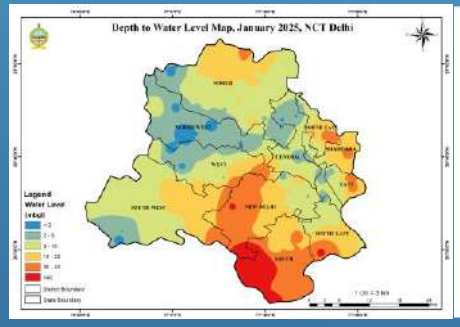
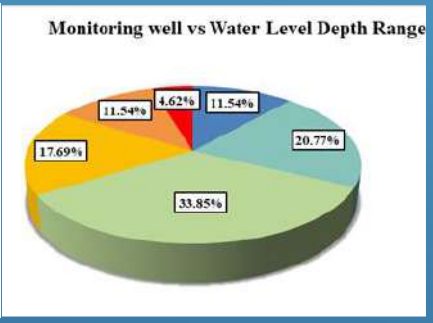
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
CENTRAL GROUND WATER BOARD





GROUND WATER LEVEL BULLETIN
JANUARY 2025
STATE UNIT OFFICE, NEW DELHI

CENTRAL GROUND WATER BOARD, STATE UNIT OFFICE
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GROUNDWATER LEVEL SCENARIO DURING JANUARY – 2025 IN NCT, DELHI HIGHLIGHTING THE FINDINGS, STATUS OF GROUNDWATER LEVEL IN DIFFERENT AQUIFERS, AND ITS SEASONAL, ANNUAL, AND DECADAL COMPARISON

CENTRAL GROUND WATER BOARD
STATE UNIT OFFICE, DELHI

1.0 INTRODUCTION

Ground water is among the Nation's most precious natural resources. Measurements of water levels in wells provide the most fundamental indicator of the status of this resource and are critical to meaningful evaluations of the quantity and quality of groundwater and its interaction with surface water. Water-level measurements are made by Central Ground Water Board four times a year manually but the measurements in November are quite crucial as they provide the overall impact of post monsoon ground water behavior and ground water withdrawal for drinking and domestic purpose which counts nearly 75% of its drinking and domestic demands during this period only. Recently CGWB has installed Automatic Water Level Recorders in selected Piezometers to get the real time water levels of NCT, Delhi.

2.0 STUDY AREA

The State Unit Office of Central Ground Water Board Delhi has jurisdiction over the National Capital Territory (NCT) of Delhi, covering an area of 1483 Sq.km and lies between 28°24'15'' & 28°53'00'' North Latitudes and 76°50'24" & 77°20'30" East Longitudes, covered under Survey of India Topo-sheet Nos. 53D and 53H. The NCT of Delhi is surrounded on three sides by two States, i.e., on North, West and South by Haryana and in the East by Uttar Pradesh. NCT of Delhi is divided into 11 Revenue District and one non-revenue unit along river Yamuna, named as Nazul Land. As per District Census Hand Book, 11 districts of NCT of Delhi are further subdivided into 3 Tehsils for each district and there are total 33 Tehsils, with 112 villages, 110 Census Town and 3 Statutory Towns.

The rock formations exposed in the National Capital Territory of Delhi are mainly quartzite of Alwar series of the Delhi Super group that are inter-bedded with thin micaceous schist bands. Proterozoic rocks occur along the ridge, extending from Harchandpur (Haryana) in the South to Wazirabad (Delhi) in the North. Quaternary sediments directly overlie the Proterozoic rocks.

The Delhi Quartzite ridge acts as the recharge zone. The Quaternary deposits in the form of aeolian and alluvial deposits constitute the major repository of ground water in the area. In theEast of the ridge, the thickness of unconsolidated sediments gradually increases away from the ridge, with the maximum reported thickness being 170 m.

3.0 BEHAVIOUR OF WATER LEVEL

In the Southwestern, Western and Northern parts of the area, the thickness of sediments is more than 300 m except at Dhansa where the bedrock has been encountered at 297 m below land surface. In Chhattarpur basin, the maximum thickness of sediments is 116 m. The aeolian deposits are mainly comprised of loam, silty loam and sandy loam. The bedrock is overlain by these deposits. Older alluvial deposits consist mostly of interbedded, lenticular and inter fingering deposits of clay, silt, andsand along with kankar. These deposits overlay the aeolian deposits and are in turn overlain bythe newer alluvium, which occurs mostly in the flood plains of river Yamuna (***Figure 1***).

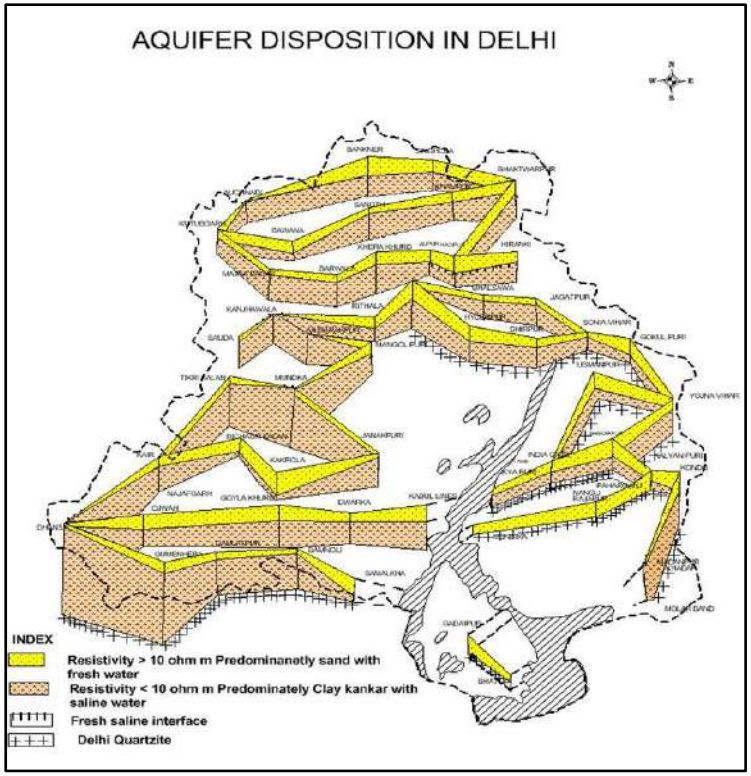

Figure 1 : Panel Diagram showing Aquifer Disposition in NCT of Delhi

To meticulously evaluate the quantitative shifts in groundwater resources, a comprehensive analysis was conducted by comparing water level data from November 2024 with that of May 2024, November 2023, and the decadal mean for November (2014-2023). This comparison enabled the calculation of Seasonal, Annual, and Decadal Mean Water Level Fluctuations. The ensuing discussion elucidates the behavioral dynamics of groundwater levels in November 2024, providing a critical examination of changes relative to the referenced temporal benchmarks.

3.1 RAINFALL

(source: https://mausam.imd.gov.in/newdelhi/mcdata/seasonal_report.pdf)

The rainfall data collected and compiled from monthly weather reports from Indian Meteorological Department were used to analyze the rainfall for the period of June 2024- September 2024. Monsoon withdrew from Delhi on 2nd October 2024 against its normal date of withdrawal 25th September (1971-2019). In the year 2024, the southwest monsoon (SWM) made its onset over Delhi on 28th June, 2024 against its normal onset date of 27th June (1961-2019). In last 124 years, the earliest onset of southwest monsoon was in 2008 when it arrived in Delhi on 15th June and most delayed onset was in 1987 when it arrived on 26th July. In Delhi, seasonal rainfall (June to September) in the monsoon 2024 was in the category of Large excess (departure of 61%) with actual rainfall 1029.9 mm against its normal value (1971-2020) of 640.4 mm. This year, Delhi received 7th highest seasonal rainfall in the monsoon season since 1901.

Table 1: Highest Seasonal Rainfall (June- September) over Delhi in 2024

S. No	Year	Seasonal Rainfall (in mm)
1	1933	1421.6
2	1964	1190.9
3	1975	1155.6
4	2003	1052.8
5	2010	1031.5
6	2021	1169.7
7	2024	1029.9

Table 2: The rainfall recorded during Monsoon season in NCT, Delhi 2024

S. No	Month	Rainfall (in mm)	Normal (1971-2020)	Departure (in %)	No. of Rainy Days (RF >2.4 mm)
1	June	243.3	74.1	228	3
2	July	203.7	209.7	-3	12
3	August	390.3	233.1	67	17
4	September	192.5	123.5	56	08

3.2 DEPTH TO WATER LEVEL: JANUARY 2025

The analysis of the water level behavior in January 2025, as illustrated in (***Figure 2),*** unveils critical insights into regional hydrological dynamics. The depth to water level map, serving as a pivotal tool in this evaluation, highlights significant variations in groundwater table depths across different locales.

In January 2025, the depth to the water level in Delhi exhibits a significant range, from a mere one meter below ground level in Rani Khera Dug Well within the Rohini tehsil in North West district to a substantial 68.46 mbgl in Sultanpur IMS in the Vasant Vihar in New Delhi district.

Notably, the areas which are characterized by extremely shallow water levels ranging from 0 to 2 mbgl, observed in 11.54% of monitoring wells, signify localized water logging within 2.04% of the state's area. Similarly, shallow water levels between 2 to 5 mbgl are recorded in 20.77% of wells encompassing 18.96% area across Kaspshera, Najafgarh, Khanjhawala, Punjabi Bagh, Rohini, Narela, Civil Line, Model Town, and Gandhi Nagar tehsils.

Depth to water level ranges of 5 to 10 mbgl is exhibited by 33.85% of the monitoring wells. These wells span 35.77% of the total area and are dispersed across Alipur, Chanakyapuri, Kapashera, Najafgarh, Narela, Patel Nagar, Preet Vihar, Punjabi Bagh, Saraswati Vihar, Karawal Nagar, Defence Colony, Gandhi Nagar, Mayur Vihar, Model town, and Seelampur. Moderate water levels, ranging from 10 to 20 mbgl, are observed in approximately 17.69% of wells, spanning 24.62% of the area in Chanakyapuri, Shahdara, Kapashera, Rajouri Garden, Karol Bhagh, Sarita Vihar, Alipur, Delhi Cantonment, Narela, Vivek Vihar, Najafgarh, Dwarka, Patel Nagar, Saket, Vasant Vihar, and Seemapuri. Deep water levels, ranging from 20 to 40 mbgl, are found in 11.54% of wells, covering 14.42% of the area in Delhi Cantonment, Yamuna Vihar, Mehrauli, Rajouri Garden, Saket, Patel Nagar, Hauz Khas, Dwarka, and Alipur. Very deep water levels exceeding 40 mbgl occur in 4.62% of the wells and 4.19% of the area, including Delhi Cantonment, Saket, Mehrauli, and Kalkaji (***Figure 3, Figure 4, and Figure 5 & Table-3)***

Table 3: Number of Wells monitored and Area Covered falling in different Depths to Water Level Ranges (January 2025)

Depth to water level range (mbgl)	Wells Monitored		Area Covered	
	No.	% age	Km2	% age
0 to 2 m	15	11.54 %	30.09	2.04 %
2 to 5 m	27	20.77 %	281.13	18.96 %
5 to 10 m	44	33.85 %	530.53	35.77 %
10 to 20 m	23	17.69 %	365.14	24.62 %
20 to 40 m	15	11.54 %	213.9	14.42 %
> 40 m	6	4.62 %	62.21	4.19 %
Total	**130**	**100**	**1483**	**100**

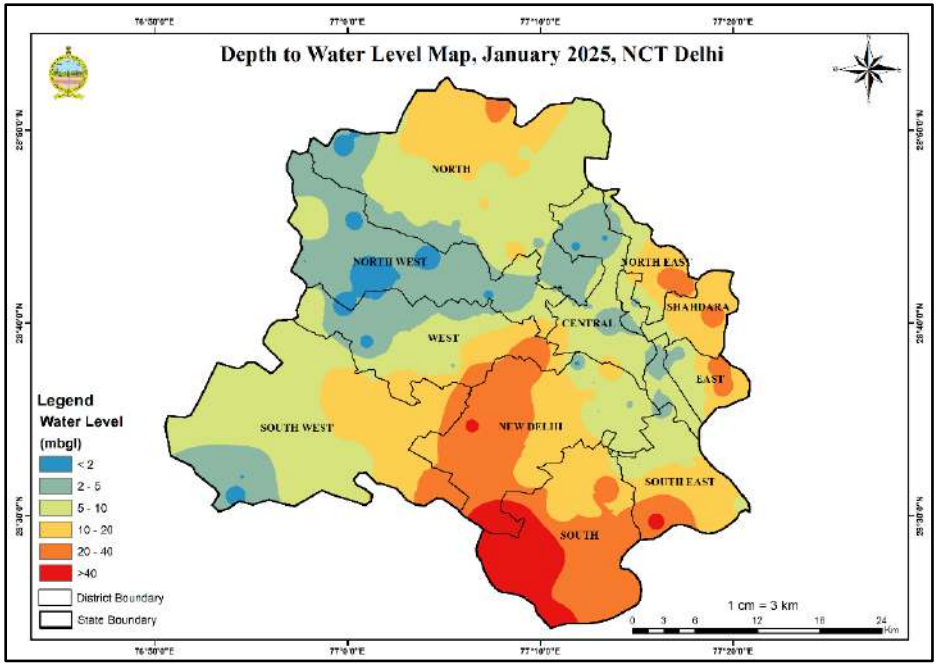

Figure 2: Depth to Water Level Map, January 2025, NCT Delhi

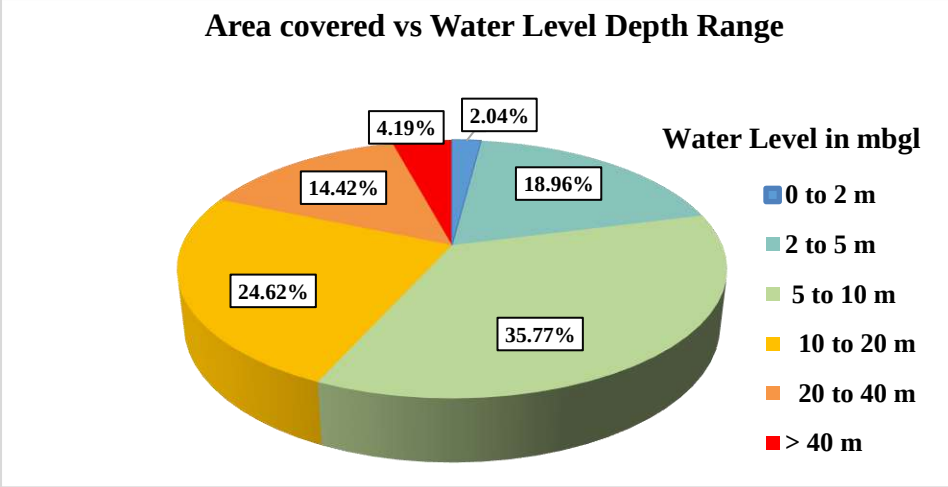

Figure 3: Area Covered Vs Water Level Depth Range (January 2025)

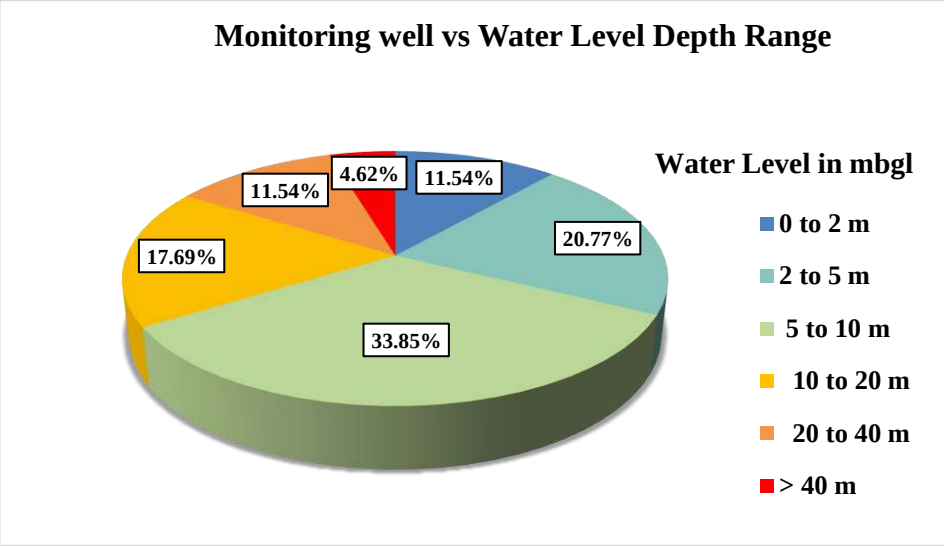

Figure 4 Monitoring Wells Vs Water Level Depth Range (January 2025)

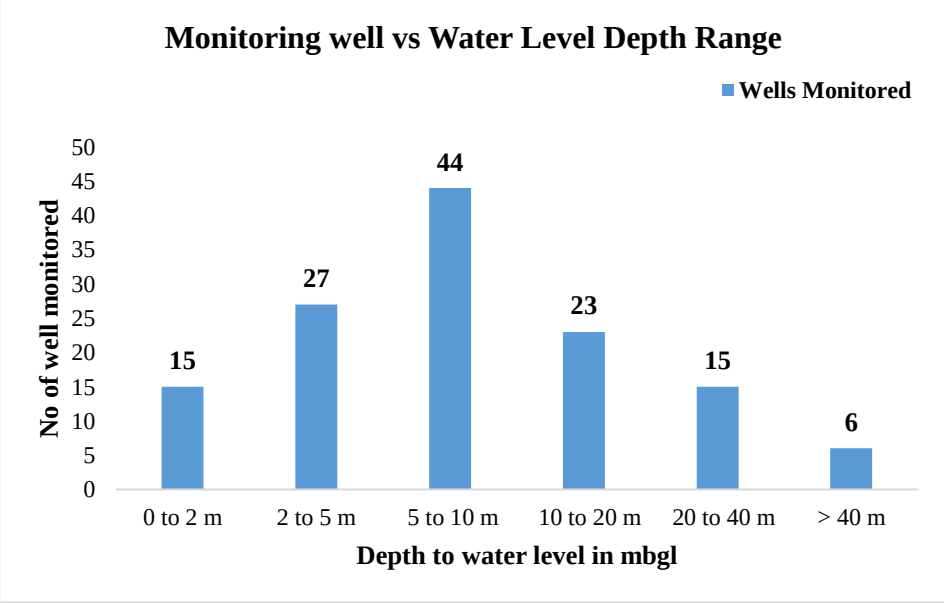

Figure 5: Monitoring Well Vs Water Level Depth Range (January 2025)

3.3.1 SEASONAL WATER LEVEL FLUCTUATIONS: (MAY 2024 – JANUARY 2025)

In January 2025, the ground water depth conditions across Delhi is, with the maximum concentration of wells falling within the 5 to 10 meters, range, with 33.85 % of the monitoring wells. Followed by 2 to 5 m and 10 to 20 m with 20.77% and 17.69 %. This suggests that the most prevalent groundwater levels are moderately deep. The water level 0 to 2 m is seen in 11.54% which shows a water logging and > 40 m is shown in 4.62% which indicate the extreme deep condition

The predominance of groundwater levels in the 2 to 5 mbgl, 5 to 10 mbgl and 10 to 20 mbgl ranges implies a state of moderate groundwater availability across much of Delhi. However, the decreasing number of wells in both shallower and deeper depth ranges suggests variability in groundwater conditions throughout the city.

Overall, this depth distribution points to a groundwater regime that is under moderate stress. The significant proportion of wells at moderate depths indicates that while groundwater is available, it was not uniformly accessible or abundant. The deeper groundwater levels suggest that the system might be experiencing pressure from high demand or insufficient recharge, contributing to an overall stressed groundwater condition in the region.

The comparative analysis of water level data from January 2025 with the previous measurements recorded in May 2024 elucidates the seasonal fluctuations in groundwater levels. This comparative evaluation, which captures the variability in groundwater levels across different times of the year, is critical for understanding the cyclical behavior of aquifer recharge and depletion (***Figure 6***). The analysis of seasonal fluctuations reveals a predominant decline in groundwater levels across 12.60 % of the monitored wells, encompassing 1.45 % of the state's area. Specifically, a decline is seen around 0 to 2 meter in range, predominantly in isolated patches across the Alipur, Model town, Dwarka, Kapashera, Vasant Vihar, Mehrauli, Vivek Vihar, Preet Vihar, Nazul Land and Mayur Vihar (***Figure 7, Figure 8 & Table 4***).

Conversely, water level increases are recorded in 87.40 % of the wells and 98.55 % of the area, with a rise of 0 - 2 meters noted in 58.27 % of wells and 71.56 % of the area, primarily in Alipur, Narela, Najafgarh, Kapashera, Dwarka, Patel Nagar, Rajouri Garden, Delhi Cantonment, Hauz Khas, Defence Colony, Punjabi Bagh, Saraswati Vihar, Model Town, Karawal Nagar, Seelampur, Seemapuri, Shahdara, Vivek Vihar, Preet Vihar, Mayur Vihar, Gandhi Nagar, and Sarita Vihar. Instances of water level rise exceeding 2 meters are observed, with 2 - 4 meters encompassing an area of 20.67% and occurring in 22.83 % of the total monitoring wells. These cover Narela, Khanjhawala, Rohini, Punjab Bagh, Karol Bagh, Chanakyapuri, Vasant Vihar, Mehrauli, Saket, Hauz Khas, Kalkaji and Yamuna Vihar. Greater than 4-meter ranges showing 6.30% occurrences in wells and 6.32% state area is seen in Rohini, Karol Bagh, Mehrauli and Saket of the state.

Table 4: Number of Wells monitored and areas covered falling in different Water Level Fluctuation Ranges (May 2024 & January 2025)

Water Level Fluctuation Range in meter		Wells Monitored		Area Covered	
		No.	% Age	Km2	% Age
Fall	0 to 2 m	16	12.60%	21.52	1.45%
	2 to 4 m	0	0.00%	0	0.00%
	>4 m	0	0.00%	0	0.00%
Rise	0 to 2 m	74	58.27%	1061.24	71.56%
	2 to 4 m	29	22.83%	306.51	20.67%
	>4 m	8	6.30%	93.73	6.32%
Total		**127**	**100.00%**	**1483**	**100.00%**

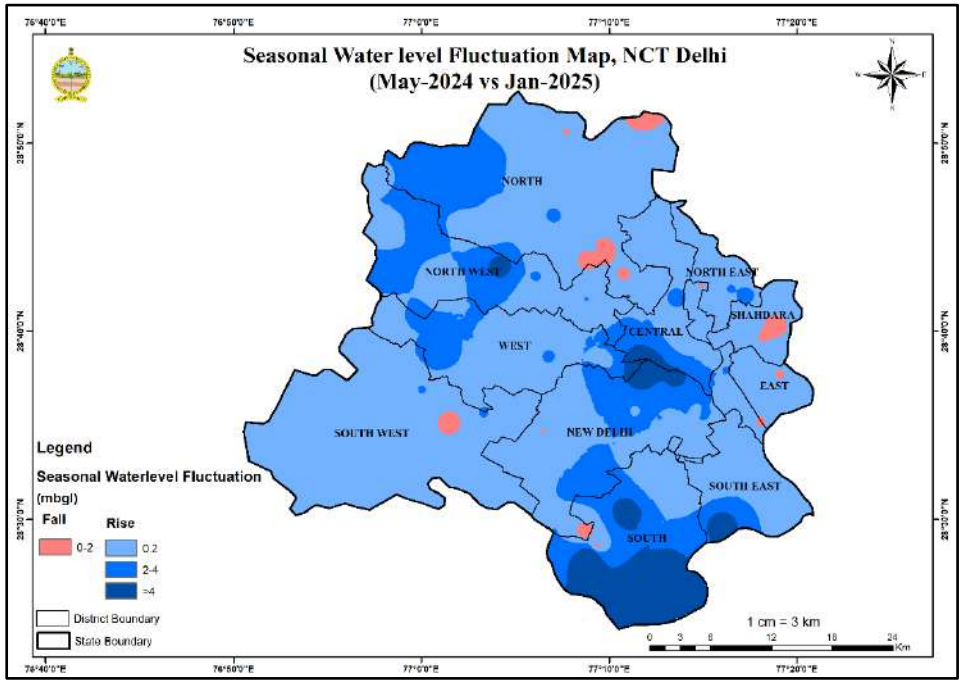

Figure 6: Water Level Fluctuation Map of NCT of Delhi (May 2024 & January 2025)

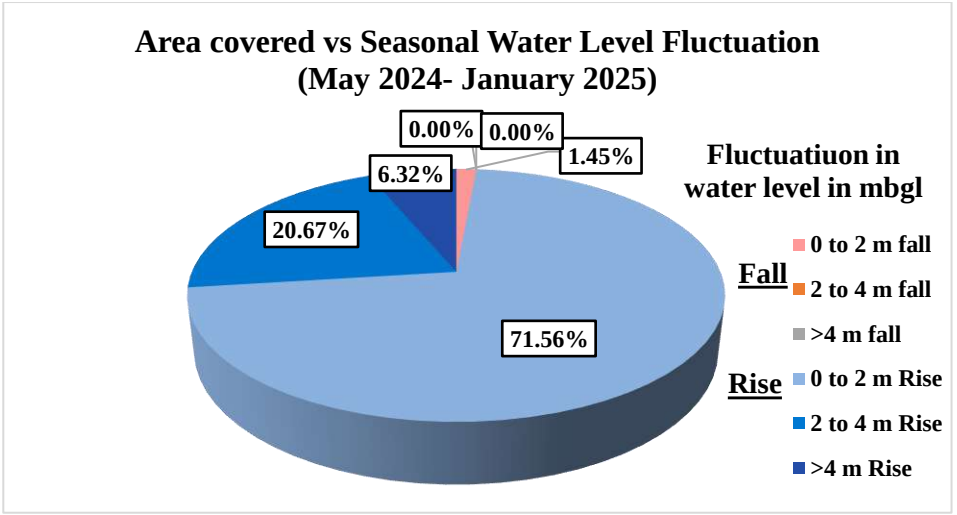

Figure 7: Fluctuations in Water Level by Area (May 2024 & January 2025)

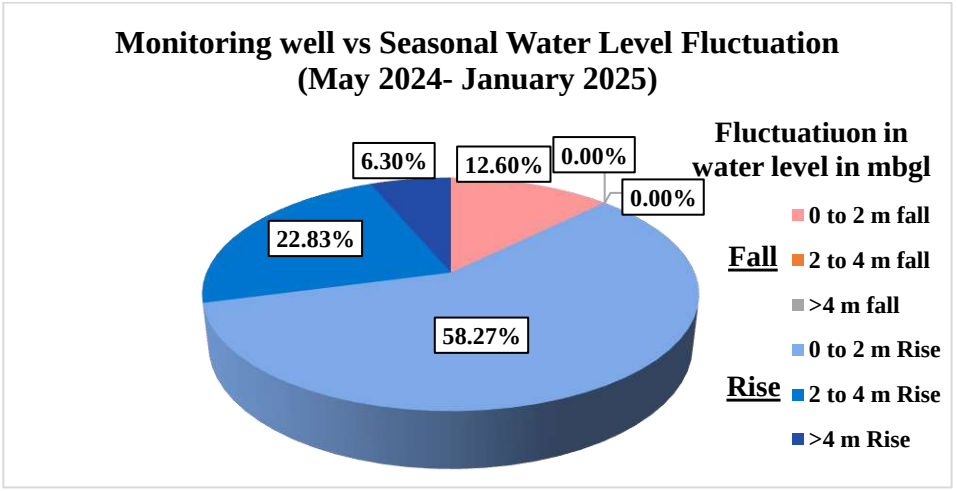

Figure 8: Fluctuation in Water Level (May 2024 & January 2025)

The seasonal water level fluctuation, i.e. the change in the depth to water level of January 2025 with respect to May 2024 reveals the effective rise of groundwater levels owing to the monsoonal season. A number of wells

showing the change in groundwater level in the region over a period from May to January is presented below (***Figure 9***).

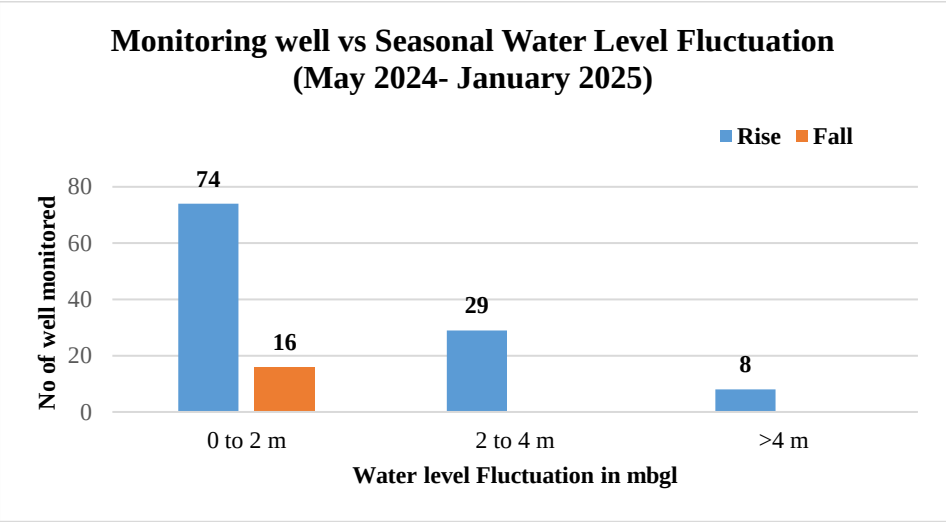

Figure 9: Fluctuation in Water Level: May 2024 - January 2025

3.3.2 SEASONAL WATER LEVEL FLUCTUATIONS: (AUGUST 2024 – JANUARY 2025)

The comparative analysis of water level data from January 2025 with the previous measurements recorded in August 2024 elucidates the seasonal fluctuations in groundwater levels. This comparative evaluation, which captures the variability in groundwater levels across different times of the year, is critical for understanding the cyclical behavior of aquifer recharge and depletion (***Figure 10***). The analysis of seasonal fluctuations reveals a predominant decline in groundwater levels across 37.81 % of the monitored wells, encompassing 28.60 % of the state's area. Specifically, a decline is seen around 0 to 2 meter in range, is seen in 32.77% of monitoring well and 24.16 % of state area predominantly in South west, South and North West regions, including Saket, Mehrauli, Kapashera, Najafgarh, Rohini, Khanjhwala, Saraswati Vihar, Model Town, Civil lines, Vasant Vihar and Saritha Vihar. The water level of 2 to 4 meter is seen in 2.52% of monitoring well and 2.35 % of State area in patches of Dwarka, Saket, Mehrauli, and Punjab Bagh. Water level >4 m is seen in 2.52% of well with an area of 2.35% in patches of Saket, Mehrauli, and Punjab Bagh. (***Figure 11, Figure 12 & Table 5***).

Conversely, water level increases are recorded in 62.19 % of the wells and 71.40 % of the area, with a rise of 0 - 2 meters noted in 32.77 % of wells and 24.16% of the area, primarily in Narela, Alipur, Chanakyapuri, Khanjhawala, Najafgarh, Kapashera, Dwarka, Patel Nagar, Punjab Bagh, Delhi Cantonment, Hauz Khas, Defenses Colony, Kalka ji, Karwal Nagar, Yamuna Vihar, Vivek Vihar, Preet Vihar, Mayur Vihar and Saritha Vihar. Instances of water level rise exceeding 2 meters are observed, with 2 - 4 meters encompassing an area of 3.50% and occurring in 9.25 % of the total monitoring wells. These cover Patel Nagar, Alipur, Rajouri Garden, Karol Bagh, Gandhi Nagar, Model Town and Kalkaji. Greater than 4-meter ranges showing 3.36% occurrences in wells and 0.47% state area is seen in Rajouri Garden, Patel Nager, and Model town of the state

Table 5: Number of Wells monitored and areas covered falling in different Water Level Fluctuation Ranges (August 2024 & January 2025)

Water Level Fluctuation Range in meter		Wells Monitored		Area Covered	
		No.	% Age	Km2	% Age
Fall	0 to 2 m	39	32.77%	358.11	24.16%
	2 to 4 m	3	2.52%	34.85	2.35%
	>4 m	3	2.52%	31.03	2.09%
Rise	0 to 2 m	59	49.58%	1000.01	67.43%
	2 to 4 m	11	9.25%	51.97	3.50%
	>4 m	4	3.36%	7.03	0.47%
Total		**119**	**100.00%**	**1483**	**100.00%**

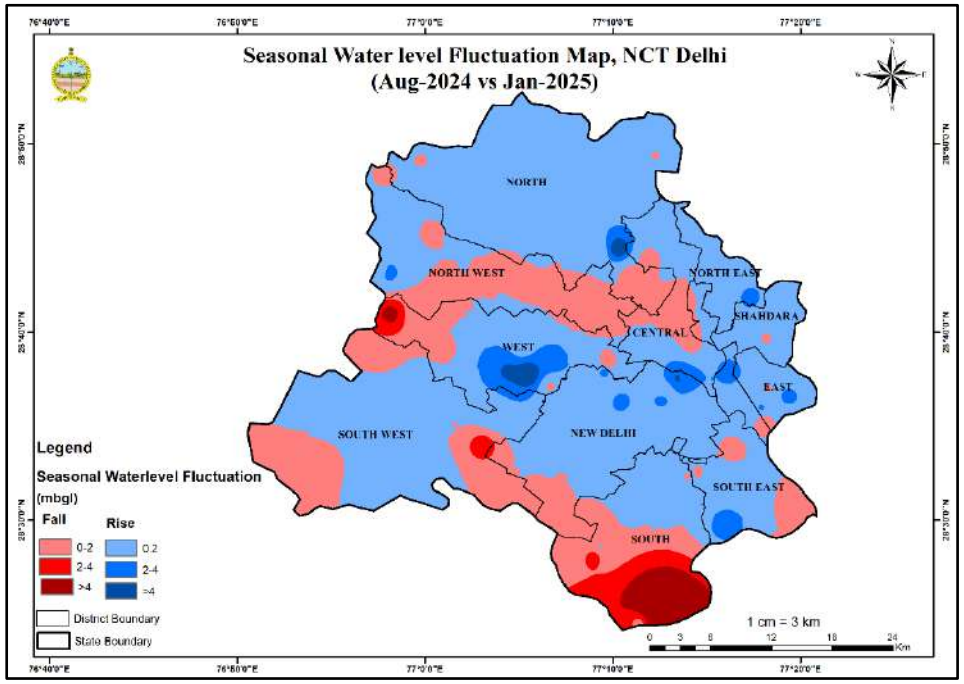

Figure 10: Water Level Fluctuation Map of NCT of Delhi (August 2024 & January 2025

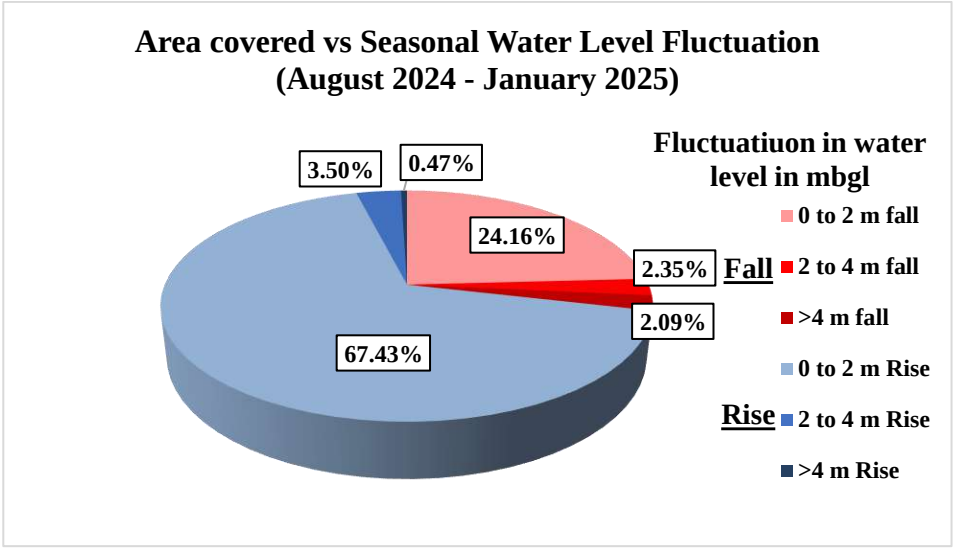

Figure 11: Fluctuations in Water Level by Area (August 2024 & January 2025)

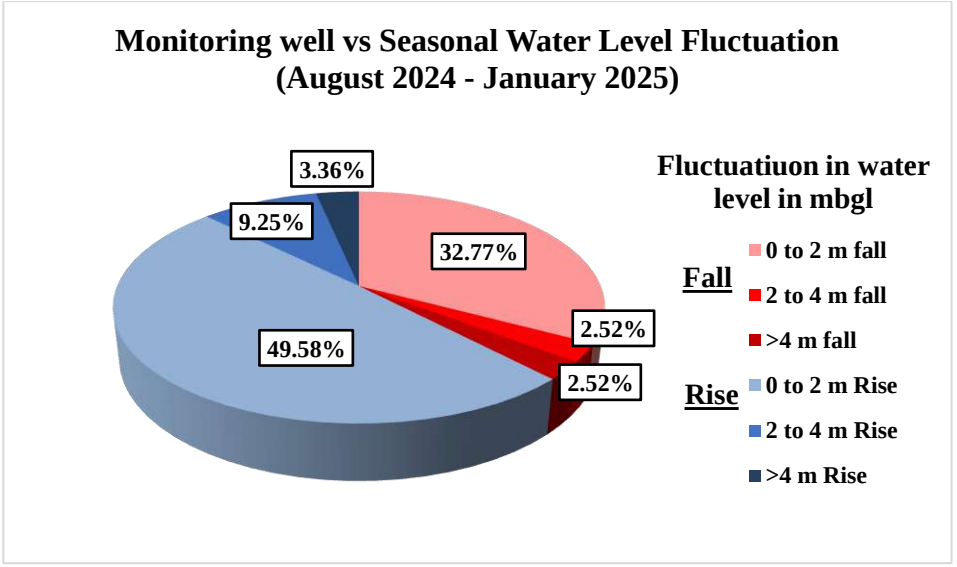

Figure 12: Fluctuation in Water Level (August 2024 & January 2025)

The seasonal water level fluctuation, i.e. the change in the depth to water level of January 2025 with respect to August 2024 reveals the effective rise of groundwater levels owing to the monsoonal season. A number of wells showing the change in groundwater level in the region over a period from August to January is presented below (***Figure 13***).

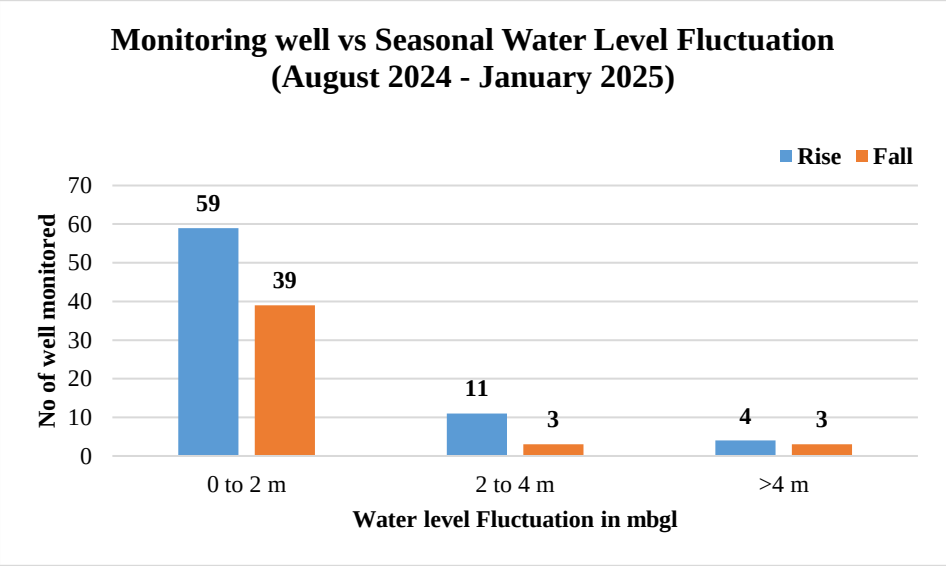

Figure 13: Fluctuation in Water Level: August 2024 - January 2025

3.3.3 SEASONAL WATER LEVEL FLUCTUATIONS: (NOVEMBER 2024 – JANUARY 2025)

The comparative analysis of water level data from January 2025 with the previous measurements recorded in November 2024 elucidates the seasonal fluctuations in groundwater levels. This comparative evaluation, which captures the variability in groundwater levels across different times of the year, is critical for understanding the cyclical behavior of aquifer recharge and depletion (***Figure 14***). The analysis of seasonal fluctuations reveals a predominant decline in groundwater levels across 38.28 % of the monitored wells, encompassing 31.04 % of the state's area. Specifically, a decline is seen around 0 to 2 meter in range, predominantly in isolated patches across the South west, North, South, South East regions, including Najafgarh, Punjabi Bagh, Vasant Vihar, Sarita Vihar, Defence Colony, Dwarka, Mehrauli, Saket, Kalkaji, , Alipur, and Kaspashera. Water level >4 m is seen in 1.56% of well with an area of 0.95% (***Figure 15, Figure 16 & Table 6***).

Conversely, water level increases are recorded in 61.72 % of the wells and 68.96 % of the area, with a rise of 0 - 2 meters noted in 59.38 % of wells and 67.87 % of the area, primarily in Narela, Alipur, Chanakyapuri, Civil Lines, Delhi Cantonment, Dwarka, Hauz Khas, Kanjhawala, Kapashera, Kotwali, Mayur Vihar, Mehrauli, Najafgarh, Nazul land, Preet Vihar, Punjab Bagh, Rohini, Saraswati Vihar, Vasant Vihar and Yamuna Vihar. Instances of water level rise exceeding 2 meters are observed, with 2 - 4 meters encompassing an area of 0.78% and occurring in 0.77 % of the total monitoring wells. These cover Mehrauli, Saket, Narela, Chanakyapuri and Kotwali. Greater than 4-meter ranges showing 1.56% occurrences in wells and 0.32% state area is seen in Mehrauli and Saket of the state.

Table 6: Number of Wells monitored and areas covered falling in different Water Level Fluctuation Ranges (November 2024 & January 2025)

Water Level Fluctuation Range in meters		Wells Monitored		Area Covered	
		No.	% age	Km2	% age
Decline	0 to 2	47	36.72 %	446.26	30.09 %
	2 to 4	0	0.00 %	0	0.00 %
	>4	2	1.56 %	14.13	0.95 %
Rise	0 to 2	76	59.38 %	1006.48	67.87 %
	2 to 4	1	0.78 %	11.38	0.77 %
	> 4	2	1.56 %	4.75	0.32 %
Total		**128**	**100**	**1483**	**100**

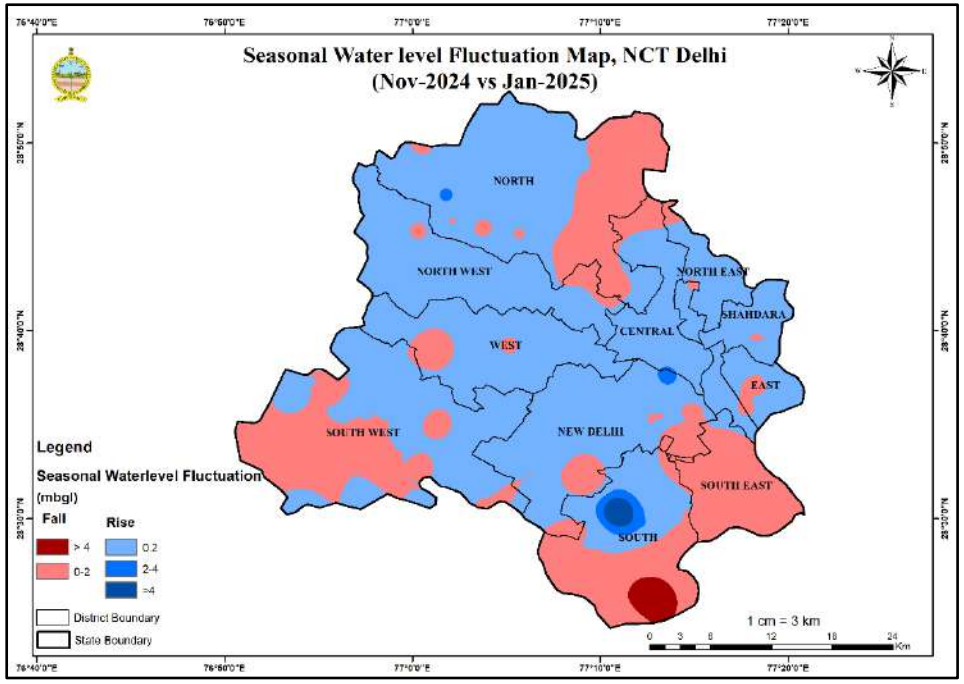

Figure 14: Water Level Fluctuation Map of NCT of Delhi (November 2024 & January 2025)

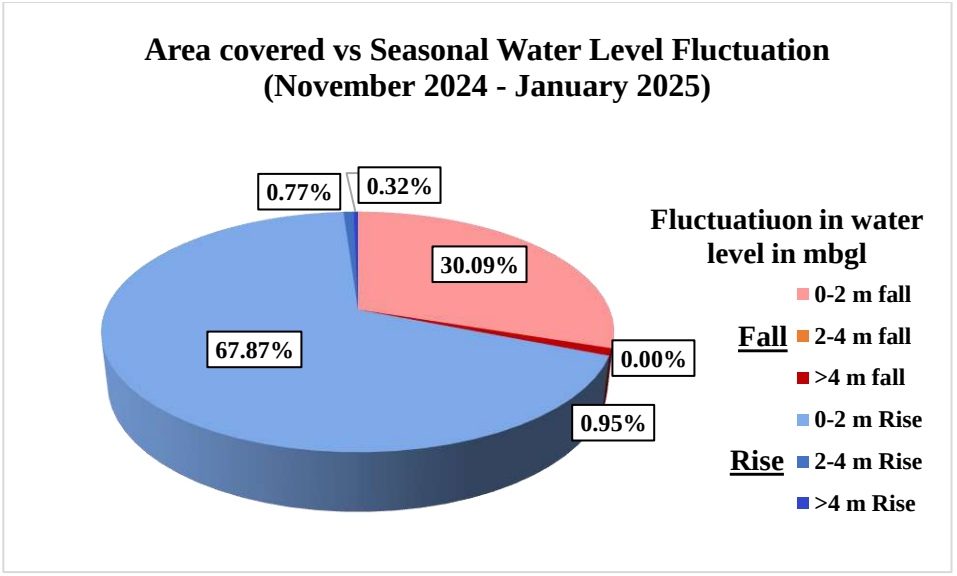

Figure 15: Fluctuations in Water Level by Area (November 2024 & January 2025)

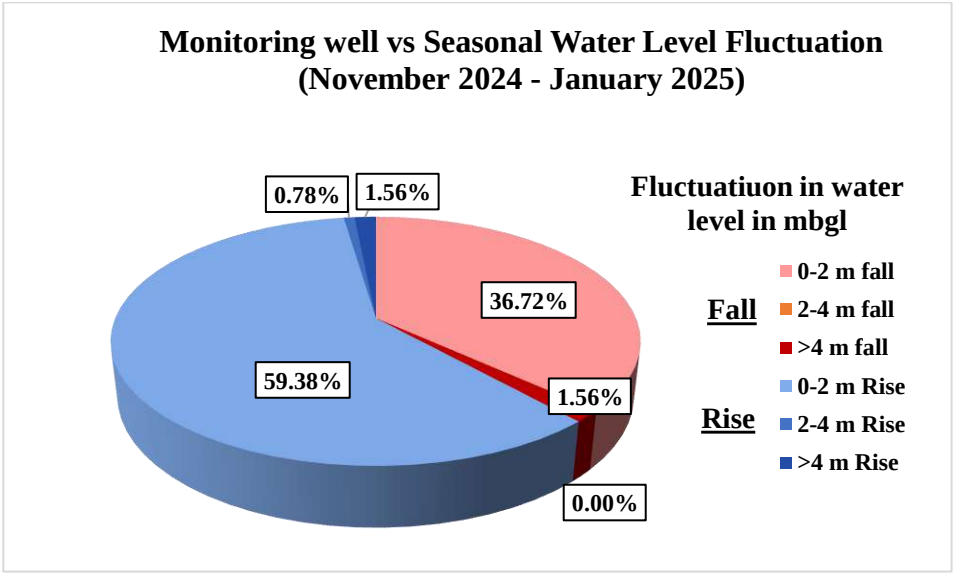

Figure 16: Fluctuation in Water Level (November 2024 & January 2025)

The seasonal water level fluctuation, i.e. the change in the depth to water level of January 2025 with respect to November 2024 reveals the effective rise of groundwater levels owing to the monsoonal season. A number of wells showing the change in groundwater level in the region over a period from November to January is presented below (***Figure 17***).

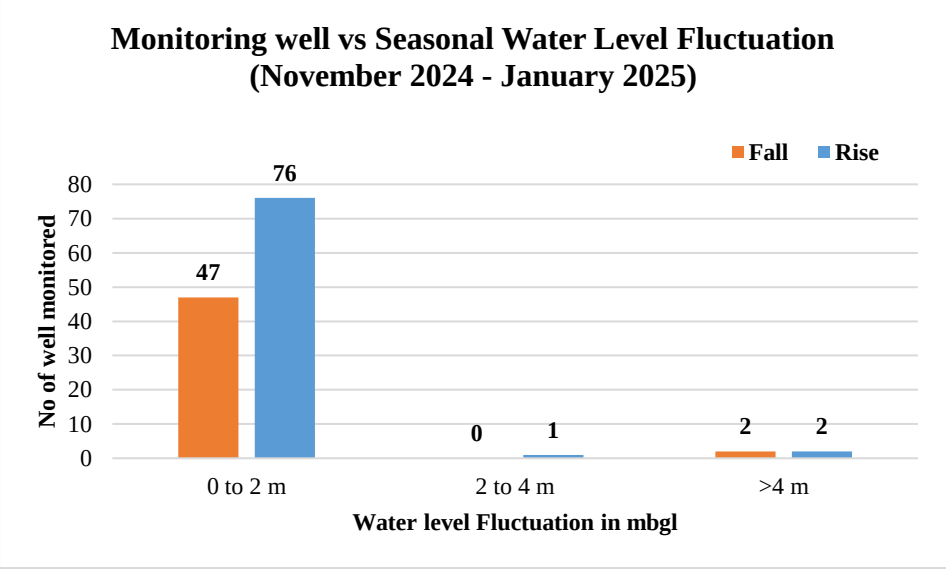

Figure 17: Fluctuation in Water Level: November 2024 - January 2025

The data indicates a predominantly water-logged groundwater system with a general rise in water levels across both shallow and moderate depths. The minimal decline observed in a small percentage of wells suggests overall improvement.

3.4.1 ANNUAL FLUCTUATIONS: (JANUARY 2023 - JANUARY 2025)

To assess the effects of rainfall and groundwater extraction over the past year, we computed annual water level fluctuations between January 2023 and January 2025. The resulting behavior is detailed below and illustrated in (***Figure 18).***

The interpretation of the data reveals that water levels declined in approximately 36.52% of monitored wells, encompassing 22.85% of the state's total area. Specifically, a decline of 0-2 meters was noted in 30.43 % of wells, affecting 22.34 % of the area, encompassing the tehsil of Alipur, Narela, Nazul Land, Seelampur, Civil Lines, Nazul Land, Vivek Vihar, Mayur Vihar, Defence Colony, Sarita Vihar. Mehrauli, and small patch of Dwarka, Kapashera, Rajouri Garden. While a 2-4 meter drop was observed only in 6.09% of wells and 0.51% of the area. More significant declines, exceeding 4 meters are not recorded in any patches of the state; this indicates there is no excessive stress on the aquifer system.

Conversely, water levels rose in 63.48% of the wells, covering 77.15% of the area. A rise of 0-2 meters was most prevalent, detected in 46.96% of wells and 65.31 % of the state area, encompassing the tehsil of Narela, Khanjhawala, Rohini, Punjab Bagh, Najafgarh, Kapashera, Dwarka, Delhi Cantonment, Saraswati Vihar, Model Town, Karawal Nagar, Vasant Vihar, Saket, Kalkaji and Defence Colony. Notably, a 2-4 meter rise occurred in 11.30 % of wells and 11.10 % area occurring in patches in Chanakyapuri, Delhi Cantonment, Saket, Kapashera, Khanjhawala, Hauz Khas and Dwarka. Water levels over 4 meters of rise are observed in 5.22 % of wells and 0.74% of the surveyed region seen as patches in Saket, Karol Bagh, Delhi Cantonment and Chanakyapuri (***Figure 19 & Figure 20 & Table 7***).

Table 7: Number of Wells monitored and areas covered falling in different Water Level Fluctuation Ranges (January 2023 & January 2025)

Water Level Fluctuation Range in meter		Wells Monitored		Area Covered	
		No.	% age	Km2	% Age
Fall	0 to 2 m	35	30.43%	331.25	22.34%
	2 to 4 m	7	6.09%	7.61	0.51%
	>4 m	0	0.00%	0	0.00%
Rise	0 to 2 m Rise	54	46.96%	968.54	65.31%
	2 to 4 m Rise	13	11.30%	164.59	11.10%
	>4 m Rise	6	5.22%	11.01	0.74%
Total		**115**	**100.00%**	**1483**	**100.00%**

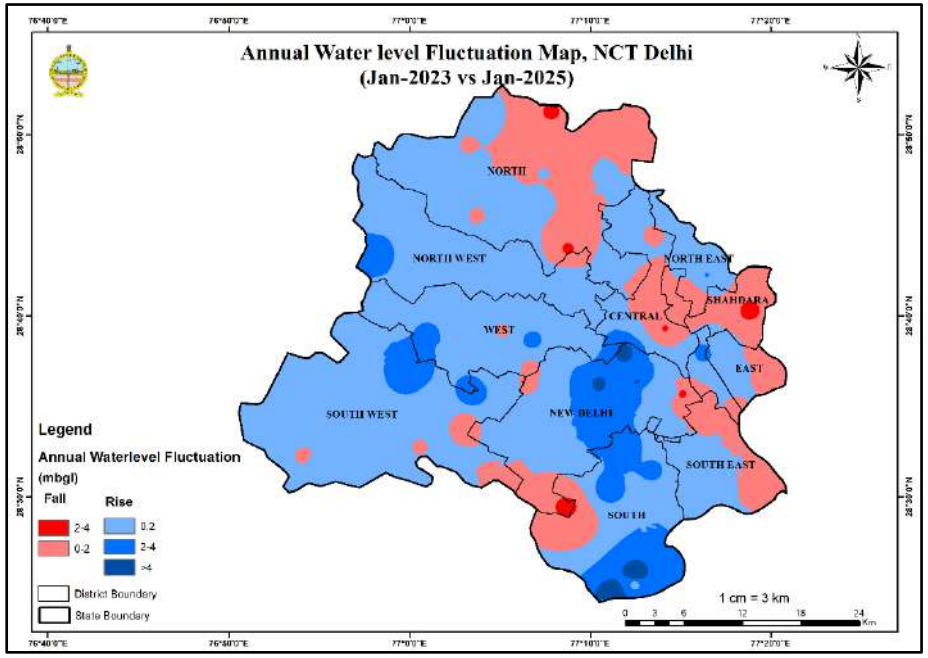

Figure 18: Depth to Water Level Fluctuation Map of NCT of Delhi (January 2024 & January 2025)

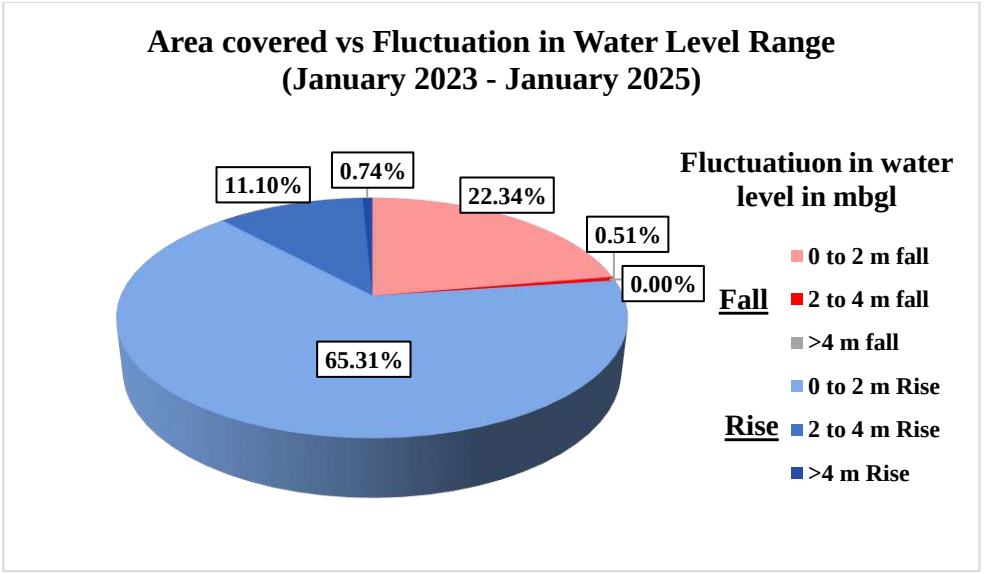

Figure 19: Fluctuation in Water Level by Area (January 2023 Vs January 2025)

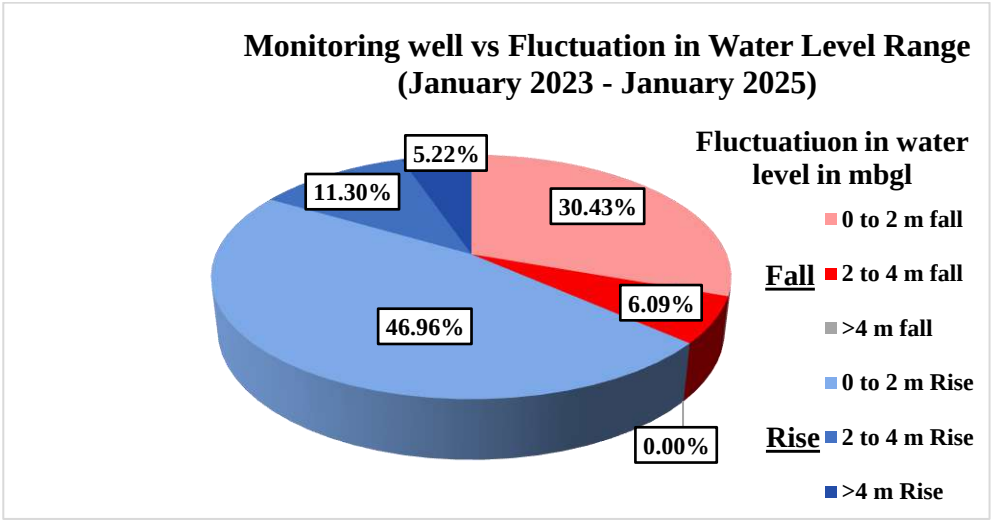

Figure 20: Fluctuation in Water Level: January 2023 Vs January 2025

The Post monsoon groundwater regime monitoring highlights significant annual fluctuations across the monitored wells. Notably, a rise in groundwater levels in 0-2 meters range was recorded in 54 no of wells, suggesting zones of positive recharge trends. Moderate increases, with 13 no of wells experiencing water level rises in the 2-4 meters and 6 wells of > 4 meter indicating areas of effective recharge during the observation period.

Conversely, groundwater level declines present a concerning scenario where, in spite of a substantial rise in the water level during the recharge period, the decline percentage remains 42 wells Each of these observations can be spotted in the following graph (***Figure 21***).

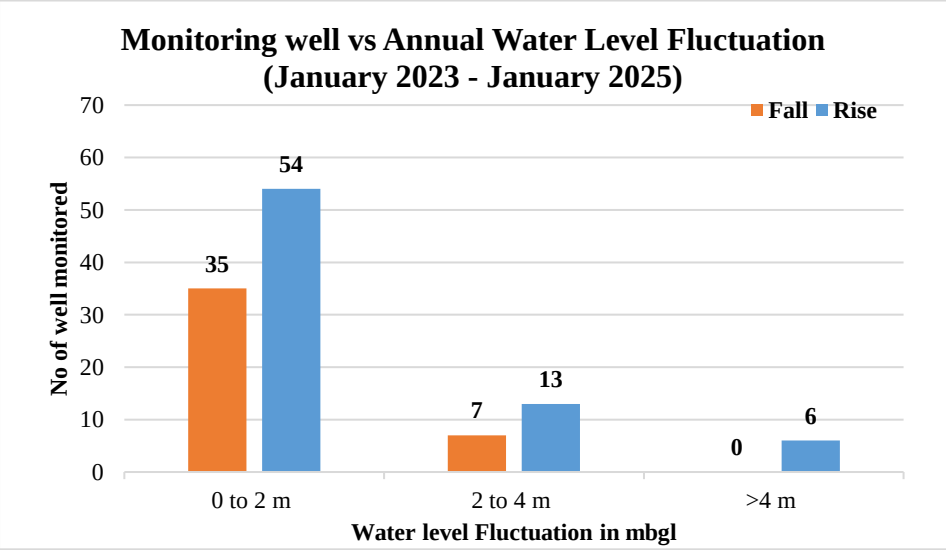

Figure 21: Fluctuation in Water Level: January 2023- January 2025

3.4.2 ANNUAL FLUCTUATIONS: (JANUARY 2024 - JANUARY 2025)

To assess the effects of rainfall and groundwater extraction over the past year, we computed annual water level fluctuations between January 2024 and January 2025. The resulting behavior is detailed below and illustrated in (***Figure 22)***.

The interpretation of the data reveals that water levels declined in approximately 27.35% of monitored wells, encompassing 12.33% of the state's total area. Specifically, a decline of 0-2 meters was noted in 26.50 % of wells, affecting 12.27 % of the area, encompassing the tehsil of Alipur, Narela, Nazul Land, Seelampur, Civil Lines, Vivek Vihar, Seemapuri, Karwal Nagar, Shahdara, Mayur Vihar, Sarita Vihar, Punjab Bagh and small patches of Vasant Vihar, Delhi Cantonment, Kapashera, Rajouri Garden, Saraswati Vihar and Dwarka. While a 2-4 meter drop was observed only in 0.85% of wells and 0.06% of the area. More significant declines, exceeding 4 meters are not recorded in any patches of the state; this indicates there is no excessive stress on the aquifer system.

Conversely, water levels rose in 72.65% of the wells, covering 87.67% of the area. A rise of 0-2 meters was most prevalent, detected in 57.26% of wells and 76.24 % of the state area, encompassing the tehsil of Narela, Kanjhawala, Rohini, Punjabi Bagh, Kalkaji, Alipur, Chanakyapuri, Civil Lines, Delhi Cantonment, Dwarka, Hauz Khas, Kapashera, Dwarka, Kotwali, Mehrauli, Model Town, Najafgarh, Nazulland, Patel Nagar, Saraswati Vihar, Delhi Cantonment, Vasant Vihar, Defence Colony, Mayur Vihar, Preet Vihar and Yamuna Vihar. Notably, a 2-4 meter rise occurred in 9.40 % of wells and 8.39 % area occurring in patches in Chanakyapuri, Yamuna Vihar, Mehrauli, Delhi Cantonment, Dwarka, Punjab Bagh, Saket and small patch of Khanjawala, Dwarka and Saraswati

Vihar. Water levels over 4 meters of rise are observed in 5.99 % of wells and 3.04% of the surveyed region (***Figure 23 & Figure 24 & Table 8***).

Table 8: Number of Wells monitored and areas covered falling in different Water Level Fluctuation Ranges (January 2024 & January 2025)

Water Level Fluctuation Range in meter		Wells Monitored		Area Covered	
		No.	% Age	Km2	% Age
Decline	0 to 2 m	31	26.50 %	182.01	12.27 %
	2 to 4 m	1	0.85 %	0.88	0.06 %
	>4 m	0	0.00 %	0	0.00 %
Rise	0 to 2 m	67	57.26 %	1130.68	76.24 %
	2 to 4 m	11	9.40 %	124.36	8.39 %
	>4 m	7	5.99 %	45.07	3.04 %
Total		**117**	**100**	**1483**	**100**

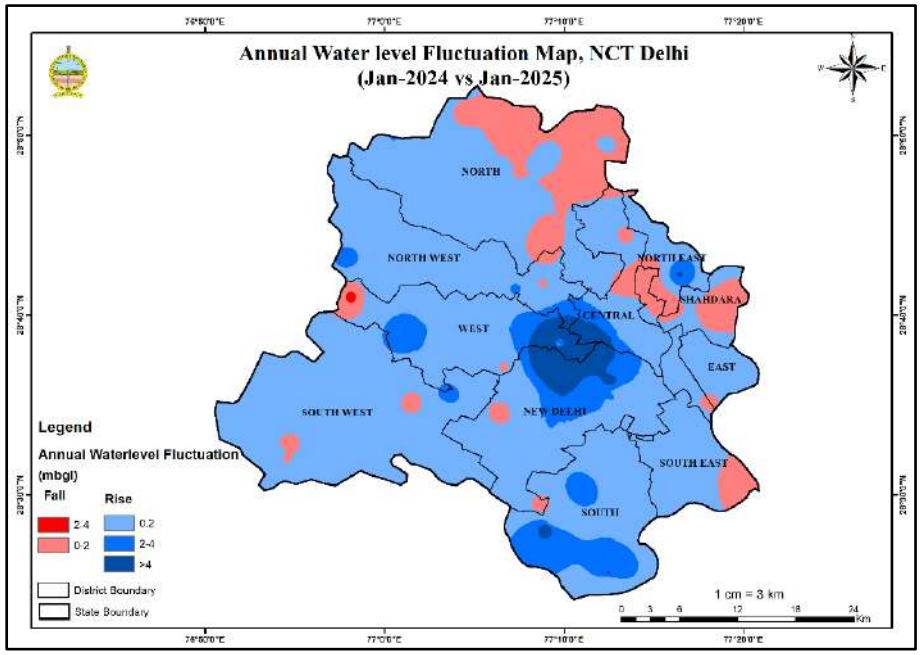

Figure 22: Depth to Water Level Fluctuation Map of NCT of Delhi (January 2024 & January 2025)

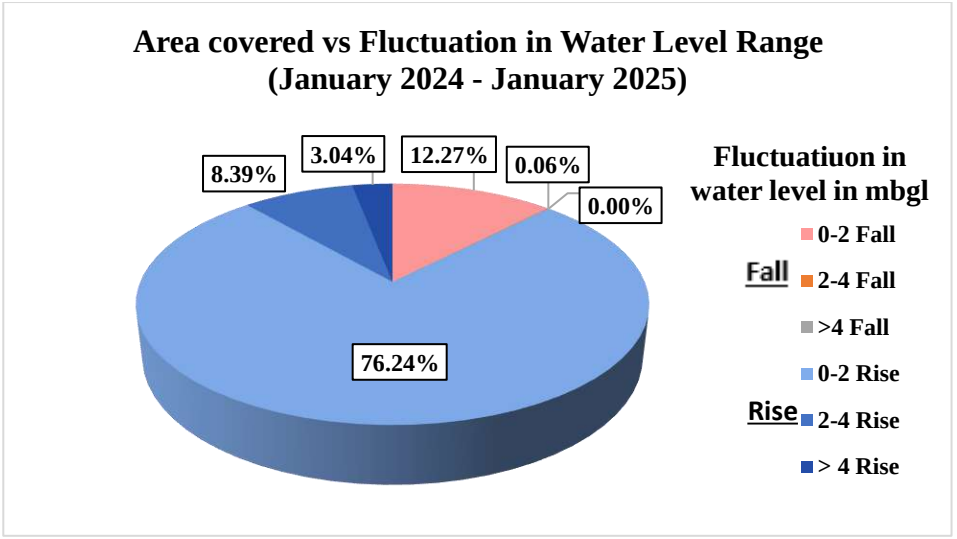

Figure 23: Fluctuation in Water Level by Area (January 2024 Vs January 2025)

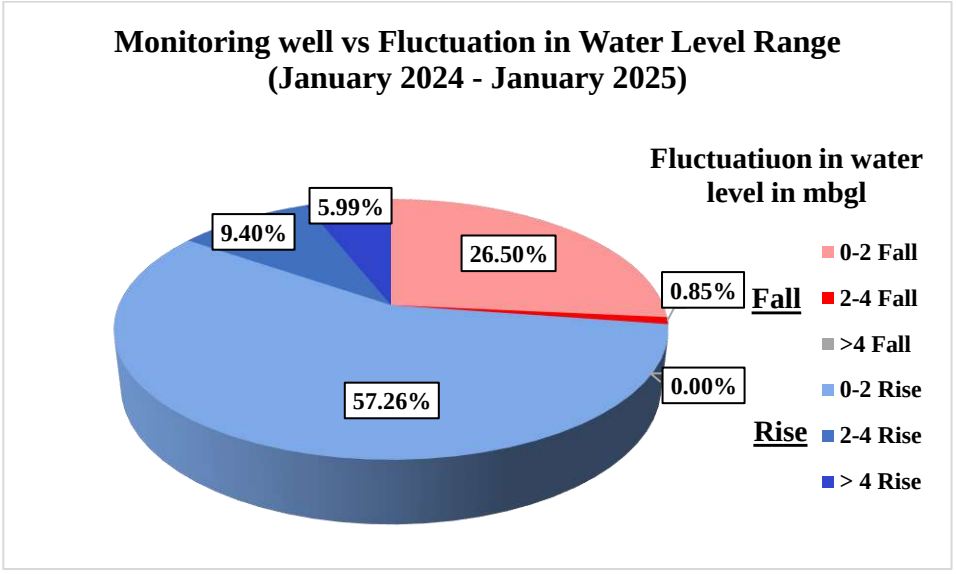

Figure 24: Fluctuation in Water Level: January 2024 Vs January 2025

The Post monsoon groundwater regime monitoring highlights significant annual fluctuations across the monitored wells. Notably, a rise

in groundwater levels in 0-2 meters range was recorded in 67 no of wells, suggesting zones of positive recharge trends. Moderate increases, with 11 no of wells experiencing water level rises in the 2-4 meters and 7 wells of > 4 meter indicating areas of effective recharge during the observation period.

Conversely, groundwater level declines present a concerning scenario where, in spite of a substantial rise in the water level during the recharge period, the decline percentage remains 32 wells Each of these observations can be spotted in the following graph (***Figure 25***).

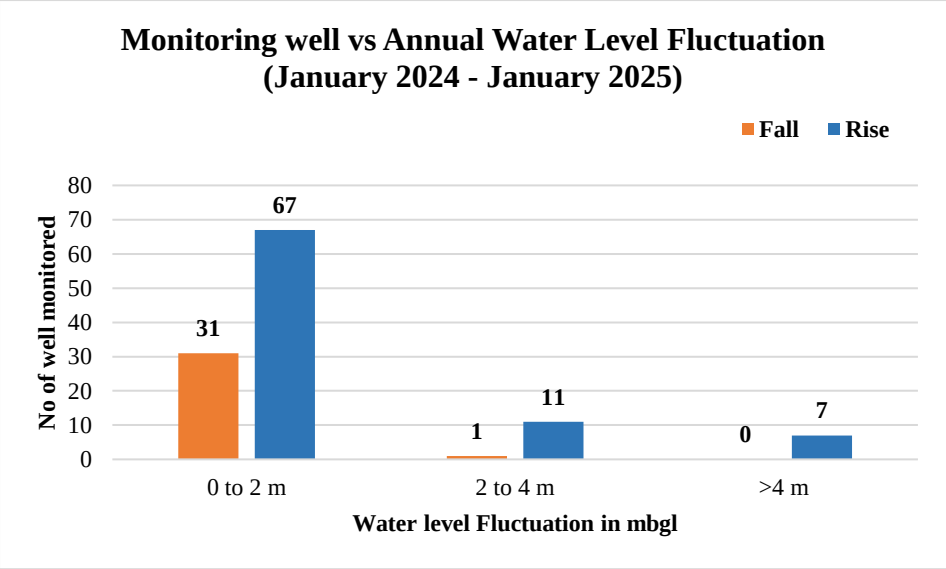

Figure 25: Fluctuation in Water Level: January 2024- January 2025

3.5 DECADAL MEAN FLUCTUATIONS JANUARY (2015-2024) & JANUARY 2025

The changes in groundwater level behavior over the last decade have been assessed using decadal mean data. For each groundwater observation well, the mean water level for the period 2015-2024 was computed and compared with the corresponding water level data from January 2025. The observed trends over this period are detailed below, with accompanying (***Figure 26)***.

The interpretation of decadal mean fluctuations reveals that 24.30 % of the wells exhibit a water level decline, impacting approximately 17% of the state's total area. A decline in the 0 - 2 meter range is noted in 15.89% of the wells, affecting 13.09% of the state in Alipur, Narela, Model Town, Saraswati Vihar, Karawal Nagar, Seelampur, Shahdara, Vivek Vihar, Preeti Vihar, Mayur Vihar, Sarita Vihar, Saket, Mehrauli, Vasant Vihar and some patches in Delhi Cantonment, Patel Nagar, Chanakyapuri and Kalkaji, Additionally, a decline between 2-4 meters has been reported in 4.67% of wells, encompassing 3.43% of the state's area in Karawal Nagar, Seelampur, Seemapuri, Mayur Vihar, Vivek Vihar, Saket, Mehrauli, and Vasant Vihar while more severe declines of over 4 meters were observed in 3.74% of wells and 0.48% of the area, seen in Yamuna Vihar, Karawal Nagar, Seelampur, Saket, Vasant Vihar (***Figure 27 &Figure 28 & Table 9***).

Conversely, a water level rise has been recorded in 75.70% of wells, covering 83.01% of the state's area. A small yet significant rise in the 0-2 meter range was observed in 41.12% of wells, spanning 39.13% of the state's area, seen in the form of patches in the Alipur, Narela, Kanjhawala, Rohini, Punjab Bagh, Saraswati Vihar, Delhi Cantonment, Vasant Vihar, Defence Colony, Kotwali, Preet Vihar, Nazul Land and Civil Lines. Rises of 2-4 meters were noted in 12.15% of wells, covering

23.98% of the state in Khanjhwala, Najafgarh, Kapashera, Punjab Bagh, Dwarka, Mehrauli, Vasant Vihar, Delhi Cantonment, Civil Line, Chanakyapuri, Defence colony and Kalkaji. While more substantial rises of over 4 meters were recorded in 22.43% of wells, affecting 19.90% of the area in Patel Nagar, Dwarka, Najafgarh, Hauz Khas, Saket, Chanakyapuri, and some part of Mehrauli, Karol Bagh, Kalkaji. These fluctuations provide a detailed view of the state's groundwater regime, reflecting both areas of depletion and zones of recharge. The above information has been depicted in statistical format in the graphs following (***Figure 29).***

Table 9: Number of Wells monitored and areas covered falling in different Water Level Fluctuation Ranges (January (2015-'24) & January 2025)

Water Level Fluctuation Range in meter		Wells Monitored		Area Covered	
		No.	% Age	Km2	% Age
Decline	0 to 2 m	17	15.89%	194.08	13.09%
	2 to 4 m	5	4.67%	50.92	3.43%
	>4 m	4	3.74%	7.08	0.48%
Rise	0 to 2 m	44	41.12%	580.23	39.13%
	2 to 4 m	13	12.15%	355.57	23.98%
	>4 m	24	22.43%	295.12	19.90%
Total		**107**	**100.00%**	**1483**	**100.00%**

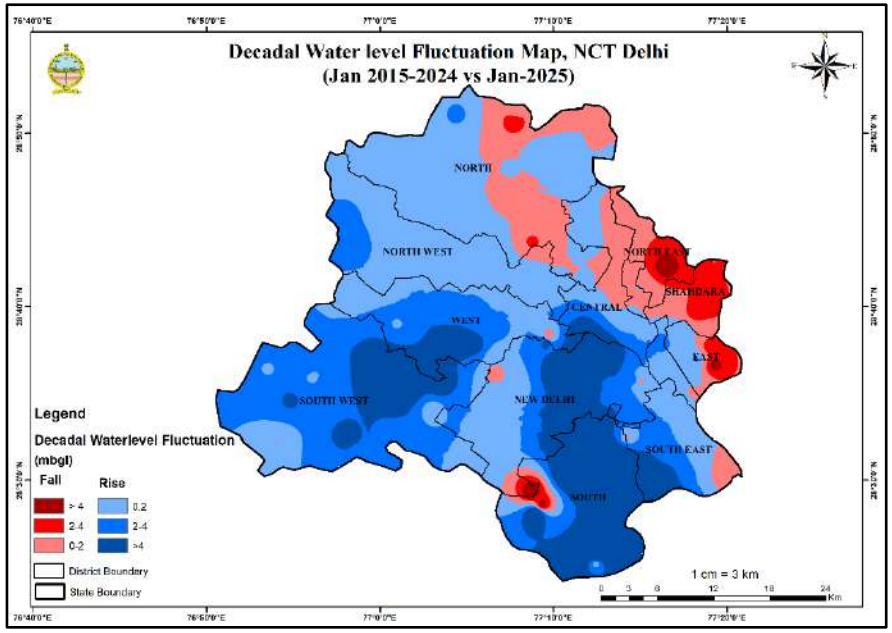

Figure 26: Water Level Fluctuation Map of NCT of Delhi Decadal Mean January (2015-2024) & January 2025

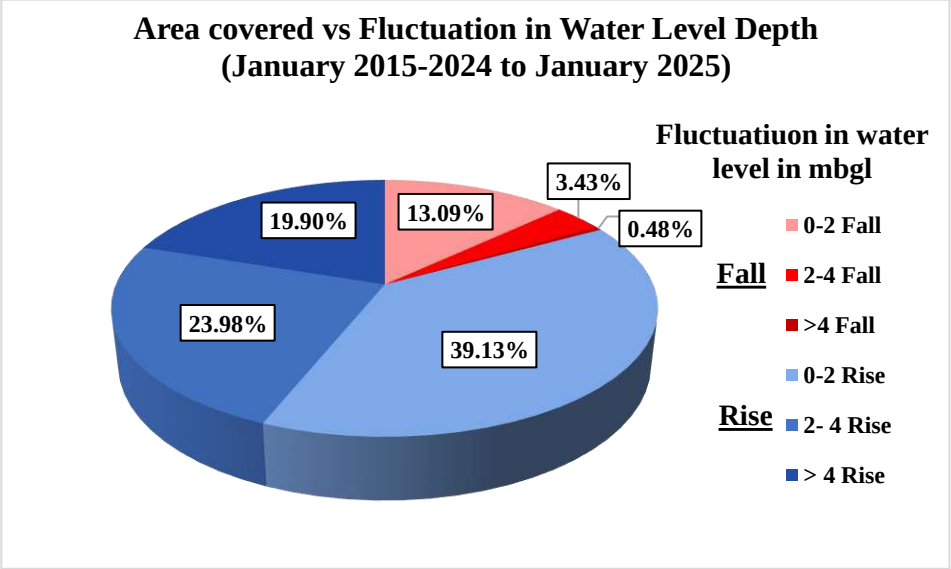

Figure 27: Fluctuation in Water Level by Area (January 2015-2024) Vs January 2025

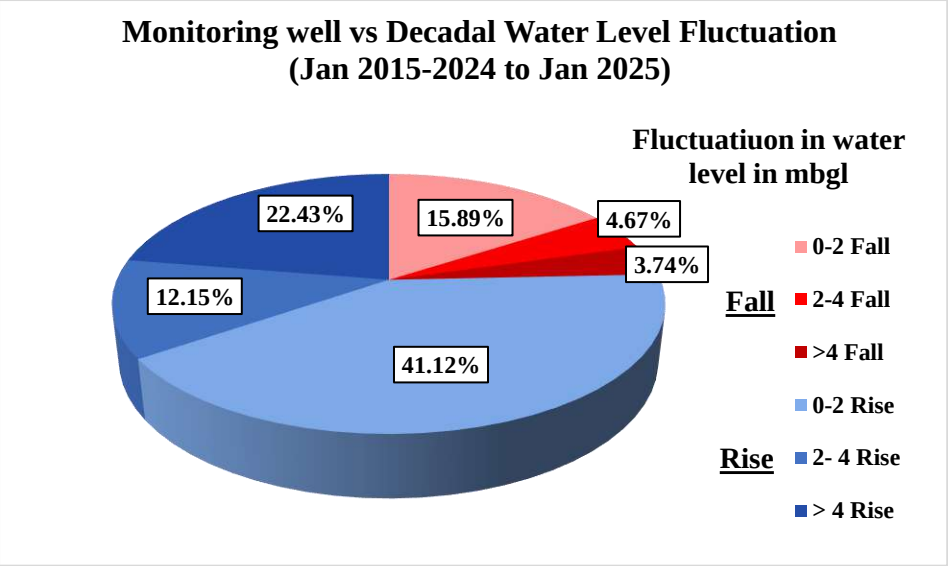

Figure 28: Fluctuation in Water Level: January (2015-2024) - January 2025

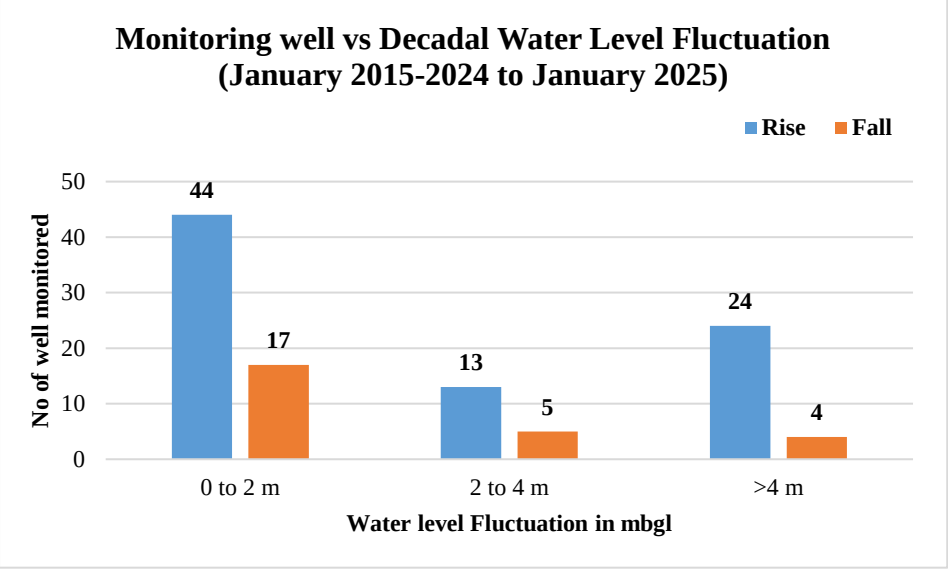

Figure 29: Fluctuations in Water Level: January (2015-2024) - January 2025

4. CONCLUSIONS

The interpretation results of the January 2025 water levels shows that New Delhi, South and South East Delhi districts are showing a deeper water level in winter monsoon season. Water level fluctuation map of November 2024 vs January 2025 shows that Water level is declining with the fluctuation of 0-2 meter in South East, South West, South, North and New Delhi districts. Water level fluctuation map of November 2024 vs January 2025 clearly depict that 30.09 % of the area is showing 0 -2 range of decline in water level. However, the other parts of the State like North west, West, Central, North East, Shahdara and parts of North, South West district shows the rising water level situation which means these areas having recharge from rainfall and as well as from other sources.

The interpretation of decadal mean fluctuations reveals that New Delhi, South East, South West, West and South districts shows rise in water level greater than 4 meter and the districts like North East, Shahdara, East and some part of New Delhi and South district shows and decline in water level in the 2-4 meter. The 83.01 % area of NCT Delhi is showing rising trend due to strict regulation of CGWA guideline by State Government, Rainfall and intervention for recharging of Ground Water by State Government.

5. RECOMMENDATION

(I) Parts of New Delhi, South, North districts are showing rising water level and parts of North East, East and Shahdara district are showing decline water level, along with deeper water level (>10 m). So, in these districts Artificial Recharge, Roof Top Rain Water Harvesting (RTRWH) should be promoted so that water will get recharged. Other than that surface water supply may be provided for reducing ground water extraction. Dual water supply system can also be promoted with the use of treated waste water.

(II) In the parts of districts like East, South East, South West and Central where water level is in the rising trend of above 0.4 m/annum along with 5 – 10 m water level range, tube wells may be constructed with sustainable development coupled with Artificial Recharge measures.

(III) In the parts of district like North East, North West, South West, New Delhi, Central, North water logging problem occurs, (Water level in the range of 2 – 5 mbgl), dewatering is required by over pumping of Ground Water.

(IV) The Urban Development (UD) department sent a DO letter to the CEO (DJB) regarding identifying the leakage points and preparing a complete mapping of pipelines. Delhi Jal Board (Water Supply) should stop the leakage of supply water so that groundwater extraction will be reduced by providing a proper supply of surface water.

(V) In Over Exploited Tehsils (OE), and Deeper water level areas the construction of RTRWHS compulsory in all Government and private buildings to increase Groundwater recharge. Also, an implementable notification must be issued for buildings having more than 100 Sq. m area.

(VI) For Horticulture purposes use STP water only and not Groundwater. NDMC and DJB have to take responsibility for providing STP water through tankers or pipelines. It is recommended to stop dependency on groundwater within one year for horticulture purposes.

(VII) Directorate of Environment to expedite issuance of guidelines for the regulation of the groundwater in line with the guidelines notified by the MoJS for control and regulation of groundwater extraction with pan-India applicability on 24.09.2020 and amendments dated 29.03.2023.

(VIII) In areas, where extraction is more, NOC for groundwater extraction is only issued when they have to maintain the balance of the quantity of extraction water and the same or more than extraction, water has to recharge. Otherwise, no NOC will be issued.