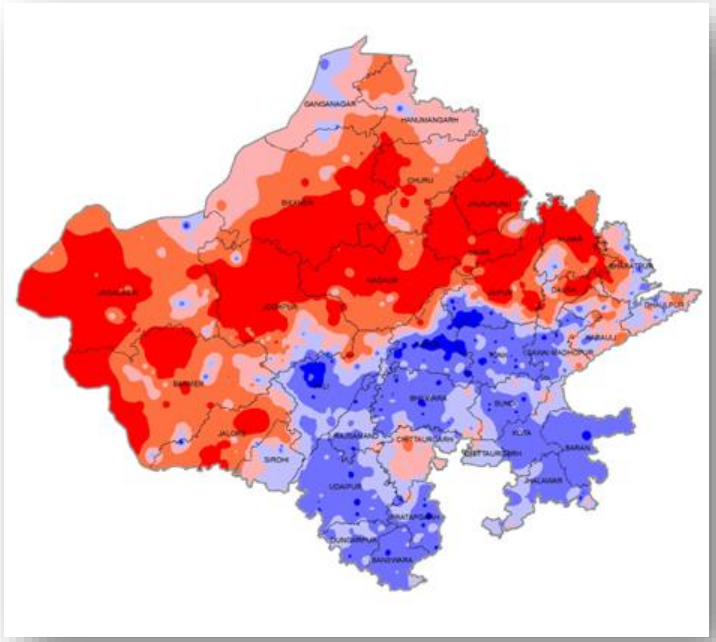


GROUND WATER LEVEL BULLETIN

AUGUST 2025

RAJASTHAN

ABSTRACT

Ground water level Scenario during August 2025 highlighting the findings, status of ground water level and its seasonal, annual and decadal comparison.

CGWB,WESTERN REGION, JAIPUR

1.0 INTRODUCTION

Groundwater bulletin is prepared 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 26351 observation wells called **National Hydrograph Network Stations (NHNS)**, as on 30.03.2025, located all over the country is being monitored.

2.0 STUDY AREA

The State of Rajasthan comprising of 33 districts has a geographical area of 3,42,239 square kilometers (sq km) and is the largest State in the country. Administrative division map of Rajasthan is shown in Figure-1. It is situated between north latitudes 23°03’ and 30°12’ and east longitudes 69°30’ and 78°17’. The ground water monitoring is being carried out through a network of observation wells- the National Hydrograph Network Stations (NHS).

Physiographically the state is divided into four major units, i.e., Aravalli hill ranges, Eastern plains, Western Sandy Plain and Sand Dunes & Vindhyan Scarpland and Deccan Lava Plateau.The Aravalli Hill Ranges from the main water divide in Rajasthan.

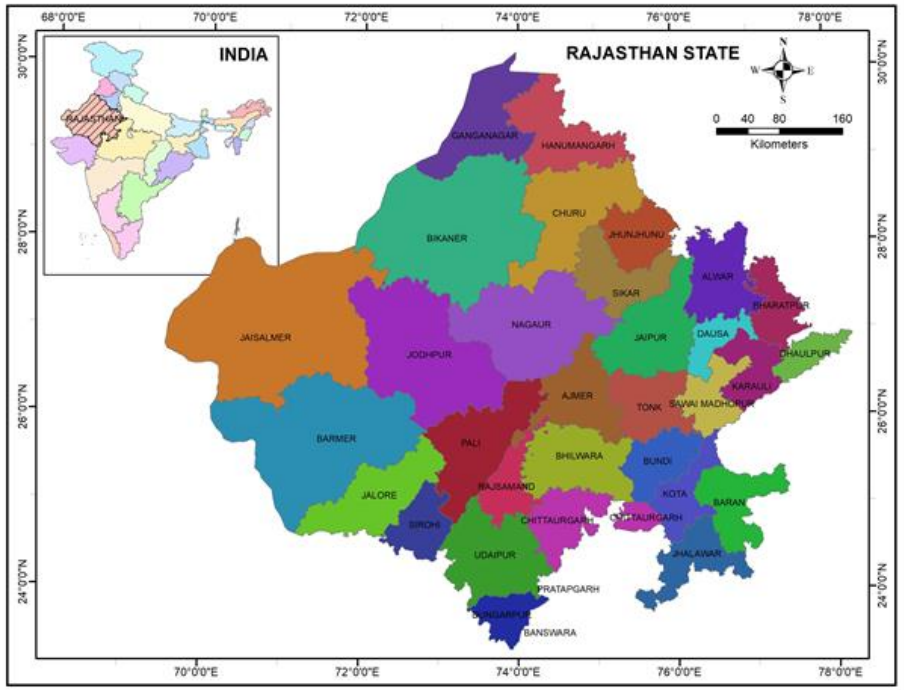


Figure-1: Map showing administrative divisions of Rajasthan

Luni is the only river west of Aravallis. In the remaining area of western Rajasthan comprising about 60% of the geographical area of the state, the drainage is internal, and the streams are lost in the desert sands after flowing for a short distance from the point of origin. In the east of Aravalli ranges, the main rivers are Chambal, Banganga, Banas, Sahibi, Kantli, Banas and Mahi.Diverse rock types ranging from the oldest Archaean Metamorphics to Sub-Recent to Recent alluvium and wind-blown sand are exposed in Rajasthan. However, in a major portion of the area, particularly in Western Rajasthan, the older rocks lie concealed below a cover of alluvium and blown sand and underlain by hard rock (nearly 40%) consisting of the Archaeans

crystalline (Bhilwara Super Group), Proterozoic rocks comprising Aravalli and Delhi Super Groups, Erinpura Granite, Malani volcanics and plutonic suite of rocks and their equivalents, Marwars, Vindhyans and Deccan Traps. The soft rocks include the alluvium and the blown sand, which occupy the major portion in the remaining part of the State.

3.0 GROUND WATER LEVEL MONITORING

The National Hydrograph Network Stations set-up is a system of spatially distributed observation points at which periodic monitoring of ground water and regime behavior viz. recording of water levels and temperature and collection of ground water samples for water (chemical) quality analysis are done. The main objectives of monitoring of water levels and water quality are to observe the rise and fall of ground water levels and to study changes in quality of water in space and time consequent to changes in the inputs and outputs. Database on ground water levels and quality created through this effort forms an important tool in the evaluation of optimum development and decision making on the various aspects of water resources management. Presently 1459 NHS comprises of 638 dug well and 821 piezometers in the state are being monitored.

The district-wise breakup of the water level monitoring stations is given in Table-1.

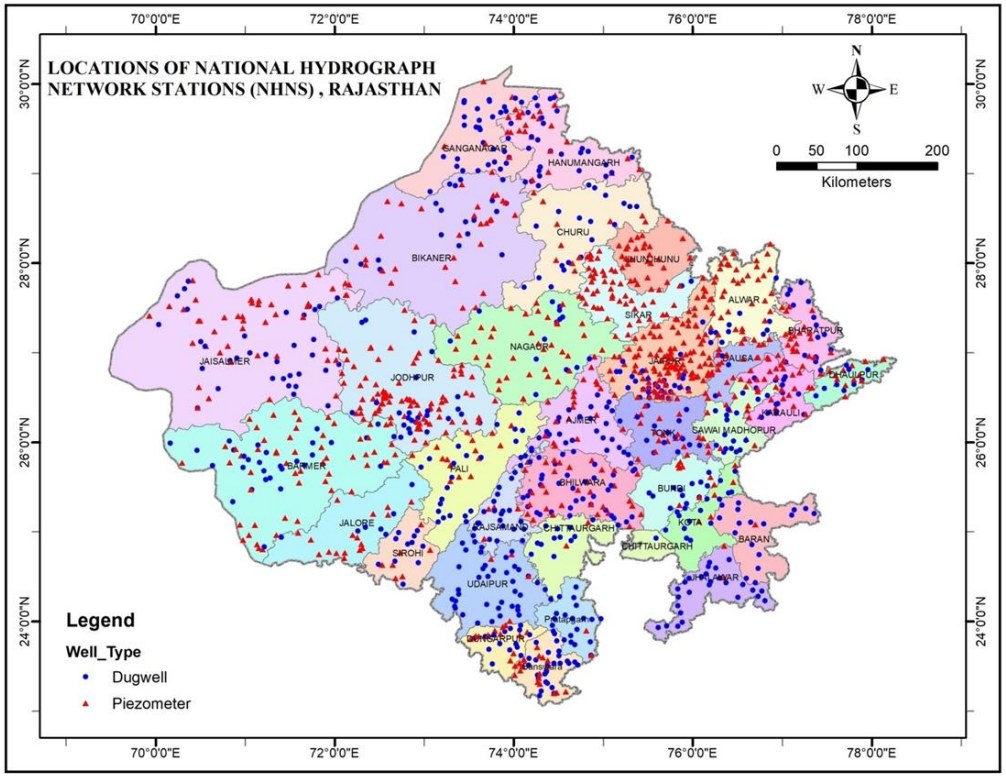


Figure- 2: Map showing locations of monitoring wells (NHNS) in Rajasthan State

Sl. No.	District	Geographical area (sq km)	Total Number of NHS			Number of NHS monitored		
			Dug well	Piezometer	Total	Dug well	Piezometer	Total
1	Ajmer	8481	27	19	46	23	12	35
2	Alwar	8380	10	39	49	8	30	38
3	Banswara	4536	28	19	47	25	15	40
4	Baran	6955	17	1	18	13	0	13
5	Barmer	28387	31	55	86	26	38	64
6	Bharatpur	5100	15	20	35	14	18	32
7	Bhilwara	10455	36	32	68	33	25	58
8	Bikaner	27244	19	35	54	16	31	47
9	Bundi	5550	12	9	21	9	7	16
10	Chittaurgarh	7880	16	2	18	12	1	13
11	Churu	16830	19	11	30	15	11	26
12	Dausa	3470	5	27	32	5	23	28
13	Dhaulpur	3000	9	12	21	9	11	20
14	Dungarpur	3770	16	13	29	14	12	26
15	Ganganagar	10978	31	6	37	30	5	35
16	Hanumangarh	9656	29	24	53	23	21	44
17	Jaipur	11066	30	121	151	27	87	114
18	Jaisalmer	38401	35	48	83	30	44	74
19	Jalore	10640	7	17	24	4	15	19
20	Jhalawar	6219	27	2	29	27	0	27
21	Jhunjhunu	5928	0	30	30	0	24	24
22	Jodhpur	22850	25	97	122	22	67	89
23	Karauli	5016	14	26	40	14	22	36
24	Kota	5481	16	5	21	14	3	17
25	Nagaur	17718	13	38	51	11	32	43
26	Pali	12387	22	13	35	18	13	31
27	Pratapgarh	4360	19	2	21	16	1	17
28	Rajsamand	4768	26	4	30	18	4	22
29	Sawai Madhopur	5043	17	11	28	16	8	24
30	Sikar	7732	2	50	52	2	43	45
31	Sirohi	5136	11	7	18	9	4	13
32	Tonk	7194	16	22	38	13	15	28
33	Udaipur	11761	38	4	42	34	3	37
	Total	342,239	638	822	1459	550	645	1195

Table-1: District-wise distribution of water level monitoring stations

4.0 RAIN FALL

Rajasthan receives much lower rainfall compared to the other parts of the country. Out of the total rainfall, a sizable portion is in the beginning of the rainy season which is mainly used for building the soil moisture and is also lost to evaporation because of the arid conditions. The amount infiltrating through the soil mass to contribute to ground water storage is of the order of 5% to 7% in areas underlain by hard rocks and 10% to 15% in alluvial areas.

The normal annual rainfall of Rajasthan is 435.7 mm. However, during the period from 2015-24, highest average annual rainfall of the State occurred in the year 2019 and 2024 and lowest in the year 2017. The average annual rainfall (2024) is 33.8% more than the normal annual rainfall. The annual rainfall of the State during SW monsoon 678.4 mm +56% excess rainfall than its LPA.

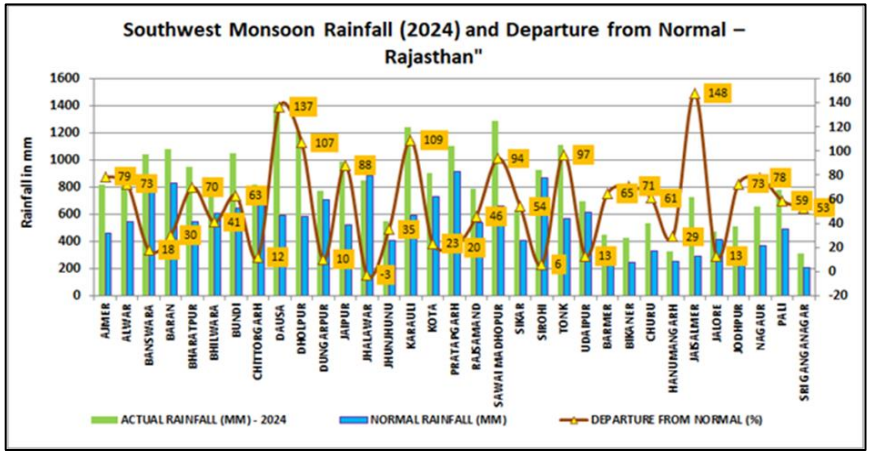


Figure-3: District wise Average annual rainfall and departure from normal rainfall

5.0 GROUND WATER LEVEL SCENARIO -MONSOON **(August 2025)**

5.1.1 Depth To Water Level (August 2025)-Unconfined Aquifer

A total of 1195 monitoring stations were analyzed across Rajasthan during August 2025.Depth to water level varies from 0.01 mbgl (Mandawar,Jhalawar district) to 148.8 mbgl (Dayakor, Jodhpur district).

Water level more than 40 mbgl was monitored at 21% stations and spread from north west to western, central , south western and north eastern parts of the State mostly covering Jodhpur, Jaipur , Sikar, Nagaur, Jhunjunu, Jalore, Alwar, Churu, Bikaner, Dausa, Jaisalmer districts. Depth to water level between 20 to 40 mbgl was recorded in 16.9 % monitoring stations, stretching from north eastern , central northern to western part of the State, covering mainly in districts such as Jaisalmer, Barmer, Jaipur, Hanumangarh, Bikaner, Alwar, Jodhpur, Dausa, Nagaur, Churu , Bharatpur and Sikar. Depth to water level between 10 & 20 mbgl was recorded in 13.81% stations falling mostly in Hanumangarh , Jodhpur, Jaisalmer, Barmer, Bikaner, Ganganagar, Jaipur, Alwar, Karauli districts. Depth to water level ranging from 5 to 10 mbgl was recorded at 11.13% stations in scattered mainly in districts such as Ganganagar, Jaisalmer, Bhilwara, Jodhpur, Dungarpur, Jaipur, Bharatpur, Bikaner, Karauli, Sirohi and Barmer .Shallow water levels ranging between 2 & 5 mbgl was observed at 13.89 % stations spread over south, south east part of State falling in Bhilwara, Jaipur, Udaipur, Pali, Rajsamand, Banswara, Karauli, Tonk, Dungarpur and Bharatpur districts .Shallow water level i.e. less than 2 mbgl have been observed at 23.26% stations and falling mainly in Banswara, Jaipur, Udaipur,Ajmer, Bhilwara, Tonk,Jhalawar, Sawai Madhopur, Pali, Pratapgarh, Bundi, Bara, Kota, Dungarpur and Rajsamand districts.

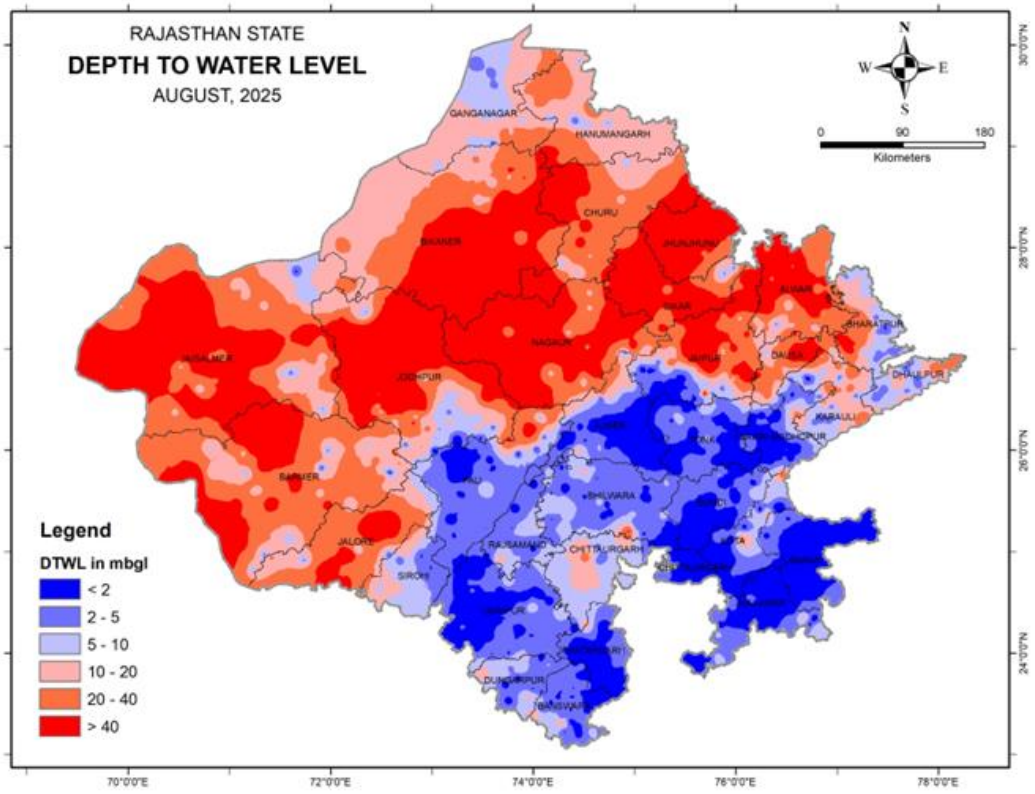
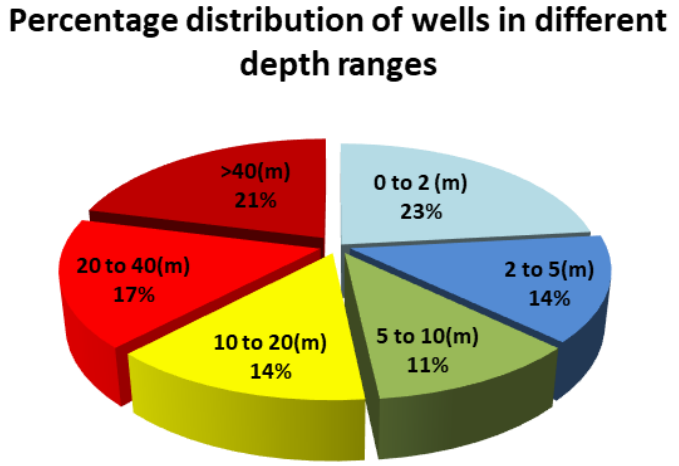


Fig4: Depth to Water level map of August 2025



5.1.2 Seasonal Fluctuation in Water Level in Unconfined Aquifer

Seasonal Fluctuation in Water Level in Unconfined Aquifer - (November 2024 - August 2025)

Total number of wells analyzed are 1008. A perusal of map (Fig-5) of water level fluctuation from November 2024 to August 2025 reveals that 65.5% stations shown rise, 34% decline in water level and 0.5% stations shows no change in water level.

Rise in Water Levels:

Area of rise in water level is significantly visible in Sothern and Eastern part of Rajasthan and in western Rajasthan districts such as Barmer, Pali, Nagaur, Jaisalmer, Bikaner, Churu and Sirohi shows mainly rise in water level. Minimum rise is recorded at 0.01 m at Kapasan1, Chittaurgarh district & maximum rise was recorded 37.68 m in Batawa Matha ,Jodhpur district. Rise in water level < 2m in 39% stations mostly in southern and eastern part of Rajasthan. Water level rise between 2 & 4m was shown by 13.2% stations and more than 4m has been recorded at 13.3% stations scattered mostly in districts falling in western and south eastern part of Rajasthan State.

Decline in Water Levels:

About 34% stations shows decline in water levels and mostly scattered in north-western , central and south western part of the state. Minimum decline was recorded at Karsai, Karauli district (0.01m)& maximum decline was recorded 30.12 m at Lordiya, Jodhpur district. Decline in water level <2m was recorded in 25.3% stations. Decline in water level between 2 & 4m as recorded at 3.8% stations. Water level decline >4m was exhibited by 5% stations mostly falling in central and north western part of the State.

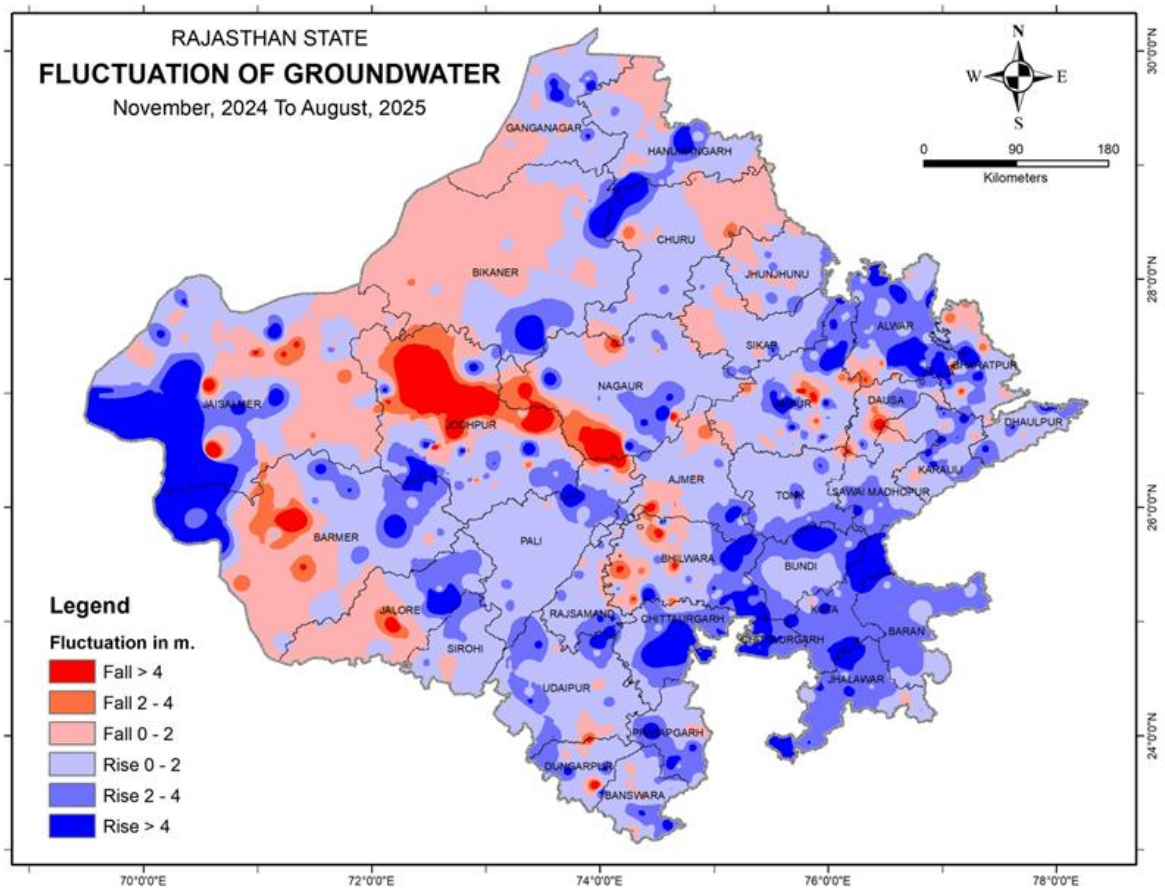


Fig5: Water level Fluctuation map November 2024 to August 2025

Seasonal Fluctuation in Water Level in Unconfined Aquifer - (January 2025 - August 2025)

Total number of wells analysed are 1047. A perusal of map (Fig-6) of water level fluctuation from January 2024 to August 2025 reveals that 74.2% stations shown rise, 25.6% decline in water level and 0.2 % of wells shows no change in water level.

Rise in Water Levels:

Area of rise in water level is significantly visible in Sothern and Eastern part of Rajasthan and in western Rajasthan districts such as Barmer, Pali, Nagaur, Jaisalmer, Bikaner, Churu and Sirohi shows mainly rise in water level. Minimum rise is recorded at 0.01 m at Kalwad, Jaipur district & maximum rise was recorded 39.65 m in Bastwa Mata ,Jodhpur district. Rise in water level < 2m in 39.9% stations mostly in southern and eastern part of Rajasthan. Water level rise between 2 & 4m was shown by 16.6 % stations and more than 4m has been recorded at 17.1% stations scattered mostly in districts falling in south central and south eastern part of Rajasthan State.

Decline in Water Levels:

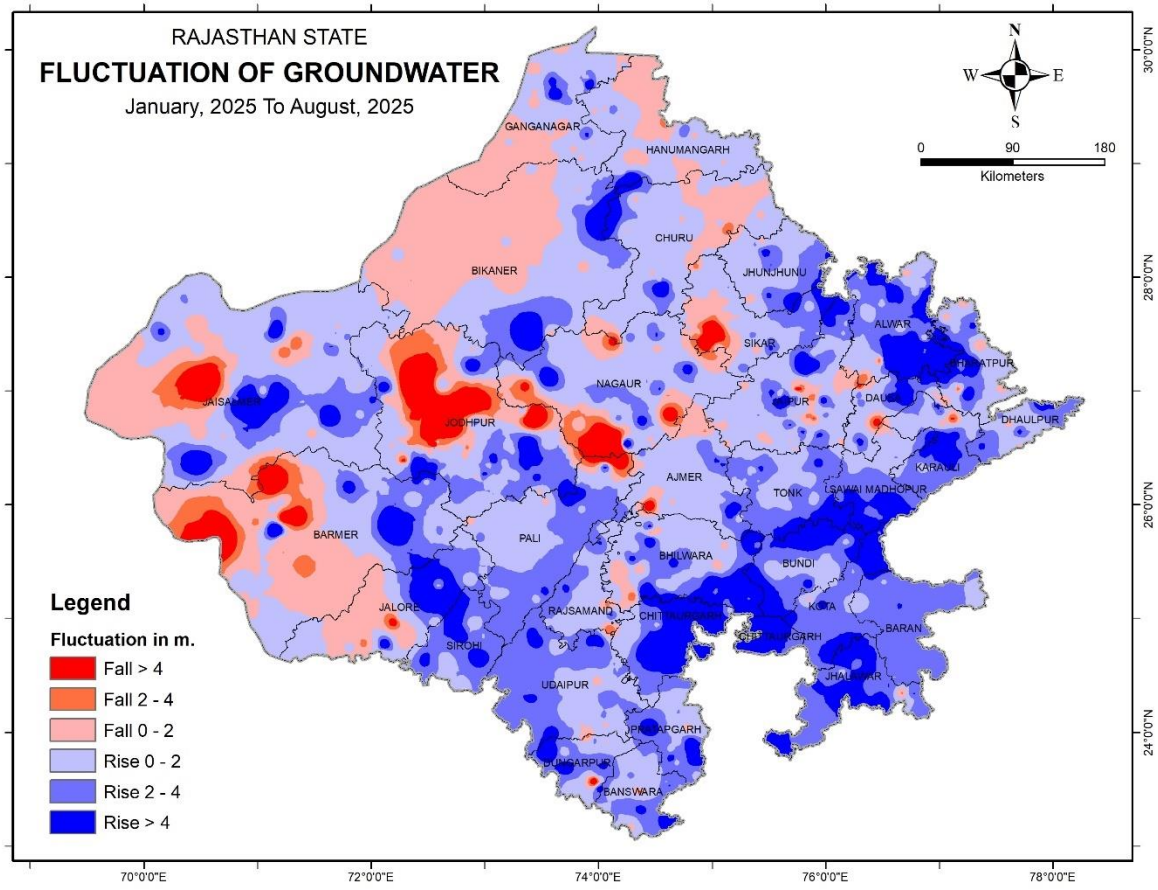


Fig6: Water level Fluctuation map January 2025 to August 2025

About 19.3% stations shows decline in water levels and mostly scattered in north-western , central and south western part of the state. Minimum decline was recorded 0.01m at Tatarsar,Ganganagar district,Ghana, Sikar district and Rawastar, Barmer district & maximum decline was recorded 42.40 m at Bhawal Pz, Nagaur district. Decline in water level <2m was recorded in 19.3% stations. Decline in water level between 2 & 4m as recorded at 2.7% stations. Water level decline >4m was exhibited by 3.6% stations mostly falling in central and north western part of the State

.

Seasonal Fluctuation in Water Level in Unconfined Aquifer (May 2025 – August 2025)

Total number of wells analysed are 1102. A perusal of map (Fig-7) of water level fluctuation from May 2025 to August 2025 reveals that 85.2% stations shown rise, 14.8 % decline stations shows in water level.

Rise in Water Levels:

Area of rise in water levels are visible in all districts mainly in districts falling in eastern, southern and central part of the state. Minimum rise in water level is recorded 0.01 m at Bhagsar station at Hanumangarh district & maximum rise was recorded 37.44 m in Alam ka Gaon, Jaisalmer district. Rise in water level < 2m in 33.9% stations mostly in western part of Rajasthan.Water level rise between 2 & 4m was shown by 22.5% stations more than 4m has been recorded at 28.8% stations mainly falling in southern , central and eastern parts of the State.

Decline in Water Levels:

About 14.8 % stations scattered in districts such as Jodhpur, Bikaner, Jaisalmer, Barmer,Nagaur, Churu and few stations of Jhunjunu district. Minimum decline is recorded at Santara, Barmer and Bhavanipura at Jaisalmer district . Maximum decline was recorded at 33.48 m in Lordiya , Jodhpur district Decline in water level <2m was recorded in 11.1% stations and falling overall the State. Decline in water level between 2 & 4m as recorded at 1.7 % stations and water level decline >4m was recorded in 2% stations falling in western, central parts of the State .

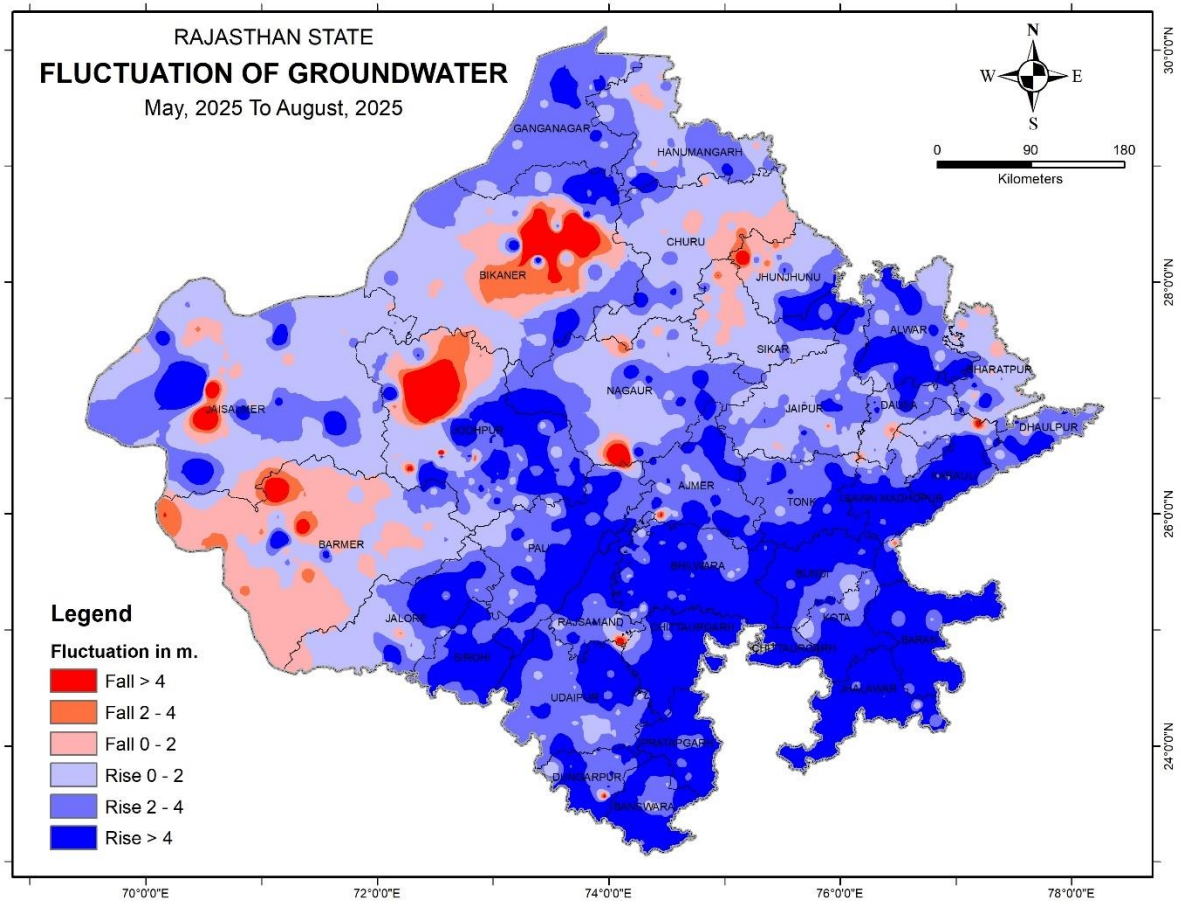


Fig7: Water level Fluctuation map May 2025 to August 2025

.

.

5.1.3 Annual Fluctuation in Water Levels in Unconfined Aquifer

Annual Fluctuation in Water Level in Unconfined Aquifer (August 2024 to August 2025)

Total number of wells analyzed are 966. A perusal of map (Fig 9) of annual water level fluctuation from August 2024 to August 2025 reveals that 60.2% stations shown rise, 39.2% decline and 0.6 % stations shows no change.

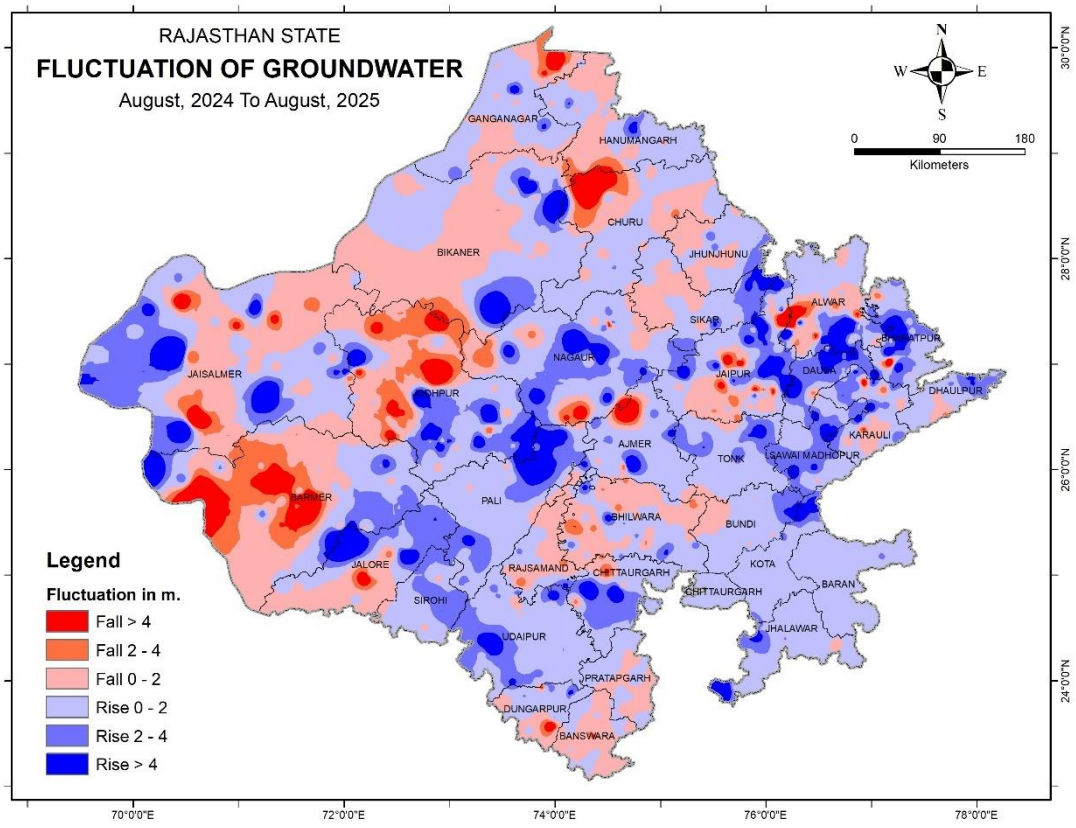


Fig8: Annual Water level Fluctuation map August 2024 – August 2025

Rise in Water Levels:

Area of rise in water spreads from eastern, southern and south and central parts of the State. Minimum rise was recorded 0.01 m Tarla, Barmer district,Silohi,Bhilwara district and Girdharpura ,Kota district and maximum rise was recorded at 32.05 m at Khokagaon , Jalore district. Rise in water level < 2m in 38.6% stations mostly in southern , eastern and central part of Rajasthan. Water level rise between 2 & 4m was shown by 10% stations mainly around western ,central and south eastern part of the State and more than 4m has been recorded at 29 % stations and most of the stations falling in the eastern, central and western most part of the State .

Decline in Water Levels:

About 39.2 % stations shows decline in water level fluctuations and scattered mainly in districts covering western part of the state. Minimum decline was recorded at 0.1 m in Gadra road , Barmer district and maximum decline was recorded at 37.8 m Bhijrasan , Churu district. Decline in water level <2m was recorded in 29% stations mainly falling in north western part of the state and scattered in districts falling in central and southern part of the State . Decline in water level between 2 & 4m as recorded at 4.5 % stations which is falling in the northern and western part of the State. Water level decline >4m was exhibited by 5.8% stations mostly in districts falling in the western northern part of the state .

5.1.3 Annual Fluctuation in Water Level

Annual Fluctuation in Water Level in Unconfined Aquifer (August 2023 to August 2025)

Total number of wells analyzed are 898. A perusal of map (Fig 9) of annual water level fluctuation from August 2023 to August 2025 reveals that 80.8 % stations shown rise in water level and 19.2% stations recorded decline in water levels .

Rise in Water Levels:

Area of rise in seen in all the districts and spreads from eastern, western, southern and central parts of the State. Minimum & maximum rise was recorded 0.04 m in Jaisinghpura, Jhunjhunu district and 38.84 m Khoraladkhani ,Jaipur district. Rise in water level < 2m in 33.0% stations mostly in all the districts of Rajasthan. Water level rise between 2 & 4m was shown by 22.5% stations mainly around central ,southern and eastern part of the State and more than 4m has been recorded at 25.4% stations and most of the stations falling in the eastern, and central part of the State .

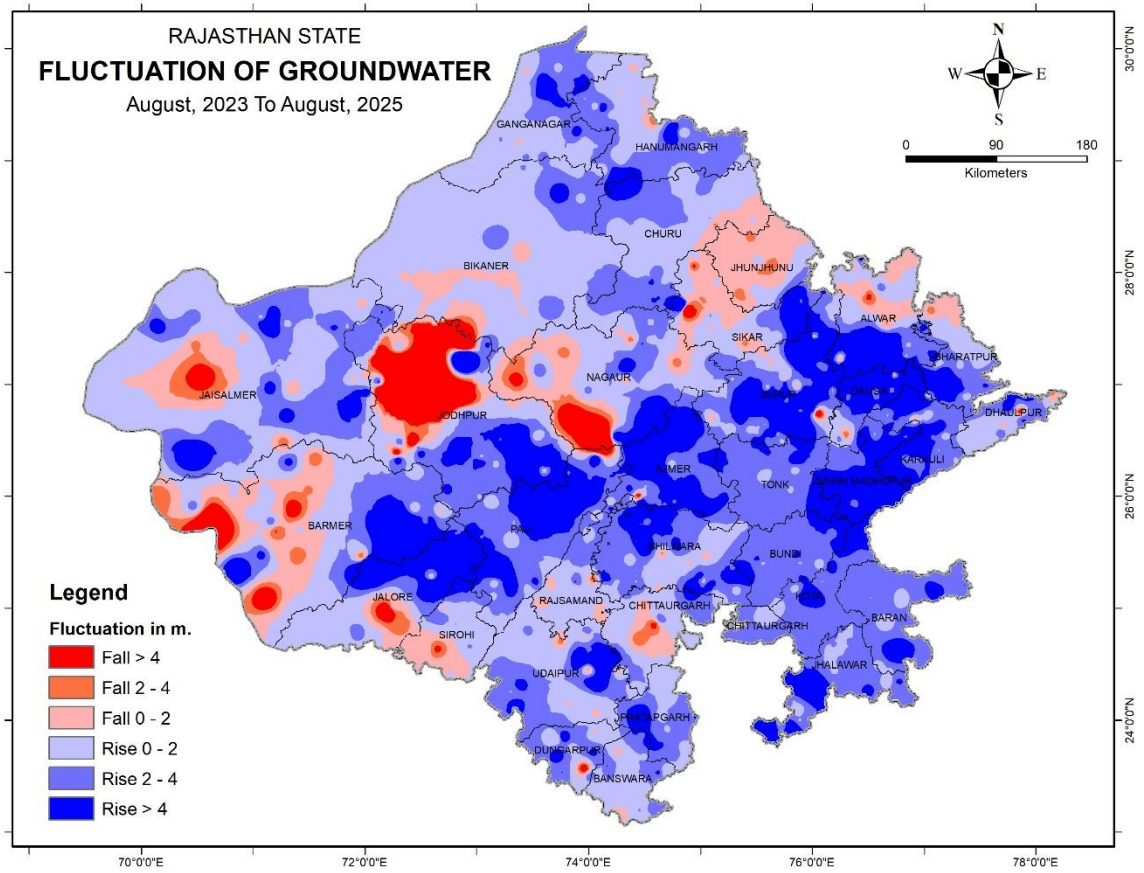


Fig9: Annual Water level Fluctuation map August 2023 – August 2025

Decline in Water Levels:

About 19.2 % stations shows decline in water level fluctuations and scattered mainly in Barmer, Jaisalmer, Jodhpur, Nagaur, Jalore, Sirohi, Jhunjunu and Alwar districts. Minimum & maximum decline was recorded at 0.01 m in Gokalpura, Sikar district and 32.6 m Lordiya , Jodhpur district. Decline in water level <2m was recorded in 12.1 % stations mainly scattered in northern and western part of the state . Decline in water level between 2 & 4m as recorded at 3.9% stations which is falling in the northern western and scattered in north eastern part of the State. Water level decline >4m was exhibited by 3.1% stations mostly falling in Barmer, Jaisalmer, Jodhpur, Nagaur and Jalore districts .

5.1.4 Decadal Fluctuation of Water Level in Unconfined aquifer

Decadal Variation - Decadal average Fluctuation of August (2015-2024) to August 2025

Total number of wells analyzed are 1106 . A perusal of map (Fig 10) of decadal water level fluctuation from August (2015- 2024) to August 2025 reveals that 69.6 % stations shown rise in water levels and 30.4 % stations shows decline in water level

Rise in Water Levels:

Area of rise in water spreads from eastern, western, southern and central parts of the State. Minimum rise was recorded is 0.01 m in Rawastar, Hanumangarh district and maximum rise was recorded 35.04 m at Phulia, Jaisalmer district. Rise in water level < 2m in 31.3% stations mostly found in all districts part of Rajasthan. Water level rise between 2 & 4m was shown by 17.0% stations mainly around central , eastern and western most part of the State and more than 4m has been recorded at 21.3% stations and mostly falling in the central , eastern and western most part of the State

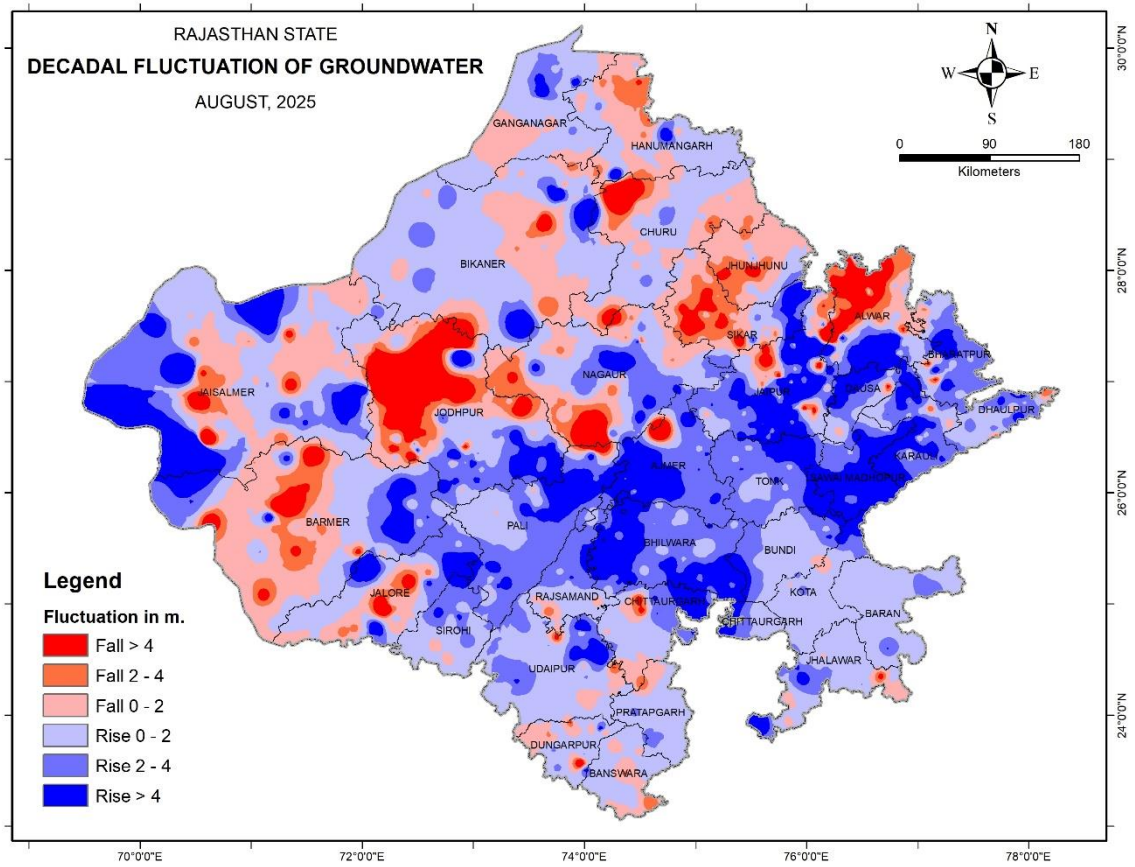


Fig10: Decadal average Fluctuation August 2015-24 to August 2025

Decline in Water Levels:

About 30.4 % stations shows decline in water levels and scattered in districts falling in northern, western and north western and north eastern part of the State . Minimum decline was recorded at 0.01 m in Ronu Badi, Sikar district and maximum decline was recorded at Lordiya , Jodhpur district (29.61 m). Decline in water level <2m was recorded in 15.9% stations mainly falling in northern, western and north western and north eastern part of the state . Decline in water level between 2 & 4m as recorded at 6% stations which is falling in the central, northern, north eastern and western part of the State. Water level decline >4m was exhibited by 8.5% stations mostly falling in the north western , central north eastern part of the State.

6.0 Summary:

The Central Ground Water Board (CGWB), Western Region (WR), Jaipur, conducts quarterly groundwater monitoring under the National Ground Water Monitoring Programme. Monitoring is carried out in January (post-monsoon), May (pre-monsoon), August (post-monsoon), and November. Currently, 1,489 National Hydrograph Stations (NHS)—consisting of 647 dug wells and 842 piezometers—are being monitored across Rajasthan. Presently 1459 NHS comprises of 638 dug well and 821 piezometers in the state are being monitored.

In August 2025, 1195 monitoring stations were analyzed, revealing that the depth to water level varied significantly across the state. The shallowest water level was recorded at 0.01 mbgl (Mandawar,Jhalawar district) while the deepest was 148.8 mbgl (Dayakor, Jodhpur district).Seasonal water level fluctuations were assessed across different periods. From November 2024 to August 2025, analysis of 1008 wells showed that 65.5% of stations experienced a rise in water levels, 34% saw a decline and 0.5% stations shows no change. For the period January 2024 to August 2025, 1047 wells were analyzed, with 74.2% showing a rise, 25.6 % a decline. Similarly, from May2025 to August 2025, 1102 wells were examined, revealing a rise in 85.2% of stations, 14.8 % decline in water levels.

The annual fluctuation from August 2024 to August 2025 reveals that 60.2% stations shown rise in water levels , 39.2% decline in water levels and 0.5 % stations shows no change . And for August 2023 to August 2025 showed slightly different figures, with 80.8 % of stations experiencing a rise in water levels , 19.2% of wells showing a decline in water level .A long-term comparison of August 2025 water levels with the mean of August (2015–2024) was conducted using 1106 wells. The findings revealed that 69.6% of stations showed a rise in water levels, while 30.4% exhibited a decline, indicating a concerning trend of groundwater depletion in western and northern part of the State over the past decade.

7.0 Recommendations:

1. **Enforce strict extraction limits** in high-depletion zones with regulated borewell permits and penalties for overuse.
2. **Boost conservation** Promotion of Water Conservation Practices, such as rainwater harvesting, watershed management, and micro-irrigation techniques
3. **Accelerate aquifer recharge** :Recharge Initiatives like constructing check dams, percolation tanks, and artificial recharge structures in depleted regions to enhance aquifer replenishment.
4. **Educate communities** :Public Awareness Campaigns to educate farmers and industries on efficient water use and the adoption of drought-resistant crops.
5. **Implement smart monitoring** :Monitoring & Data-Driven Policies through real-time groundwater tracking and periodic reassessment of extraction limits based on aquifer health.