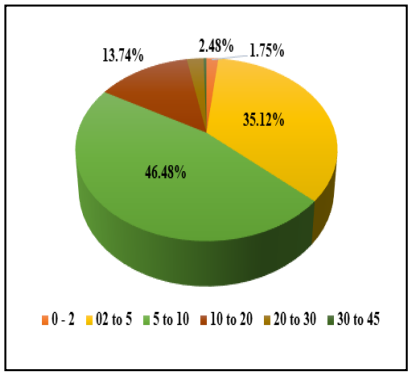

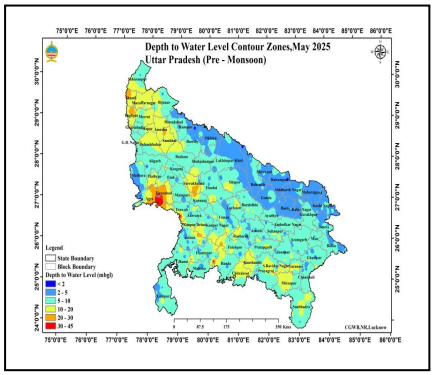

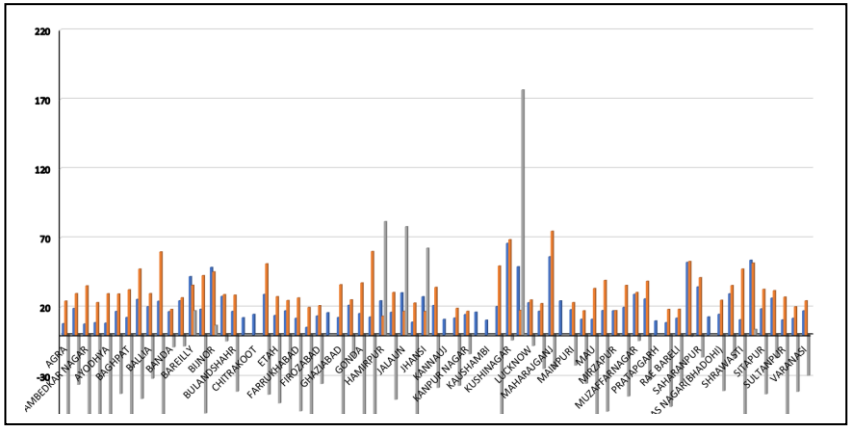

GROUND WATER LEVEL BULLETIN
UTTAR PRADESH
MAY 2025

ABSTRACT

Ground water level Scenario during Pre-monsoon – 2025 highlighting the finding, status of ground water level in unconfined aquifer and its annual and decadal comparison.

CGWB, NORTHERN REGION LUCKNOW

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 in volve climatic parameters like rainfall, vapor transpiration etc. whereas anthropogenic in fluences 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 1535 observation wells called National Hydrograph Network Stations (NHNS), as on 31.05.2025, located all over the State is being monitored.

2.0. STUDYAREA

The State of Uttar Pradesh forms a part of vast Gangetic Alluvial Plain covering an area of 2,40,928 Sq. Km. and lies between North latitude $23^0$52'12" & $30^0$24'30" and East longitude $77^0$05'38" & $84^0$38'30". It is bounded by Uttarakhand on the NW, Nepal on the NE, Bihar on the East, Madhya Pradesh in the South, and Haryana, Delhi & Rajasthan in the West as shown in figure 1.

Figure-1: Map showing major aquifers and administrative divisions of UP

The state is covered with rich fertile soil and underlain by a large thickness of alluvium making it one of the richest grounds water repositories of the world. Ground water is a major source of fresh water on earth. It is the most dependable source of water, comparatively free from the vagaries of

nature, easily accessible, available at the point of use and economical. Hence it is being developed indiscriminately, and the ground water reservoir is stressed. The State being the most populous in the country, with a population density of 829 persons per sq. km and a high rate of population growth (20%), its demand for water is soaring. Also, due to industrialization, urbanization and modern farming practices, its quality is also at stake.

The food production in Uttar Pradesh is commensurate with the self-sufficiency of the country. One of the major contributors to this sufficiency is irrigation. To meet this high irrigational requirement, water resources are increasingly developed. Ground water contributes to about 71 % of the irrigation needs of the State. The indiscriminate development of ground water has resulted in the depletion of groundwater storage and lowering of water level in certain areas. On other side the surface water development is as having shallow water level has resulted in water logging and soil salinization. The geology and structure of the formations existing in an area control by occurrence and movement of ground water. The geomorphic conditions also have a great impact on ground water scenario. The larger part of the State is underlain by fluvial sediments laid down in the foredeep between Plateau region in south and Himalayas in north during the Quaternary period by the Indus-Ganga system of drainage over the Precambrian topography existing during geological past. These deposits owe their origin to riverine activity. The southern part of the State has entirely different geological conditions, being underlain by Precambrian formations under a thin alluvial cover. Broadly, the State can be divided into two hydrogeological units.

1. Unconsolidated zone.
2. Consolidated, hardrock zone.

The hydrogeological conditions of the above two units widely differ and are discussed subsequently in brief.

Unconsolidated Zone:

This unit covers nearly 85% of the State area. The unconsolidated formations comprising the area have been deposited through mighty rivers originating from the great Himalayan Mountains. These sediments are an admixture of pebbles, gravel, sand, silt, clay and kankar. The sediments are generally coarser in the north and gradually become finer southeast ward along downstream of the drainage which is a typical feature of fluvial deposits. This zone consists of mainly two parts, the Terai and the Alluvial Plain. However, the foot hill zone is a very small part of Bhaber belt and lies in the northern parts of Bijnore and Saharanpur districts. The Terai is a narrow-disconnected belt along the northwestern fringe of the State. The Alluvial Plain occupies the area south of Terai and can further be divided into two subunits - Younger Alluvium and Older Alluvium.

The younger alluvium occurs mostly along the present-day flood plain area. The continuous shifting of the drainage network with time caused reworking of their earlier deposits, giving rise to the younger alluvium. The older alluvium occupying comparatively high area covers a major part of the Plain. A typical characteristic of older alluvium is the formation of kankar within itself due to leaching of calcium carbonate under favorable climatic conditions. The kankar occasionally forms pans restricting downward movement of water.

The thickness of alluvial sediments is variable and generally goes up to 500m. below which occur the semi-consolidated Upper Siwalik formations. The Shallower basement occurs in isolated areas which are known as “Basement highs." This unconsolidated zone is porous and permeable with primary intergranular porosity and has good ground water potential. The sub- surface correlation of formations in the state has shown the presence of several aquifers down to a depth of 750 m below the ground. These aquifers mainly encountered in Central Ganga Plain have been grouped on the basis of lithological characters as well as based on interpretation of electrical logs of Boreholes drilled and are as follows:

1. First aquifer 0.0 – 150.00 mbgl
2. Second aquifer 160.00 – 210.00 mbgl
3. Third aquifer 250.00 – 360.00 mbgl
4. Forth deep aquifer 380.00 – 600.00 mbgl

The upper part of the first aquifer down to 50 mbgl is the main source of drinking water through hand pumps and dug wells and is unconfined in nature. The first aquifer as a whole which is under unconfined to semi-confined conditions, it is the most potential aquifer group which is the main source of groundwater in the State extensively exploited through private as well as Government tube wells to meet the drinking water and irrigation needs. The deeper aquifers are confined in nature being exploited to a very limited extent. The yield of the second aquifer is limited while the third aquifer is potential. The shallow and phreatic aquifers are under heavy stress.

Consolidated Zone:

The Bundelkhand Vindhyan plateau region is underlain by a variety of Precambrian formations, mostly granite and granite gneisses, Vindhyan sandstone, limestone & shale, under a thin a alluvial cover or without alluvial cover. As such these formations are hard and compact and devoid of any primary porosity. The ground water in these formations occurs in the secondary porosity of these formations. The secondary porosity has developed due to cracks and fractures which are open at the surface and tighten at depth. The ground water occurs under unconfined or water level conditions in these formations.

The alluvial sediments of moderate depth along the river course sand in

valleys form potential ground water repositories. The weathered mantle over the entire until so forms potential aquifers. These aquifers are monitored mostly through open wells over the area.

3.0. GROUNDWATER LEVEL MONITORING

Central Ground Water Board, Northern Region, is monitoring changes in groundwater regime in Uttar Pradesh State on quarterly basis continuously. This is facilitated by a network of monitoring stations in the State located in diverse hydrogeological and geomorphic units. The number of operational wells till May 2025 was 1535 which include 1082 dug wells and 453 piezometers shown in **figure 2**. The district-wise breakup of the water level monitoring stations is given in **Table-1**.

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

S No	Districts	Number of Water Level Monitoring Stations		Total
		May, 2025		
		Dug wells	Piezometers	
1	Agra	7	12	19
2	Aligarh	9	4	13
3	Ambedkar Nagar	9	16	25
4	Amethi	36	2	38
5	Amroha	0	9	9
6	Auraiya	8	2	10
7	Ayodhya	12	5	17
8	Azamgarh	22	10	32
9	Baghpat	2	8	10
10	Bahraich	22	16	38
11	Ballia	20	3	23
12	Balrampur	19	9	28
13	Banda	11	18	29
14	Bara Banki	52	4	56
15	Bareilly	12	4	16
16	Basti	16	3	19
17	Bhadohi	7	0	7
18	Bijnor	7	13	20
19	Budaun	0	9	9
20	Bulandshahr	2	14	16
21	Chandauli	15	3	18

S No	Districts	Number of Water Level Monitoring Stations		Total
		May, 2025		
		Dug wells	Piezometers	
22	Chitrakoot	10	14	24
23	Deoria	32	1	33
24	Etah	2	4	6
25	Etawah	10	2	12
26	Farrukhabad	1	4	5
27	Fatehpur	12	14	26
28	Firozabad	0	5	5
29	Gautam Buddha Nagar	0	8	8
30	Ghaziabad	1	3	4
31	Ghazipur	22	11	33
32	Gonda	25	5	30
33	Gorakhpur	17	15	32
34	Hamirpur	13	11	24
35	Hapur	0	4	4
36	Hardoi	17	6	23
37	Hathras	4	4	8
38	Jalaun	34	5	39
39	Jaunpur	29	8	37
40	Jhansi	20	2	22
41	Kannauj	10	2	12
42	Kanpur Dehat	13	1	14
43	Kanpur Nagar	20	1	21

S No	Districts	Number of Water Level Monitoring Stations		Total
		May, 2025		
		Dug wells	Piezometers	
44	Kasganj	4	11	15
45	Kaushambi	10	2	12
46	Kheri	26	5	31
47	Kushinagar	29	0	29
48	Lalitpur	19	4	23
49	Lucknow	16	15	31
50	Maharajganj	14	1	15
51	Mahoba	15	6	21
52	Mainpuri	3	5	8
53	Mathura	19	3	22
54	Mau	13	3	16
55	Meerut	2	12	14
56	Mirzapur	26	0	26
57	Moradabad	5	6	11
58	Muzaffarnagar	2	11	13
59	Pilibhit	10	3	13
60	Pratapgarh	29	2	31
61	Prayagraj	38	0	38
62	Rae Bareli	30	5	35
63	Rampur	4	6	10
64	Saharanpur	7	11	18
65	Sambhal	0	12	12

S No	Districts	Number of Water Level Monitoring Stations		Total
		May, 2025		
		Dug wells	Piezometers	
66	Sant Kabir Nagar	10	1	11
67	Shahjahanpur	3	0	3
68	Shamli	0	4	4
69	Shrawasti	13	6	19
70	Siddharthnagar	16	10	26
71	Sitapur	42	5	47
72	Sonbhadra	22	0	22
73	Sultanpur	34	3	37
74	Unnao	29	5	34
75	Varanasi	12	2	14
Grand Total		**1082**	**453**	**1535**

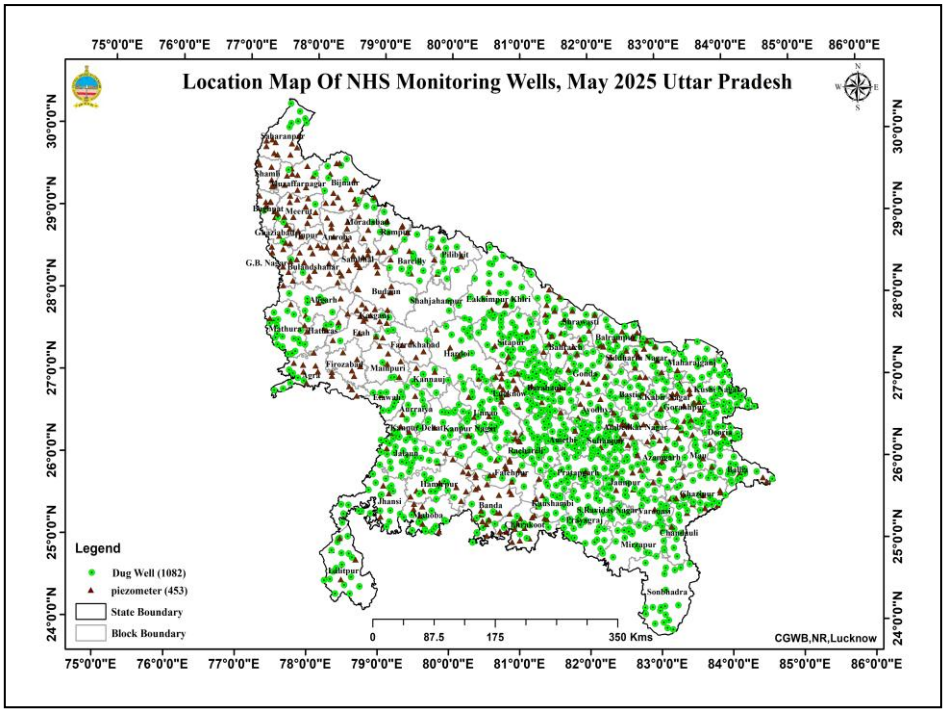

Figure-2: Map showing location of monitoring wells (NHNS) in the state during Pre-monsoon 2025

4.0. RAINFALL

The district wise monthly grided rainfall data collected from Indian Meteorological Department; were used to analyzed the rainfall pattern. Table-2 gives the district wise normal rainfall and actual rainfall of Pre-monsoon 2023 and Pre-monsoon 2024 with the departure from normal rainfall.

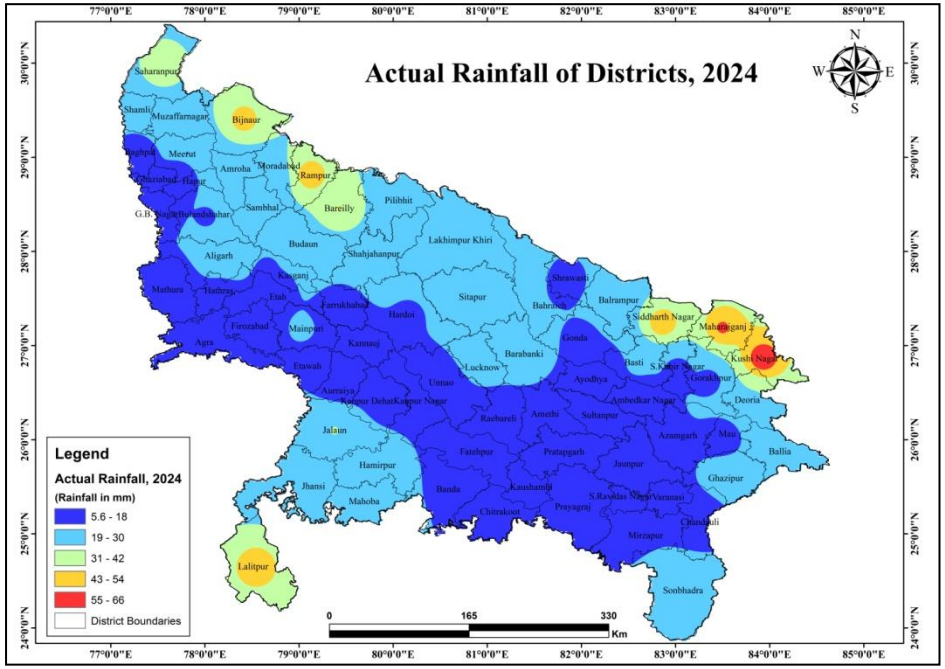

Figure-3: Actual Rainfall of the district during the period of March–May, 2024

Table-2: District wise variability of rainfall in Uttar Pradesh (2024)

S.No	District	Normal rainfall (mm)	Actual rainfall (mm) 2023	Deviation %	Actual rainfall (mm) 2024	Deviation %	% Deviation 2024 To 2023
1	Agra	24.5	65.69	168.12	8.23	-66.41	-698.18
2	Aligarh	29.9	87.68	193.24	19.18	-35.85	-357.14
3	Ambedkar nagar	35.5	49.37	39.07	7.92	-77.69	-523.36
4	Auraiya	23.4	34.96	49.40	8.96	-61.71	-290.18
5	Ayodhya	29.8	49.18	65.03	8.58	-71.21	-473.19
6	Azamgarh	29.6	39.85	34.63	17.04	-42.43	-133.86
7	Baghpat	32.7	108.1	230.58	12.67	-61.25	-753.20
8	Bahraich	47.6	90.18	89.45	25.7	-46.01	-250.89
9	Ballia	29.9	47.03	57.29	20.5	-31.44	-129.41
10	Balrampur	60	37.98	-36.70	24.4	-59.33	-55.66
11	Banda	18.5	54.78	196.11	16.87	-8.81	-224.72
12	Barabanki	26.9	86.88	222.97	24.7	-8.18	-251.74
13	Bareilly	35.9	186.4	419.22	42.18	17.49	-341.92
14	Basti	42.9	36.43	-15.08	18.66	-56.50	-95.23
15	Bijnor	45.6	161	253.07	48.79	7.00	-229.99
16	Budaun	29.2	83.23	185.03	27.88	-4.52	-198.53
17	Bulandshahr	28.8	109.11	278.85	17.06	-40.76	-539.57
18	Chandauli		78.94		12.48		-532.53
19	Chitrakoot		73.82		14.89		-395.77
20	Deoria	51.4	59.97	16.67	29.3	-43.00	-104.68
21	Etah	27.7	56.31	103.29	14.08	-49.17	-299.93
22	Etawah	24.9	41.13	65.18	17.46	-29.88	-135.57
23	Farrukhabad	26.8	57.43	114.29	12.07	-54.96	-375.81

S.No	District	Normal rainfall (mm)	Actual rainfall (mm) 2023	Deviation %	Actual rainfall (mm) 2024	Deviation %	% Deviation 2024 To 2023
24	Fatehpur	19.9	28.6	43.72	5.55	-72.11	-415.32
25	Firozabad	21.2	66.57	214.01	13.73	-35.24	-384.85
26	Gautam Buddhanagar		77.37		16.09		-380.86
27	Ghaziabad	36.3	96.55	165.98	12.67	-65.10	-662.04
28	Ghazipur	25.4	58.55	130.51	21.44	-15.59	-173.09
29	Gonda	37.6	63.01	67.58	15.5	-58.78	-306.52
30	Gorakhpur	60.3	43.84	-27.30	12.99	-78.46	-237.49
31	Hamirpur	13.6	53.35	292.28	24.73	81.84	-115.73
32	Hardoi	30.7	63.34	106.32	16.39	-46.61	-286.46
33	Jalaun	17.1	41.01	139.82	30.47	78.19	-34.59
34	Jaunpur	23.1	73.56	218.44	9.28	-59.83	-692.67
35	Jhansi	17	22.93	34.88	27.65	62.65	17.07
36	Amroha	34.4	154.36	348.72	21.31	-38.05	-624.35
37	Kannauj		72.06		11.31		-537.14
38	Kanpurdehat	19.3	55.99	190.10	12.24	-36.58	-357.43
39	Kanpurnagar	17.1	67.27	293.39	14.74	-13.80	-356.38
40	Kasganj		53.34		16.5		-223.27
41	Kaushambi		54.72		10.72		-410.45
42	Kheri	49.8	98.48	97.75	20.57	-58.69	-378.76
43	Kushinagar	68.8	45.3	-34.16	66.15	-3.85	31.52
44	Lalitpur	17.8	31.14	74.94	49.27	176.80	36.80
45	Lucknow	25.3	87.98	247.75	23.31	-7.87	-277.43
46	Mahmaya Nagar (Hathras)	22.7	70.16	209.07	17.17	-24.36	-308.62
47	Maharajganj	74.9	51.7	-30.97	56.5	-24.57	8.50
48	Mahoba		52.95		24.65		-114.81
49	Mainpuri	23.4	60.66	159.23	18.27	-21.92	-232.02
50	Mathura	17.5	82.22	369.83	11.36	-35.09	-623.77
51	Mau	33.6	31.24	-7.02	11.36	-66.19	-175.00
52	Meerut	39.4	165.06	318.93	17.66	-55.18	-834.65
53	Mirzapur	17.6	62.22	253.52	17.51	-0.51	-255.34
54	Moradabad	35.8	141.44	295.08	19.95	-44.27	-608.97
55	Muzaffarnagar	30.7	164.88	437.07	29.38	-4.30	-461.20
56	Pilibhit	38.8	144.29	271.88	26.08	-32.78	-453.26
57	Pratapgarh		68.65		10.2		-573.04
58	Prayagraj	18.5	59.7	222.70	8.93	-51.73	-568.53
59	Rae Bareli	18.6	47.94	157.74	12.18	-34.52	-293.60
60	Rampur	53.1	190.89	259.49	52.45	-1.22	-263.95
61	Saharanpur	41.4	164.25	296.74	34.72	-16.14	-373.07
62	Sant Kabir Nagar		35.36		13.06		-170.75
63	Sant Ravi Das Nagar	25.1	108.75	333.27	14.97	-40.36	-626.45
64	Shahjahanpur	35.7	79.1	121.57	29.75	-16.67	-165.88
65	Shrawasti	47.6	51.09	7.33	11.04	-76.81	-362.77
66	Siddharth Nagar	51.9	31.92	-38.50	54.01	4.07	40.90
67	Sitapur	33	86.74	162.85	18.92	-42.67	-358.46
68	Sonbhadra	32	46.55	45.47	26.65	-16.72	-74.67
69	Sultanpur	27.4	70.46	157.15	10.91	-60.18	-545.83
70	Unnao	20.4	64.72	217.25	12.05	-40.93	-437.10
71	Varanasi	24.7	85.49	246.11	17.47	-29.27	-389.35
	Average	**32.26**	**74.97**	**158.07**	**20.84**	**-28.19**	**-329.33**

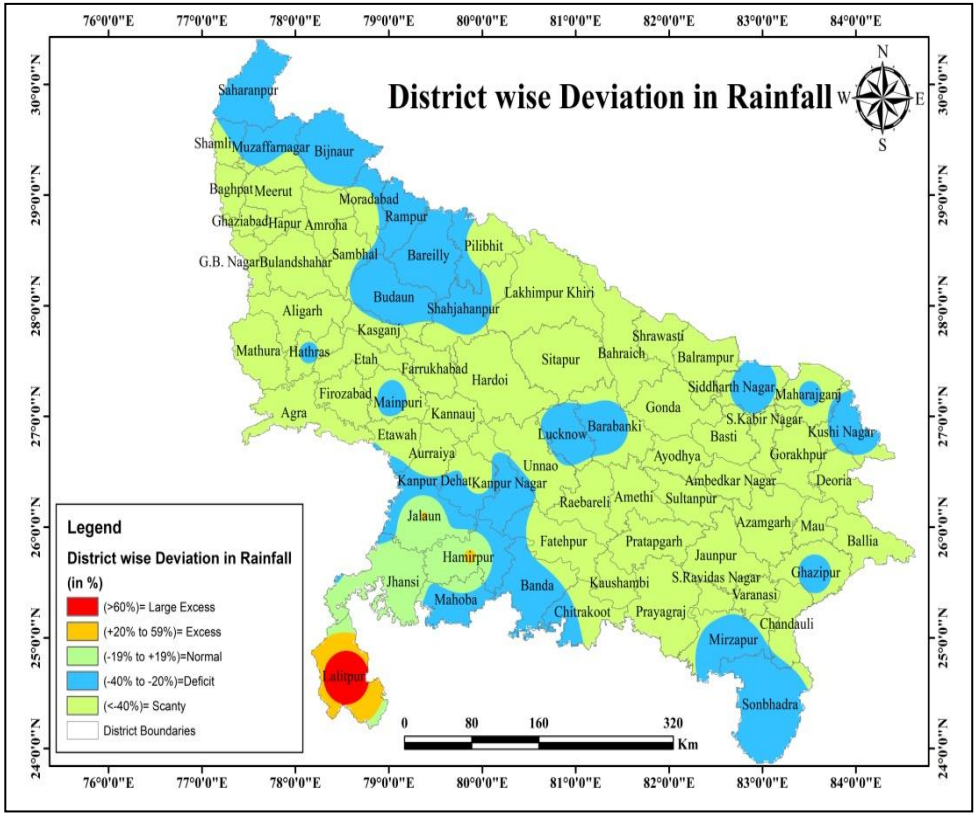

Figure-4: District wise Rainfall deviation % during the period of March–May,2024

5.0. GROUNDWATER LEVEL SCENARIO

5.1. UNCONFINED AQUIFER

5.1.1 DEPTH TO WATER LEVEL DATA

Depth To Water Level in Unconfined Aquifer (Pre-monsoon 2025)

The depth to water level of 968 wells is used for the analysis. It shows that water levels vary between 0.65 mbgl (Balrampur district) to 43.97 mbgl (Agra district). Water levels of less than 2 mbgl are recorded in 1.75% of wells, between 2 to 5 mbgl in 35.12% of wells, between 5 to 10 mbgl in 46.48% of wells, between 10 to 20 mbgl in 13.73% of wells, between 20-30 mbgl in 2.48% of well and water level between 30-45 mbgl is registered in 0.41% of wells. Percentage of wells shown in Figure No.-6 for unconfined aquifers and Map showing Depth to Water level of unconfined aquifers is shown in Figure – 5. Shallow water levels of less than 2 mbgl is seen in isolated patches in parts of Bareilly, Bahraich, Mathura, Aligarh, Sitapur, Balrampur, Farrukhabad, Jalaun, Sonbhadra, Unnao, Agra districts of the State. Water level of 2 to 5 mbgl is majorly observed in the parts of Saharanpur, Bijnor, Moradabad, Rampur, Bareilly, Pilibhit, Shahjahanpur, Lakhimpur Kheri, Sitapur, Shrawasti, Bahraich, Balrampur, Gonda, Siddharth Nagar, Basti, Sant Kabir Nagar, Gorakhpur, Maharajganj, Kushinagar, Deoria, Mau, Ballia and isolated patches are seen in the parts of Mathura, Aligarh, Etah, Aurriya, Ghazipur, Chandauli, Sonbhadra, Mirzapur, Varanasi, Prayagraj, Jaunpur, Sultanpur, Amethi,

Raebareli, Barabanki, Unnao, Kanpur Nagar, Kannauj, Etawah, Mainpuri, Hardoi, Lalitpur, Mahoba districts of Uttar Pradesh .

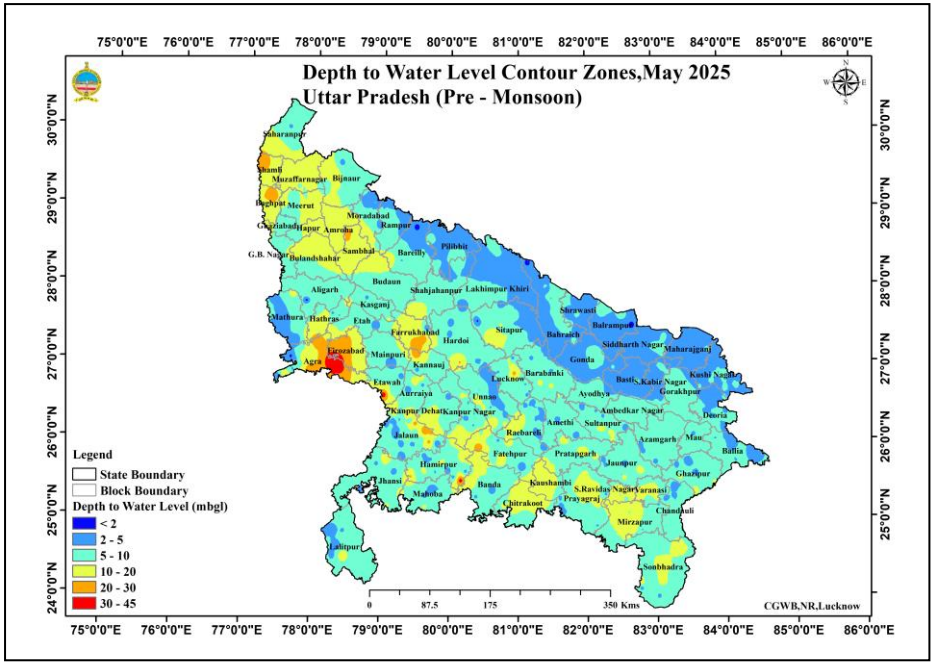

Figure-5: Depth to water level of Unconfined Aquifer during Pre-monsoon 2025

Depth to water level of 5 to 10 mbgl which is observed mainly in Central region, Eastern region and Bundelkhand regions of UP along with isolated patches of Saharanpur, Shamli, Bijnor, Meerut, Ghaziabad, Bulandshahr, Gautam Budh Nagar, Budaun, Bareilly, Aligarh, Hathras, Etah, Kasganj, Shahjahanpur, Farrukhabad, Mainpuri and Etawah districts

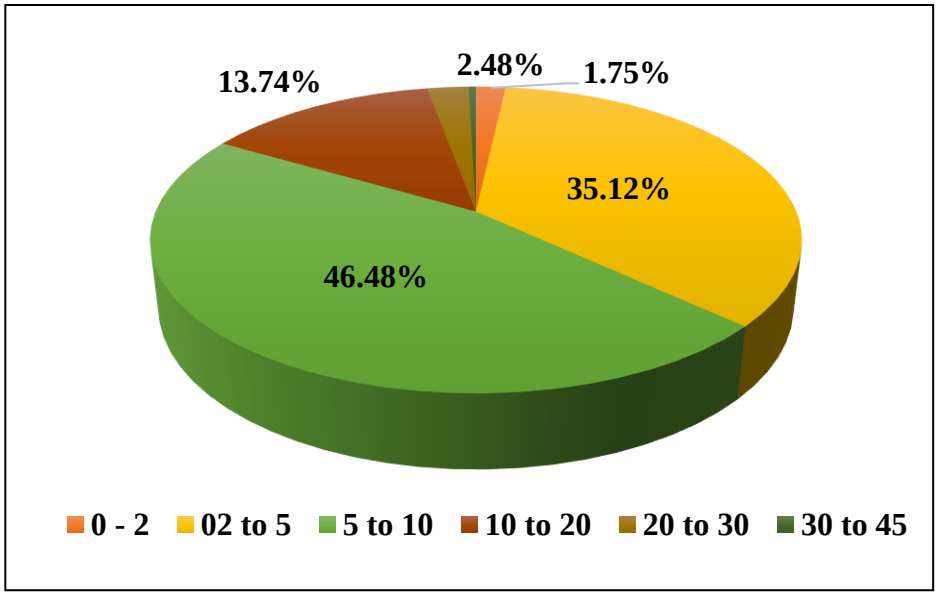

Figure-6: Percentage of wells in different water level ranges in Unconfined Aquifer

Water level of 10 to 20 mbgl and are observed in parts of Saharanpur, Shamli, Baghpat, Ghaziabad, Muzaffarnagar, Bijnor, Meerut, Hapur, Amroha, Sambhal, Gautam Budh Nagar, Bulandshahr, Budaun, Shahjahanpur, Farrukhabad, Etah, Hathras, Mathura, Agra, Firozabad, Mainpuri, Etawah, Auraiya, Kanpur Dehat , Kanpur Nagar, Jalaun, Hamirpur, Mahoba, Banda, Fatehpur, Raebareli, Sitapur, Unnao, Lucknow, Kaushambi, Chitrakoot, Pratapgarh, Prayagraj, Mirzapur, Varanasi, Ghazipur, Sonbhadra districts of UP. Depth to Water level 20

to 30 mbgl are observed mainly in Shamli, Baghpat, Agra, Sambhal, Firozabad, Farrukhabad, Jalaun, Etawah, Fatehpur and Hamirpur districts. Deeper Water level greater than 30 mbgl are observed in Agra, Firozabad, Etawah and Hamirpur districts of UP.

5.1.2 ANNUAL FLUCTUATION IN WATER LEVEL

Annual Fluctuation of Water Level in Unconfined Aquifer (Pre-Monsoon 2024 to Pre-Monsoon 2025)

Rise in Water Levels: Out of 565 wells analyzed, it is observed that, the rise in water level of less than 2m is recorded in 326 wells (57.7%), 2 to 4 in 24 wells (4.24%) and more than 4 m in 3 wells (0.53%).Water level rise of less than 2m is seen in Central Region and Eastern parts of UP along with the parts of Saharanpur, Meerut, Gautam Budh Nagar, Bulandshahr, Sambhal districts of UP and Bundelkhand region of UP. Water level rise of 2 to 4 m is observed mainly in the parts of Kanpur Dehat, Kanpur Nagar, Banda, Fatehpur, Sonbhadra, Mirzapur and Ghazipur districts of UP. Rise of more than 4m is significantly observed in Mathura, Agra, Banda and Sonbhadra districts.

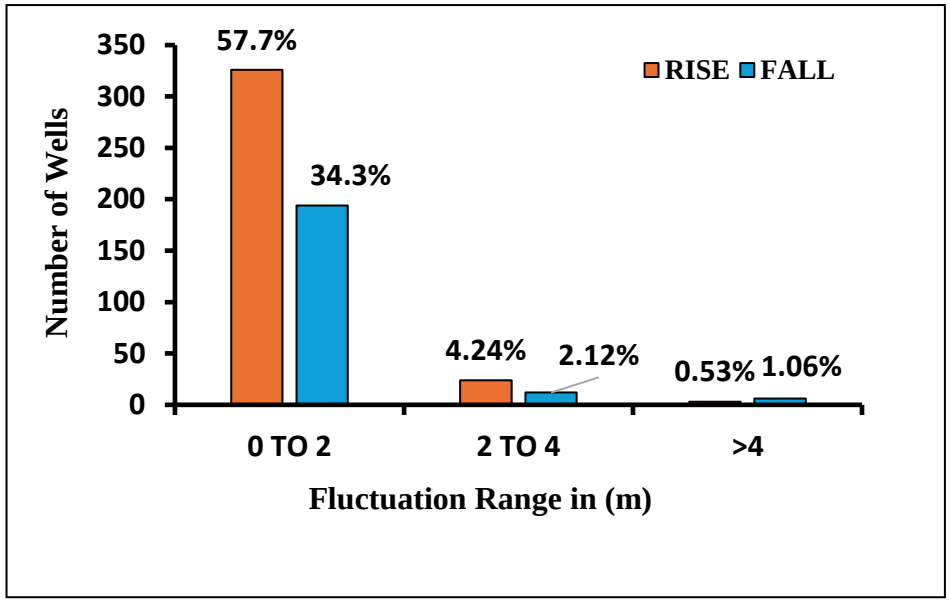

Figure-7: Percentage of wells showing rise and fall in WL in Unconfined Aquifer (Pre-monsoon 2024 to Pre-monsoon 2025)

Fall in Water Levels:

Out of 565 wells analyzed, 194 wells (34.3%) shows fall in water levels of less than 2m , while 12 wells (2.12%) are in the range of 2 to 4m and remaining 6 wells (1.06%) shows fall of more than 4m. Fall of less than 2m is mainly observed in parts of Shamli, Muzaffarnagar, Bijnor, Baghpat, Meerut, Ghaziabad, Hapur, Amroha, Moradabad, Rampur, Mathura, Pilibhit, Hardoi, Lakhimpur Kheri, Aligarh, Sitapur, Barabanki,

Fatehpur, Kanpur nagar, Kanpur Dehat, Lalitpur, Jhansi, Mahoba, Banda, Jalaun, Chitrakoot, Kaushambi, Prayagaraj, Mirzapur, Jaunpur, Ghazipur, Chaundauli, Sonbhadra, Deoria and Ballia districts of UP.

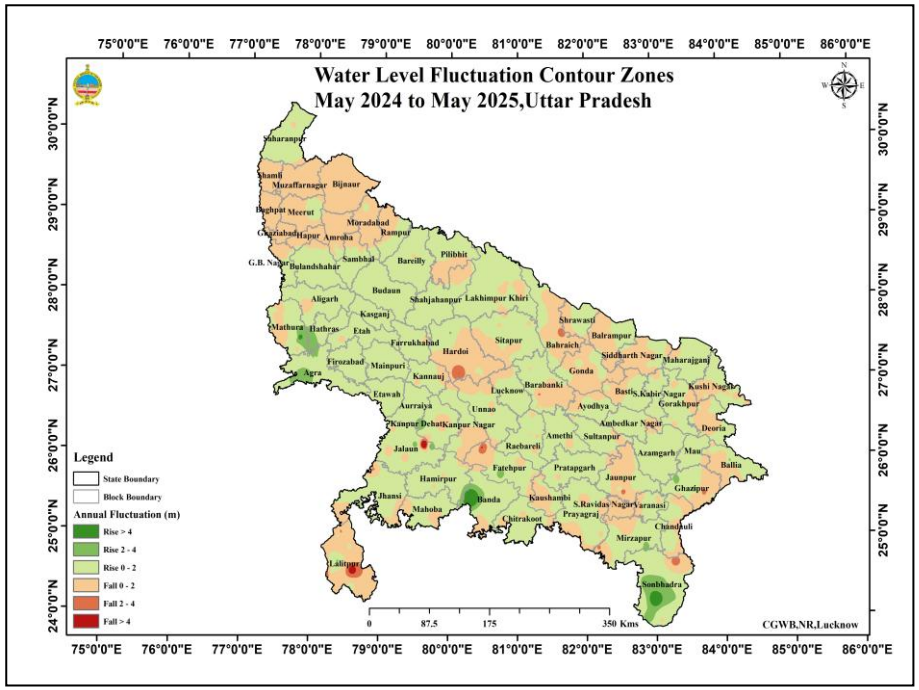

Figure-8: Annual water level fluctuation in Unconfined aquifer (Pre-monsoon 2024 to Pre-monsoon 2025)

Fall of 2 to 4 m is observed mainly in isolated patches of Hardoi, Jalaun, Lalitpur, Jaunpur, Sonbhadra, Bahraich and Barabanki, districts of UP. Fall of more than 4m is observed in isolated patches of Lalitpur, Jalaun, Hardoi and Fatehpur districts. Map of Annual water level fluctuation in unconfined aquifer (Pre-monsoon 2024 -Pre-monsoon 2025) is shown in Figure- 8 and Percentage of wells showing rise and fall in WL for Unconfined aquifer (Pre-monsoon 2024 -Pre-monsoon 2025) in Figure – 7.

Annual Fluctuation of Water Level in Unconfined Aquifer (Pre-monsoon 2023 to Pre-monsoon 2025)

Rise in Water Levels: Out of 426 wells analyzed, it is observed that, the rise in water level of less than 2m is recorded in 141 wells (32.64%) 2 to 4 in 15 wells (3.47%) and more than 4m in 3 wells (0.69%). Water level rise of less than 2m is seen in parts of Muzaffarnagar, Bulandshahr, Sambhal, Rampur, Aligarh, Budaun, Hathras, Kasganj, Etah, Agra, Firozabad, Mainpuri, Etawah, Kannauj, Aurriya, Lalitpur, Jhansi, Hamirpur, Mahoba, Banda, Chitrakoot, Fatehpur, Rai bareilly, Amethi, Pratapgarh, lucknow, Barabanki, Gonda, Balrampur, Shravasti, Siddharath nagar, Basti, Sant Kabir nagar, Maharaganj, Deoria, Ballia, Kushinagar, Azamgarh, Mau, Ghazipur, Varansi, Chandauli, Mirzapur and Sonbhadra districts. Water level rise of 2 to 4 m is observed mainly in isolated pathes of Etawah, Aurriaya, Amethi, Siddharath nagar, Sonbhadra and Ballia districts of UP. Rise of more than 4m is significantly observed in Sonbhadra, Etawah and Aurriaya districts of Uttar Pradesh.

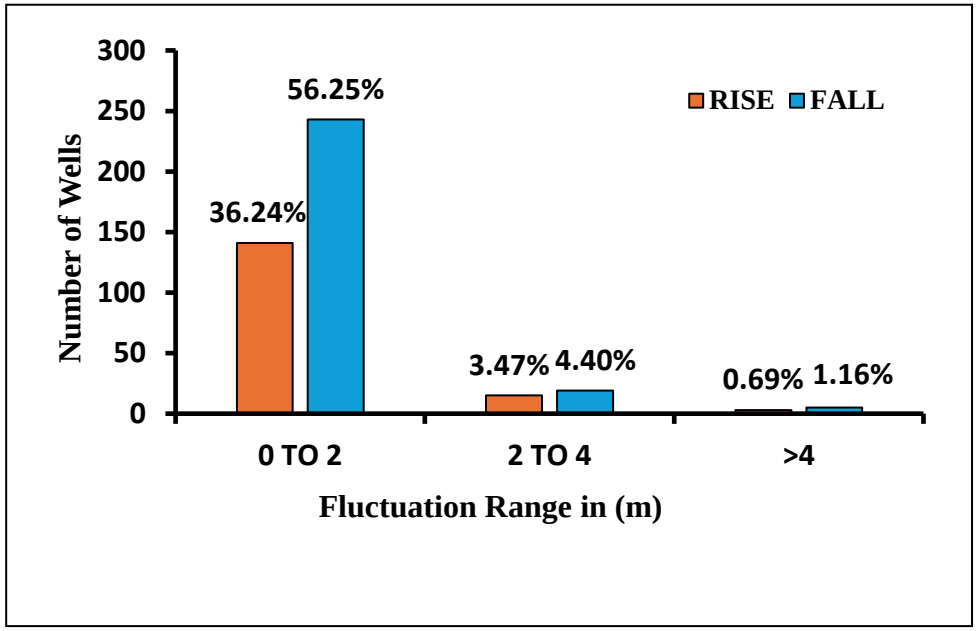

Figure-9: Percentage of wells showing rise and fall in WL in Unconfined Aquifer (Pre-monsoon 2023 to Pre-monsoon 2025)

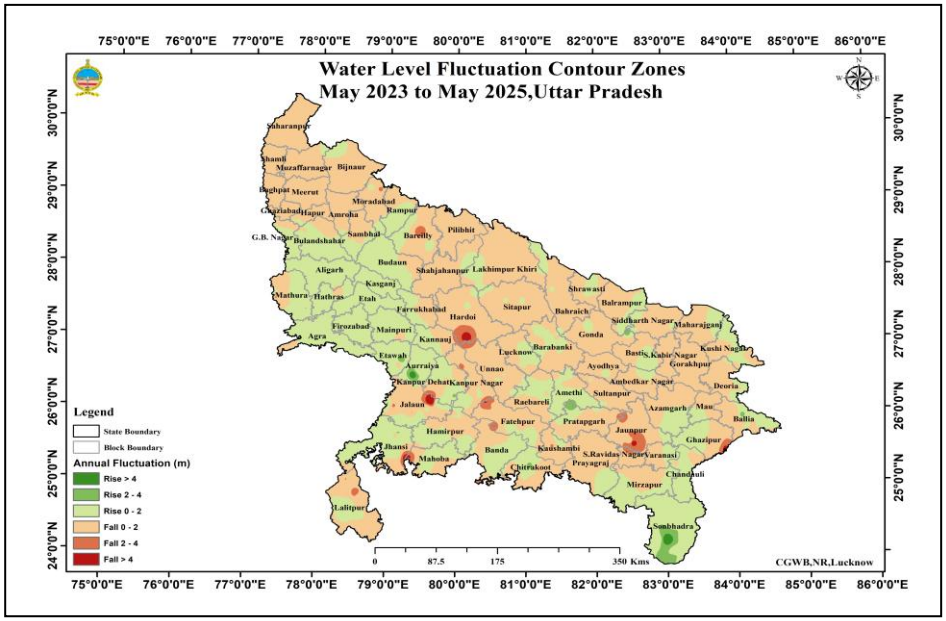

Figure-10: Annual water level fluctuation in Unconfined aquifer (Pre-monsoon 2023 to Pre-monsoon 2025)

Fall in Water Levels:

Out of 426 wells analyzed, 243 wells (56.25%) recorded water level of less than 2m fall, while 19 wells (4.44%) are in the range of 2 to 4m and remaining 5 wells (1.16%) shows fall of more than 4m. Fall of less than 2m is mainly observed in North-Western region, Terai region and Bundelkhand region of UP along with isolated patches of Mathura, Mau, Ghazipur, Ballia, Sant Kabir Nagar, Gorakhpur, Ambedkar nagar, Sultanpur, Kushinagar, Deoria, Banda, Chitrakoot, Kaushambi, Prayagraj, Pratapgarh, Jaunpur and Varanasi districts of UP.

Fall of 2 to 4 m is observed mainly in isolated patches of Bareilly, Hardoi, Jalaun Mahoba, Lalitpur, Kanpur Nagar, Fatehpur, Pratapgarh, Jaunpur, and Ghazipur districts of UP. Fall of more than 4m is observed in isolated patches of Hardoi, Jalaun, Fatehpur, Jhansi, Mahoba, Jaunpur and

Ghazipur districts of UP. Map of Annual water level fluctuation in unconfined aquifer (Pre-monsoon 2023 -Pre-monsoon 2025) is shown in Figure- 10 and Percentage of wells showing rise and fall in WL for Unconfined aquifer (Pre-monsoon 2023 to Pre-monsoon 2025) in Figure – 9

5.1.3 DECADAL FLUCTUATION IN WATER LEVEL

Decadal Fluctuation of Water Level in Unconfined Aquifer (Decadal Mean Pre-Monsoon (2015-2024) to Pre-Monsoon 2025)

Rise in Water Levels:

Out of 285 analyzed wells, the rise in water level of less than 2m is recorded in 125 wells (43.86%), 2 to 4 m in 11 wells (3.86 %) and more than 4m in 4 wells (1.4%). Water level rise of less than 2m is seen mainly in North-Western and Bundelkhand region of UP. It is also seen in parts of Shravasti, Balrampur, Basti, Sant Kabir Nagar, Ambedkar Nagar, Azamgarh, Mau, Ghazipur, Jaunpur, Varanasi, Chandauli, Mirzapur, Sonbhadra and Chitrakoot regions. Water level rise of 2 to 4 m is observed mainly in isolated patches of Auraiya, Jalaun, Hamirpur, Jhansi, Chitrakoot, Varanasi, Sonbhadra and Ballia districts and rise of more than 4m is significantly observed in isolated patches of Jalaun and Varanasi districts of UP.

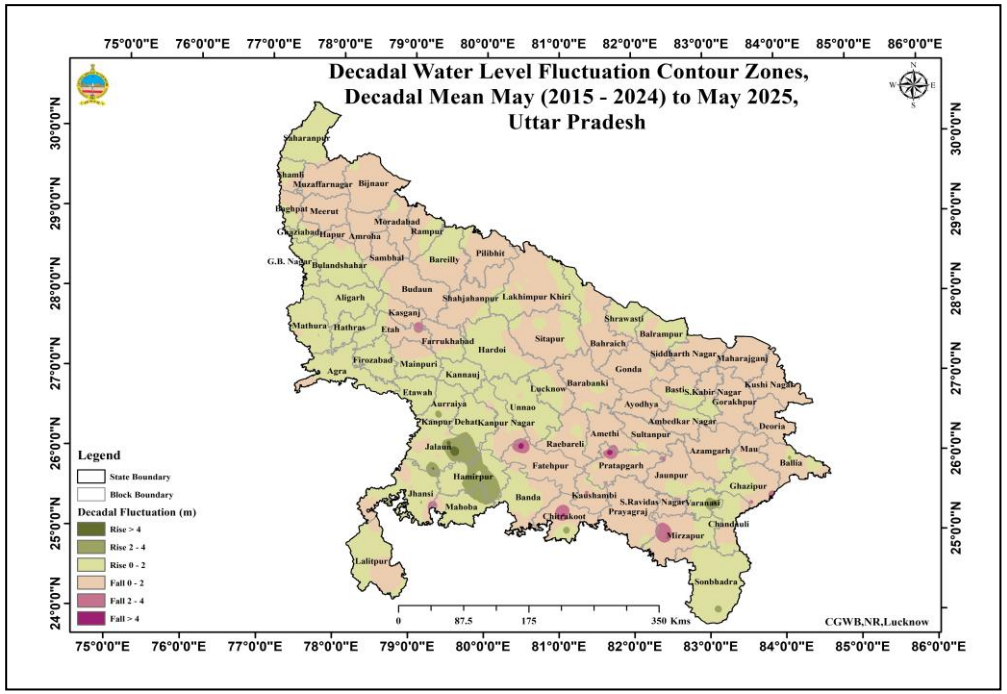

Figure-11: Decadal water level fluctuation in Unconfined Aquifer (Decadal Mean Pre-monsoon (2015-2024) to Pre-monsoon 2025)

Fall in Water Levels:

Out of the 285 analyzed wells, 133 wells (46.67%) of the area shows, fall in water levels of less than 2m while 9 wells (3.16%) in the range of 2 to 4m and remaining 3 wells (1.05%) wells registered water level fall of more than 4m. Fall of less than 2 m is observed in major parts of Eastern, Central and Terai regions of Uttar Pradesh. Also, in parts of Jalaun, Jhansi,

Lalitpur, Banda and Chitrakoot districts. Fall of 2 to 4m is observed in isolated patches of Kasganj, Etah, Fatehpur, Chitrakoot, Jhansi, Mahoba, Amethi, Pratapgarh, Kaushambi, Jaunpur, Mirzapur and Ghazipur districts of UP. Fall more than 4m is observed in isolated patches of Fatehpur, Pratapgarh and Chitrakoot districts. Map of Decadal Water level fluctuation in Unconfined Aquifer (Decadal Mean Pre-monsoon (2015-2024) to Pre-monsoon 2025) is shown in the Figure – 11 and percentage of wells showing rise and fall in WL for Unconfined Aquifer (Decadal Mean Pre-monsoon (2015-2024) to Pre-monsoon 2025) is shown in Figure-12.

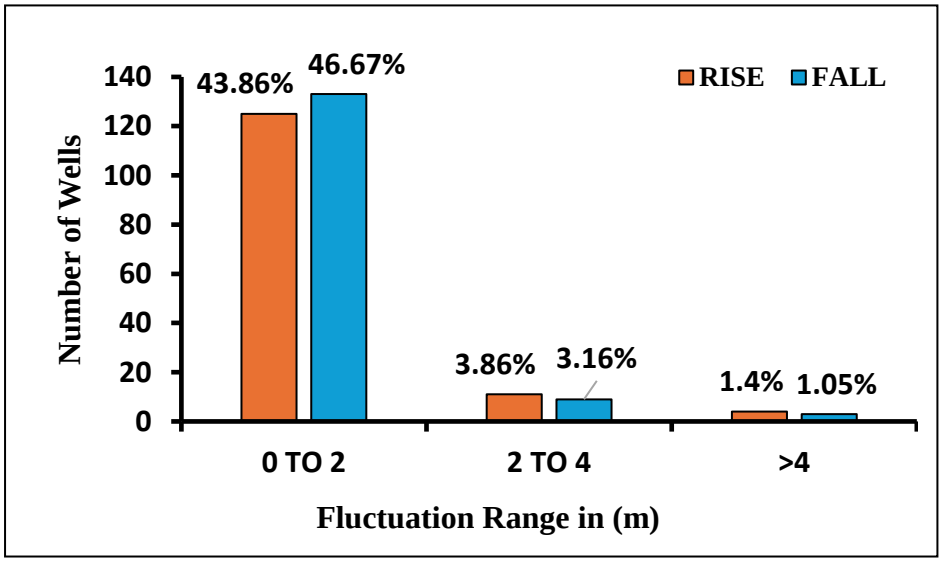

Figure-12: Percentage of wells showing rise and fall in WL in Unconfined Aquifer (Decadal Mean Pre-monsoon (2015-2024) to Pre-monsoon 2025)

6.0. SUMMARY

As a component of the National Ground Water Monitoring Programme, the CGWB, NR, Lucknow conducts monitoring of the ground water conditions on a quarterly basis: in January, pre-monsoon May, August, and post-monsoon November. Additionally, a yearly assessment of ground water quality is performed in May. As of May 31, 2025, the Northern Region-Central Ground Water Board supervises 1082 dug wells and 453 piezometers. This comprehensive effort aims to portray the variations in the states ground water conditions across different aquifers. In May 2025, around 82% of the State's area exhibited a depth to water level within 10 meters below ground level covering regions like Saharanpur, Bijnore, Moradabad, Rampur, Bareilly, Pilibhit, Shahjahanpur, Lakhimpur Kheri, Sitapur, Shrawasti, Bahraich, Balrampur, Gonda, Siddharth Nagar, Basti, Sant Kabir Nagar, Gorakhpur, Maharajganj, Kushinagar, 13.74% area of state shows depth to water level 10 to 20 mbgl which is seen in Shamli, Baghpat, Ghaziabad, Muzaffarnagar, Bijnor, Meerut, Hapur, Amroha, Sambhal, Gautam Budh Nagar districts and nearly 3% area exhibits DTW greater than 20 mbgl for unconfined aquifers which is observed in Shamli, Baghpat, Agra, Sambhal, Firozabad, Farrukhabad, Jalaun, Etawah, Fatehpur districts of UP.

The ground water level in Uttar Pradesh during May 2024 has been

significantly influenced by rainfall patterns from March 2025 to May 2025. The annual water level comparison with the year May-2024 to May-2025 has shown fall in about 37% area of the State in Unconfined aquifer which covers regions like Shamli, Muzaffarnagar, Bijnor, Baghpat, Meerut, Ghaziabad, Hapur, Amroha, Moradabad, Rampur, Mathura, Pilibhit, Hardoi, Lakhimpur Kheri, Aligarh, Sitapur, Barabanki, Fatehpur, Kanpur nagar, Kanpur Dehat, Lalitpur etc. The annual water level comparison with the year May-2023 to May-2025 has shown fall in about 62% area of the state in unconfined aquifer observed in Mau, Ghazipur, Ballia, Sant Kabir Nagar, Gorakhpur, Ambedkar nagar, Sultanpur, Kushinagar, Deoria, Banda, Chitrakoot, Kaushambi, Prayagraj, Pratapgarah, Jaunpur districts. Around 48% of the area experienced rise of water level in decadal mean water level fluctuation of May, 2015-2024, with respect to May,2025, in unconfined aquifer, which is observed in districts like Sant Kabir Nagar, Ambedkar Nagar, Azamgarh, Mau, Ghazipur, Jaunpur of Uttar Pradesh The monsoon in 2024 witnessed significant fluctuations in rainfall pattern across the state. Rainfall distribution varied with major regions of Uttar Pradesh receiving deficit in rainfall.

7.0. RECOMMENDATIONS

- 62% of the well are showing fall in Groundwater in comparison with May 2023 mainly in Shamli, Muzaffarnagar, Bijnor, Baghpat, Meerut, Ghaziabad, Hapur, Mau, Ghazipur, Ballia, Sant Kabir Nagar, Gorakhpur, Ambedkar nagar, Sultanpur, Kushinagar, Deoria, Banda, Chitrakoot, Kaushambi, Prayagraj, Pratapgarah, Jaunpur districts.
- State Government are suggested to adopt more water conservation measures to augment Groundwater water in the area. Rainwater harvesting and artificial recharge techniques, depending on the feasibility of Artificial Recharge Structure, may be introduced at a larger scale to minimize the problem of declining water level and depletion of GW resource.
- Demand side measure such as sprinkler, drip irrigation and Enhancement in cultivation of low water requiring crops and a small modification of the prevailing cropping pattern is recommendable as per its suitability for the area, needs to be promoted in the district like Shamli, Muzaffarnagar, Bijnor, Baghpat, Meerut, Ghaziabad, Hapur, Mau, Ghazipur, Ballia, Sant Kabir Nagar, Gorakhpur, Ambedkar nagar, Sultanpur, Kushinagar, Deoria, Banda, Chitrakoot, Kaushambi, Prayagraj, Pratapgarh, Jaunpur districts.

- Areas with deeper Groundwater levels showing declining trend in last ten year such as parts of Jalaun, Jhansi, Lalitpur, Banda, Kasganj, Etah, Fatehpur, Chitrakoot, Mahoba, Amethi, Pratapgarh, Kaushambi, Jaunpur, Mirzapur and Ghazipur. need overall increase in cultivation area of mustard, vegetables and wheat may be recommended as an alternative option as these crops are suitable for the local climate and soil type and need a lesser irrigation water column in the range of 0.40 to 0.45 m.