 as 'Safe' and 100 as 'Saline' in the country.

To make matters worse, unplanned sewage disposal, excessive application of chemical fertilizers, and discharge of untreated industrial effluents have contaminated the ground water resource in several parts of the country. It is the need of the hour to take adequate steps against excess extraction of groundwater and contamination to ensure long term sustainability of fresh ground water resources.

Water is a State subject. It is, therefore, essential that every State constitutes an independent, well equipped State Ground Water Department (SGWD) (wherever not constituted till date) with adequate technical and administrative support. States will also need to constitute a State Ground Water Authority (SGWA) (wherever not existing) for effective regulation of groundwater extraction.

This Ministry has recently notified the groundwater guidelines for control and regulation of groundwater extraction vide notification dated 24th September, 2020 which must be implemented immediately by the States/UTs for sustainability of this precious resource. It will not be out of place to mention here that wherever the SGWD and SGWA are existing they may be empowered with posting of adequate number of officials and may be delegated adequate financial/administrative powers for their effective functioning.

Contd...2/-

-: 2 :-

In a recent meeting of the Committee of Secretaries chaired by Cabinet Secretary, the Committee recommended that States/UTs should have their own (Ground Water) Boards and Regulations for ground water extraction in-place, within the overall ambit of the Government of India guidelines.

It is, therefore, requested that you may kindly look into the matter for urgent appropriate action. A line of confirmation in this regard with timelines shall be highly appreciated.

With best wishes.

Yours sincerely,


(U. P. Singh)



To

Chief Secretaries/Administrator (As per attached list)



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected *Sasidhar Ji*,

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

More recently, Hon'ble National Green Tribunal, New Delhi vide Order dated 25.02.2022 in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) has held that:-

Para 105

“The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986....”

Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

“....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment....”

Para 117

“....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country....”

Para 237

“....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder....”

Para 244

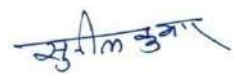
“....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water....”

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Shri. Kona Sasidhar, IAS,
Commissioner,
PR & RD & Administrator, APWALTA,
D. No. 12-47, PVS Empire, Pathuru Road,
Besides Reliance Digitals, Tadepalli,
Guntur District, Andhra Pradesh

Copy to: The Chief Secretary, Government of Andhra Pradesh, 1st Block, 1st Floor, Interim Government Complex, A.P Secretariat Office, Velagapudi- 522503



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected [Badami Ji](#),

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

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“The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986....”

Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

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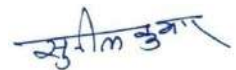
"....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Sh. Pramod Badami,
Water Resource Department,
Sinchai Bhawan,
Near Police Station,
Porvorim, Goa -403501

Copy to: The Chief Secretary, Government of Goa, Secretariat, Porvorim, Bardez-403521.



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
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केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected [Kaul Ji](#),

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

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“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

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"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

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"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

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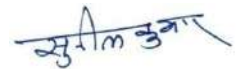
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With regards,

Yours sincerely



(Sunil Kumar)

To
Er.Sanjeev Kaul,
Engineer-in-Chief, Jal Shakti Vibhag,
Government of Himachal Pradesh,
Jal shakti Bhawan
Shimla-171005

Copy to: The Chief Secretary, Government of Himachal Pradesh, Department of Personnel, H.P. Secretariat, Shimla-171002.



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
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केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected *Jha Ji*,

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The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

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“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

“....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment....”

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“....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country....”

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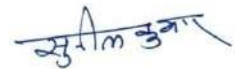
“....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water....”

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

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With regards,

Yours sincerely



(Sunil Kumar)

To
Sh. Ghanshyam Jha,
Chairperson, Jammu & Kashmir Water Resources Regulatory Authority,
Government of Jammu & Kashmir,
Ashok Nagar, Satwari ,
Jammu - 180004

Copy to: The Chief Secretary, R. No. 2/7, 2nd, Floor Main Building, Civil Secretariat, Jammu – 180001.



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected Ramachandraiah Ji,

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2. The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

3. Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

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“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

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"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country...."

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"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

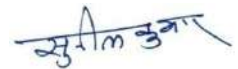
"....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To,
Sh. B. G. Ramachandraiah,
Government of Karnataka,
O/o director, Ground Water Directorate
2nd Floor, KSFC Bhawan,
#1/1, Thimmiah Road,
Bengaluru-560052

Copy to: The Chief Secretary, Room No. 320, 3rdfloor, Vidhanasoudha, Bangalore-560001.

434
68394/2023/O/o RD(CGWA)

अध्यक्ष

Sunil Kumar
Chairman



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected *Singh Ji*,

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

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“The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986....”

Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

“....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment....”

Para 117

“....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country....”

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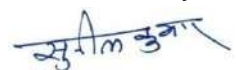
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From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Shri. Ashok Kumar Singh, IAS
Secretary, Water Resource Department,
Government of Kerala,
Room No. 393, 1st Floor,
Main Block, Secretariat,
Thiruvananthapuram-695001

Copy to: The Chief Secretary, Government Secretariat, Government of Kerala, Thiruvananthapuram, Kerala, PIN – 695001



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

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2. The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

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“....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment....”

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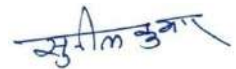
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With regards,

Yours sincerely



(Sunil Kumar)

To
Sh. Anil Kumar Singh,
Special Secretary (Env&Forest),
Government of NCT of Delhi,
Environment Department, 6th Level, C-Wing,
IP Estate, Delhi Secretariat,
Delhi-110002

Copy to: The Chief Secretary, Government of NCT of Delhi, 3rd Delhi Secretariat, IP Estate, New Delhi, Delhi 110002.



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected [Prabakaran Ji](#),

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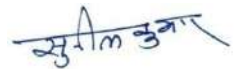
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With regards,

Yours sincerely



(Sunil Kumar)

To
Sh.S. Prabakaran,
Chief Engineer,
Government of Tamil Nadu,
Public Works Department, Water Resources Department,
State Ground Water & Surface
Water Resources Data Center, Taramani,
Chennai-600113

Copy to: The Chief Secretary, Shankar Rd, Fort St George, Tamil Nadu 600009.



भारत सरकार
जल शक्ति मंत्रालय
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Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

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Respected [Sharath Ji](#),

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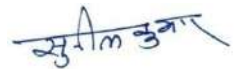
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With regards,

Yours sincerely



(Sunil Kumar)

To
Dr. A. Sharath, IAS
Commissioner, Government of Telangana
PR & RD & Administrator, TSWALTA,
Panchayath Raj Building, Urdu Hall Lane, Himayath Nagar,
Hyderabad -500029

Copy to: The Chief Secretary, 5th Floor, Burgula Rama Krishna Rao Bhavan, NH 44, Hill Fort, Adarsh Nagar, Hyderabad, Telangana 500063.



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected *Ghosh Ji*,

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

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Para 105

“The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986....”

Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

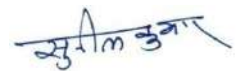
"....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Shri Arindam Ghosh,
Director, SWID, Government of West Bengal,
Nirman Bhawan, 1st Floor, Salt Lake, Sector-III,
Kolkata - 700091

Copy to: The Chief Secretary, Nabanna (13th Floor), 325, Sarat Chatterjee Road, Shibpur, Howrah-711102.



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D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

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Respected [Anindita Ji](#),

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

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Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

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"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

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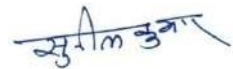
"....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Smt. Anindita Mitra,
Commissioner,
Government of Chandigarh
Municipal Cooperation, Sector-17,
Chandigarh

Copy to: The Chief Secretary, Raj Bhawan, Chandigarh, Sector 6, 160019.



भारत सरकार
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Government of India
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D.O. No. CGWA-21/6/2023-CGWA - 123

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Respected [Manohar Ji](#),

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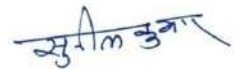
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With regards,

Yours sincerely



(Sunil Kumar)

To
Dr. S. Manohar,
Member Secretary,
Government of Puducherry,
No.15, III Cross (Extn), Mariamman Nagar,
Karamanikuppam,
Puducherry - 605004

Copy to: The Chief Secretary, Main Building, Chief Secretariat, Puducherry – 605001.



भारत सरकार
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Respected [Satija Ji](#),

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With regards,

Yours sincerely


(Sunil Kumar)

To
Shri Amit Satija, IAS
Secretary, Government of Lakshadweep,
1st Floor, Collector's Block,
Secretariat, Kavaratti,
Lakshadweep - 682555

Copy to: The Chief Secretary, District Collector and Development Commissioner, Government of Lakshadweep, Collector's Block, Secretariat, Kavaratti, Lakshadweep – 682555.



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Para 105

“The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986....”

Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

“....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment....”

Para 116

“....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country....”

Para 117

“....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder....”

Para 237

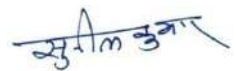
“....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water....”

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Sh. Karan Avtar Singh. IAS,
Government of Punjab,
Punjab Water Regulation and Development Authority (PWRDA),
S.C.O No. 149-152 (3rd Floor), Sector-17-C,
Chandigarh-160017

Copy to: The Chief Secretary, Chief Secretary Office, 6th Floor, Punjab Civil Secretariat -1, Sector 1, Chandigarh.



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected *Mishra Ji*,

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

More recently, Hon'ble National Green Tribunal, New Delhi vide Order dated 25.02.2022 in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) has held that:-

Para 105

“The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986....”

Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

“....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment....”

Para 116

“....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country....”

Para 117

“....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder....”

Para 237

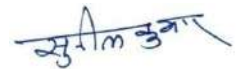
“....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water....”

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Shri Durga Shankar Mishra,
Chief Secretary & Chairman (UPGWD)
Government of Uttar Pradesh.
101, Lok Bhawan, U.P. Civil Secretariat, Vidhan Sabha Marg,
Lucknow - 226001

Copy to: The Chief Secretary, Government of Uttar Pradesh, 101, Lok Bhawan, U.P. Civil Secretariat, Vidhan Sabha Marg, Lucknow – 226001.



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected *Keshni Ji*,

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

More recently, Hon'ble National Green Tribunal, New Delhi vide Order dated 25.02.2022 in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) has held that:-

Para 105

“The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986....”

Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

“....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment....”

Para 117

“....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseverance and sustenance of ground water in the country....”

Para 237

“....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder....”

Para 244

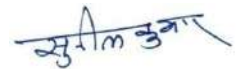
“....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water....”

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Smt. Keshni Anand Arora IAS (Retd.)
Chairperson,
Government of Haryana,
Haryana Water Resources Authority,
Rear Building, 3rd Floor, HSVP, Sector-6, Panchkula,
Haryana-134108

Copy to: The Chief Secretary, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

D.O. No. CGWA-21/6/2023-CGWA - 123

Dated: 24.02.2023

Sub: Adopting/ following Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department in light of Order dated 25.02.2022 passed by Hon'ble National Green Tribunal in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. & Ors.) and Appeal No. 45/2018 (Devidas Khatri vs. Union of India & Ors.) – reg.

Respected [Sahoo Ji](#),

In reference to the subject cited above, your kind attention is invited to the meetings held under the chairmanship of Chairman, CGWA on 27.01.2022 and 27.06.2022 via VC to review the status of regulation and control of ground water abstraction by State/ UT Ground Water Authorities, wherein States/ UTs were requested to intimate in writing the status of adoption of guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these guidelines will be adopted by them and status of development of portal for processing of NOC applications.

The said Guidelines provide that “wherever States/ UTs have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ UTs contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.”

Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that “Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect.”

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Para 107

“.....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve....”

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

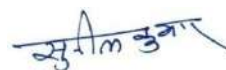
"....CGWA, while giving directions or laying down guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

From the reading of above, it is evident that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020. Ground Water regulatory provisions of State not conforming to MoJS Guidelines may be construed by Hon'ble NGT as non-compliance of the Order of Hon'ble NGT/ Contempt of Court.

In view of the above, it is once again requested that suitable additions/ modifications may be incorporated in the respective Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and the status of adoption of said CGWA Guidelines may be intimated within 2 months.

With regards,

Yours sincerely



(Sunil Kumar)

To
Sh. Ajeet Kumar Sahoo,
Commissioner Secretary (PHE/I&FC)
Civil Secretariat,
Leh-Ladakh 194101

Copy to: The Chief Secretary, The Commissioner Secretary, Jal Shakti Department, Civil Secretariat, Leh Ladakh-194101.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
18/11 जामनगर हाउस, मानसिंह रोड
नई दिल्ली-110011
ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA -385

Dated

09 SEP 2024

To,

The Government of Karnataka. O/o director, Ground Water Directorate
2nd Floor, KSFC Bhawan,
#1/1, Thimmiah Road,
Bengaluru-560052

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that ***"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."***
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made there under...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **Karnataka** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **Karnataka** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.


(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Room No. 320, 3rd floor, vidhanasoudha, Bhagalore-560001.


(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Karnataka

Comparison of GW Regulatory Guidelines of State of **Karnataka** MOJS Guidelines of State of **Karnataka** with MoJS Guidelines.

Prevailing Guidelines of the State **Karnataka** have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	YES
4.	Ground water abstraction / restoration charges	YES
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 2 and 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
18/11 जामनगर हाउस, मानसिंह रोड
नई दिल्ली-110011
ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA-386

Dated 09 SEP 2024

To,

The Commissioner Secretary (PHE/I&FC),
Civil Secretariat,
Leh- Ladakh-194101

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of UTs Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

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Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, UT of **Leh- Ladakh** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the UT of **Leh- Ladakh** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Commissioner Secretary, Jal Shakti Department, Civil Secretariat, Leh Ladakh-194101.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Ladakh

Comparison of GW Regulatory Guidelines of UT of Ladakh MOJS Guidelines of UT of Ladakh with MoJS Guidelines.

Prevailing Guidelines of the UT Ladakh have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	YES
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 2 and 5.

भारत सरकार
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 387

Dated 09 SEP 2024

To,

The Commissioner,
PR & RD & Administrator, APWALTA
D. No. 12-47, PVS Empire, Pathuru Road,
Besides Reliance Digitals, Tadepalli,
Guntur District, Andhra Pradesh

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **Andhra Pradesh** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **Andhra Pradesh** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

✓ **Copy to:** The Chief Secretary, Government of Andhra Pradesh, 1st Block, 1st Floor, Interim Government Complex, A.P secretariat office, velagapudi-522503.


(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Andhra Pradesh

Comparison of GW Regulatory Guidelines of State of Andhra Pradesh MOJS Guidelines of State of Andhra Pradesh with MoJS Guidelines.

Prevailing Guidelines of the State Andhra Pradesh have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 2, 3, and 5.

भारत सरकार
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
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E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA-387

Dated 09 SEP 2024

To,

The Commissioner,
PR & RD & Administrator, APWALTA
D. No. 12-47, PVS Empire, Pathuru Road,
Besides Reliance Digitals, Tadepalli,
Guntur District, Andhra Pradesh

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
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Contd. on page 2

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4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
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6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that ***"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."***
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Contd. on page 3

-3-

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **Andhra Pradesh** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **Andhra Pradesh** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Government of Andhra Pradesh, 1st Block, 1st Floor, Interim Government Complex, A.P secretariat office, velagapudi-522503.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Andhra Pradesh

Comparison of GW Regulatory Guidelines of State of Andhra Pradesh MOJS Guidelines of State of Andhra Pradesh with MoJS Guidelines.

Prevailing Guidelines of the State Andhra Pradesh have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 2, 3, and 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
18/11 जामनगर हाउस, मानसिंह रोड
नई दिल्ली-110011
ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA – 388

Dated

09 SEP 2024

To,

✓ The Commissioner,
Government of Chandigarh
Municipal Cooperation, Sector-17,
Chandigarh

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of UTs Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (Devidaskhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, UT of **Chandigarh** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the UT of **Chandigarh** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Raj Bhawan, Chandigarh, Sector 6, 160019.



(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Chandigarh

Comparison of GW Regulatory Guidelines of UT of Chandigarh MOJS Guidelines of UT of Chandigarh with MoJS Guidelines.

Prevailing Guidelines of the UT Chandigarh have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 2, 3, and 5.

भारत सरकार
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ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 389

Dated 09 SEP 2024

To,

The Special Secretary (Env & Forest),
Government of Delhi,
Environment Department, 6th Level, C-Wing,
IP EState, Delhi Secretariat,
Delhi-110002

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provislons of CGWA Guidelines will prevail. However, In case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of UTs Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

-3-

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, **NCT of Delhi** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the **NCT of Delhi** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Government of Delhi, 3rd Delhi Secretariat, IP EState, New Delhi, Delhi-110002.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - NCT of Delhi

Comparison of GW Regulatory Guidelines of NCT of Delhi MOJS Guidelines of NCT of Delhi with MoJS Guidelines.

Prevailing Guidelines of the UT NCT of Delhi have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 2, 3 and 5.

भारत सरकार
जल शक्ति मंत्रालय
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA ~390

Dated 09 SEP 2024

To,

The Water Resource Department,
Sichai Bhawan,
Near Police Station,
Porvorim, Goa-403501,

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that "wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that ***"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."***
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of Goa is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of Goa that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.


(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Government of Goa Secretariat, Porvorim, Bardez- 403521.


(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Goa

Comparison of GW Regulatory Guidelines of State of Goa MOJS Guidelines of State of Goa with MoJS Guidelines.

Prevailing Guidelines of the State Goa have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	YES
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No.1, 2 and 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
18/11 जामनगर हाउस, मानसिंह रोड
नई दिल्ली-110011
ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 391

Dated 09 SEP 2024

To,

The Chairperson,
Government of Haryana,
Haryana Water Resources Authority,
Rear Building, 3rd Floor, HSVP, Sector-6, Panchkula,
Haryana-134108

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

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4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

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Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of Haryana is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of Haryana that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.


(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh.


(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Haryana

Comparison of GW Regulatory Guidelines of State of Haryana MOJS Guidelines of State of Haryana with MoJS Guidelines.

Prevailing Guidelines of the State Haryana have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	YES
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	YES
4.	Ground water abstraction / restoration charges	YES
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
18/11 जामनगर हाउस, मानसिंह रोड
नई दिल्ली-110011
ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 392

Dated 09 SEP 2024

To,

The Engineer-in-Chief, Jal Shakti Vibhag,
Government of Himachal Pradesh,
Jal Shakti Bhawan
Shimla-171005

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made there under...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **Himachal Pradesh** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **Himachal Pradesh** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Government of Himachal Pradesh, Department of Personnel, H.P. Secretariat, Shimla-171002.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Himachal Pradesh

Comparison of GW Regulatory Guidelines of State of Himachal Pradesh MOJS Guidelines of State of Himachal Pradesh with MoJS Guidelines.

Prevailing Guidelines of the State Himachal Pradesh have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	YES
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	YES
4.	Ground water abstraction / restoration charges	YES
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 393

Dated 09 SEP 2024

To,

The Chairperson, Jammu & Kashmir Water Resources Regulatory Authority,
Government of Jammu & Kashmir,
Ashok Nagar, Satwari,
Jammu-180004

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of UT Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

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Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, UT of **Jammu & Kashmir** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the UT of **Jammu & Kashmir** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, R. No. 2/7, 2nd, Floor Main Building, Civil Secretariat, Jammu-180001.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Jammu and Kashmir

Comparison of GW Regulatory Guidelines of UT of Jammu and Kashmir MOJS Guidelines of UT of Jammu and Kashmir with MoJS Guidelines.

Prevailing Guidelines of the UT Jammu and Kashmir have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 2, 3 and 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA-394

Dated 09 SEP 2024

To,

The Secretary, Water Resource Department,
Government of Kerala,
Room No. 393, 1st Floor, Main Block, Secretariat,
Thiruvanthapuram-695001

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that "wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."

Contd. on page 2

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4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"...Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"...Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"...CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"...CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of Kerala is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of Kerala that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Government Secretariat, Government of Kerala,
Thiruvananthapuram, Kerala, Pin-695001.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Kerala

Comparison of GW Regulatory Guidelines of State of Kerala MOJS Guidelines of State of Kerala with MoJS Guidelines.

Prevailing Guidelines of the State Kerala have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist In State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	YES
4.	Ground water abstraction / restoration charges	YES
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 2 and 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
18/11 जामनगर हाउस, मानसिंह रोड
नई दिल्ली-110011
ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 395

Dated 09 SEP 2024

To,

The Member Secretary,
Government of Puducherry,
No.15, III Cross (Extn), mariamman Nagar,
Karamanikuppam,
Puducherry-605004

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of UTs Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

-3-

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, UT of **Puducherry** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the UT of **Puducherry** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to the Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Main Building, Chief Secretariat, Puducherry-605001.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Puducherry

Comparison of GW Regulatory Guidelines of UT of Puducherry MOJS Guidelines of State of Puducherry with MoJS Guidelines.

Prevailing Guidelines of the UT Puducherry have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No2, 3 and 5.

भारत सरकार
जल शक्ति मंत्रालय
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ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA-396

Dated 09 SEP 2024

To,

The Government of Punjab
Punjab Water Regulation and Development Authority (PWRDA),
S.C. O No. 149-152)3rd Floor), Sector-17-C,
Chandigarh-160017

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that "wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of Punjab is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of Punjab that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement of MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.


(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Chief Secretary Office, 6th Floor, Punjab Civil Secretariat-1, Sector-1, Chandigarh.


(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Punjab

Comparison of GW Regulatory Guidelines of State of Punjab MOJS Guidelines of State of Punjab with MoJS Guidelines.

Prevailing Guidelines of the State Punjab have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	YES
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	YES
4.	Ground water abstraction / restoration charges	YES
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA-397

Dated 09 SEP 2024

To,

The Chief Engineer,
Government of Tamil Nadu,
Public Works Department, Water Resources Department,
State Ground Water & Surface
Water Resources Data Center, Taramani,
Chennai-600113

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above, your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

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3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
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7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

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"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

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".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

-3-

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **Tamil Nadu** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **Tamil Nadu** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.


(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Shankar Rd, Fort St George, Tamil Nadu-600009.


(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Tamil Nadu

Comparison of GW Regulatory Guidelines of State of Tamil Nadu MOJS Guidelines of State of Tamil Nadu with MoJS Guidelines.

Prevailing Guidelines of the State Tamil Nadu have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	YES
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	NO

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 3, 5 and 6.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
18/11 जामनगर हाउस, मानसिंह रोड
नई दिल्ली-110011
ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 398

Dated 09 SEP 2024

To,

The Commissioner, Government of Telangana
PR & RD & Administrator, TSWALTA,
Panchayath Raj Building, Urdu Hall Lane, Himayath Nagar,
Hyderabad-500029

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above, your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that "wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (**MoJS**) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **Telangana** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **Telangana** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three** months i.e. by 09.12.2024.



(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, 5th Floor, Burgula Rama Krishna Rao Bhavan, NH 44, Hill Fort, Adarsh Nagar, Hyderabad, Telangana 5000063.



(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Telangana State

Comparison of GW Regulatory Guidelines of State of Telangana State MOJS Guidelines of State of Telangana State with MoJS Guidelines.

Prevailing Guidelines of the State Telangana State have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 2, 3 and 5.

भारत सरकार
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA -399

Dated 09 SEP 2024

To,

The Chief Secretary & Chairman (UPGWD)
Government of Uttar Pradesh.
101, Lok Bhawan, U.P. Civil Secretariat, Vidhan Sabha Marg,
Lucknow-226001

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above, your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

Contd. on page 2

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

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Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **Uttar Pradesh** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **Uttar Pradesh** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.

(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Government of Uttar Pradesh, 101, Lok Bhawan, U.P. Civil Secretariat, Vidhan Sabha Marg, Lucknow-226001.

(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Uttar Pradesh

Comparison of GW Regulatory Guidelines of State of Uttar Pradesh MOJS Guidelines of State of Uttar Pradesh with MoJS Guidelines.

Prevailing Guidelines of the State Uttar Pradesh have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist In State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	YES
4.	Ground water abstraction / restoration charges	YES
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 2 and 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
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ई-मेल: cgwa@nic.in



Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 401

Dated

09 SEP 2024

To,

Secretary, Government of Lakshadweep,
1st Floor, Collector's Block,
Secretariat, Kavaratti,
Lakshadweep-682555

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above. Your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that *"wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."*

-2-

4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of UTs Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

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"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

Contd. on page 3

Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, UT of **Lakshadweep** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the UT of **Lakshadweep** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

Contd. on page 4

-4-

Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.



(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, District collector and Development Commissioner, Government of Lakshadweep, Collector's Block, Secretariat, Kavaratti, Lakshadweep-682555.



(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - Laksh-dweep

Comparison of GW Regulatory Guidelines of UT of Laksh-dweep MOJS Guidelines of State of Laksh-dweep with MoJS Guidelines.

Prevailing Guidelines of the UT Laksh-dweep have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	NO
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	NO
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 1, 2, 3 and 5.

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग
केंद्रीय भूजल प्राधिकरण
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Government of India
Ministry of Jal Shakti
Department of Water Resources,
RD & GR
Central Ground Water Authority
18/11, Jamnagar House, Mansingh
Road
New NCT of Delhi – 110011
E-mail: cgwa@nic.in

No. CGWA-21/6/2023-CGWA - 400

Dated

09 SEP 2024

To,

The Director, SWID, Government of West Bengal,
Nirman Bhawan, 1st Floor, Salt Lake, Sector-III,
Kolkata-700091

Sub: Adoption of Ministry of Jal Shakti Guidelines for Ground Water regulation by State Ground Water Authority/ Department – reg.

Sir,

This is in reference to the subject cited above, your kind attention is invited to the fact that on the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

2. To have sustainable management of water resources in the country, Govt. of India, Ministry of Jal Shakti notified Guidelines dated 24.09.2020 vide gazette notification S.O. 3289(E) dated 24.09.2020 and subsequent amendment dated 29.03.2023 to these Guideline to regulate groundwater extraction and conserve the scarce groundwater resources in the country.
3. The said Guidelines provide that "wherever States/ UTs have come out with their own groundwater abstraction Guidelines, which are inconsistent with the CGWA Guidelines, the provisions of CGWA Guidelines will prevail. However, in case the Guidelines followed by such States/ UTs contain some more stringent provisions than CGWA Guidelines, such provisions may also be given effect to by the States/ UTs Authorities in addition to those contained in the CGWA Guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance."

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4. Central Ground Water Authority has at various points as well as fora, urged States/UTs to adopt the Guidelines notified by the Ministry of Jal Shakti (MoJS) in their respective States/UTs. The States/ UTs were also requested to intimate in writing the status of adoption of Guidelines notified by Ministry of Jal Shakti (MoJS) and time frame by which these Guidelines will be adopted by them.
5. On comparison on six major provisions with MoJS Guidelines, it has been observed that provisions of State Guidelines are not in consonance with MoJS Guidelines. The comparative analysis is enclosed as **Annexure-A** for ready reference.
6. In the above context, it is informed that the Hon'ble Supreme Court in *MC Mehta vs. UOI*, (1997) 11 SCC 312 vide Order dated 10.12.1996 had held that **"Environment (Protection) Act, 1986 is made by Parliament under Entry 13 List I Schedule 7 read with Article 253 of the Constitution of India and shall have an over-riding effect."**
7. Above is also stressed elaborately in Order dated 25.02.2022 passed by Hon'ble NGT (PB) NCT of Delhi in O.A. No. 69/2020 (Sushil Bhatt vs. Moon Beverages Ltd. &Ors.) and Appeal No. 45/2018 (DevidasKhatrri vs. Union of India &Ors.). Relevant Para(s) of the order are quoted hereunder:

Para 105

"The steps, taken by Central Government or the Authority constituted under Section 3(3) with power to issue directions under Section 5 or to take such measures as are necessary under sub-section 2 of Section 3, are the orders in respect whereof, Section 24 sub-section 1 provides that the same shall prevail over any other enactment having any inconsistent provision. The only exception is with regard to the offences and punishment, subject to the provisions of sub-section 2 of Section 24, which provides, where any Act or omission constitutes any offence punishable under EP Act 1986 and also under any other Act, then the offender found guilty of such offence, shall be liable to be punished under the other Act and not EP Act 1986...."

Para 107

".....Hence directions issued under Section 5 or orders issued on the matters referable to Section 3(2), in our opinion, are statutory orders. We have already discussed that EP Act 1986 is referable to Entry 13 List I Schedule VII of the Constitution read with Article 253, having been enacted pursuant to the International Conference and resolutions and to give effect thereto, it shall prevail over Provincial legislation. All Provincial enactments, relating to ground water, therefore, would have to subserve the Guidelines issued by CGWA since these Guidelines are referable to Section 5 read with Section 3(2) of EP Act, 1986. These Guidelines are not mere executive orders but statutory orders and, in any case, having been issued in exercise of powers under EP Act, 1986, as Stated above, shall prevail over Provincial enactments/legislations. To the extent, subject is covered by EP Act 1986 and the orders issued by CGWA, Provincial legislature would lack power to make law, and if made, shall sub serve...."

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Para 116

"....Therefore, it is now established that irrespective of the legislative list contained in Schedule 7, whenever matter relates to environment is to be seen, if governed by the laws enacted on environment by Parliament, referable to entry 13 List 1 of 7th Schedule, the same shall prevail. In other words, when a subject is covered by a legislation referable to list 1 of Seventh Schedule of the Constitution, to the extent matter is covered by such Central legislation, Provincial legislature would cease to have any legislative competence to that extent, irrespective of entry in list 2. Provincial legislature can make law only on the aspects not covered by Parliamentary enactment...."

Para 117

"....Thus, we are clearly of the view that on the subject of regulation of ground water, provisions of EP Act 1986, the orders issued by Central Government under Section 3(3), and by CGWA under section 5 and/or section 3(2) of EP Act 1986 shall hold field and on this subject Provincial legislation cannot be brought in to impede, obstruct or deny or deprive CGWA, in its function for protection, perseveration and sustenance of ground water in the country...."

Para 237

"....CGWA is a Statutory Authority and has statutory powers to issue directions or take such measures as are necessary for protecting environment. These directions are referable to EP Act 1986, enacted vide Entry 13 List 1 of Constitution and therefore even Provincial legislations would have no competence to touch on this subject. Undoubtedly water is in List II Entry 17 but to the extent, the subject of ground water is part of pollution and governed by EP Act, 1986, for the reasons already discussed above, Provincial legislature would lack competence and it cannot make laws in respect of subject of water, covered by EP Act 1986 or orders, directions, rules, etc. made thereunder...."

Para 244

"....CGWA, while giving directions or laying down Guidelines, had to take into consideration, and is under an obligation, to appreciate the mandate of Supreme Court and cannot abrogate or surrender to Provincial legislations on the ground that in some State there are Provincial legislations with regard to ground water and, therefore, Authorities under those enactments will deal with the issues relating to ground water...."

8. It is evident from the above, that the provisions of ground water regulation and management implemented by State Ground Water Authorities has to be in consonance with MoJS Guidelines notified on 24.09.2020 and amendment dated 29.03.2023. However, State of **West Bengal** is at liberty to incorporate more stringent provisions in the Guidelines as per the hydrogeological condition of the State.

Now therefore exercising the power vested under Section 5 of the Environment (Protection) Act, 1986, this Authority hereby directs the State of **West Bengal** that suitable additions/ modifications may be incorporated in the Provincial Act/Rules in line with CGWA Guidelines dated 24.09.2020 and subsequent amendment to these Guidelines dated 29.03.2023.

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Further, detailed comparative Statement between MoJS Guidelines and prevailing State Act/Rule/Guidelines may be provided to this Authority in attached format **within one month** and final compliance status of adoption of MoJS Guidelines may be communicated to this Authority **within three months** i.e. by 09.12.2024.



(Dr. Sunil Kumar Ambast)
Chairman

Copy to: The Chief Secretary, Nabanna (13th Floor), 325, Sarat Chatterjee Road, Shibpur, Howrah-711102.



(Dr. Sunil Kumar Ambast)
Chairman

State-wise comparison with MoJS Guidelines - West Bengal

Comparison of GW Regulatory Guidelines of State of West Bengal MOJS Guidelines of State of West Bengal with MoJS Guidelines.

Prevailing Guidelines of the State West Bengal have been compared with MOJS Guidelines in respect of the following five major provisions in MOJS Guidelines.

S. No.	Provision related to	Provision exist in State Guidelines (Y/N)
1.	Online Processing of Application	YES
2.	Category exempted from seeking NOC: Section 1 of CGWA Guidelines	YES
3.	Documents to be submitted with application: Impact Assessment, water Audit , Hydro-geological Reports , NAW Certificate and Compliance conditions to be submitted with application for obtaining NOC	NO
4.	Ground water abstraction / restoration charges	Data not available
5.	EC - Section 15 of CGWA Guidelines	NO
6.	Penalty provision -Section 16 of CGWA Guidelines	YES

It may be seen that the State Guidelines do not conform to MOJS Guidelines in respect of S. No. 3 and 5.