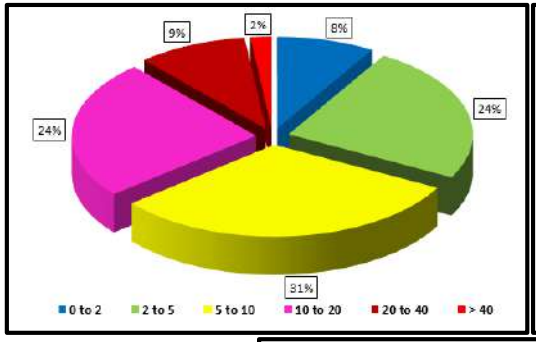

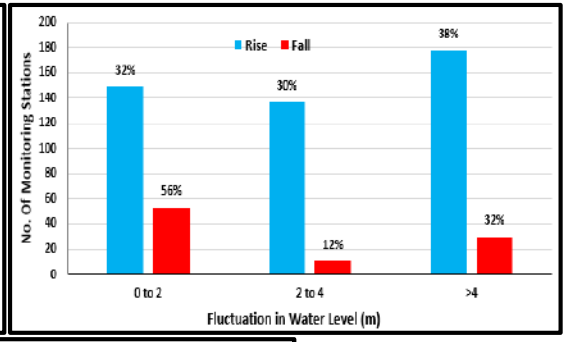

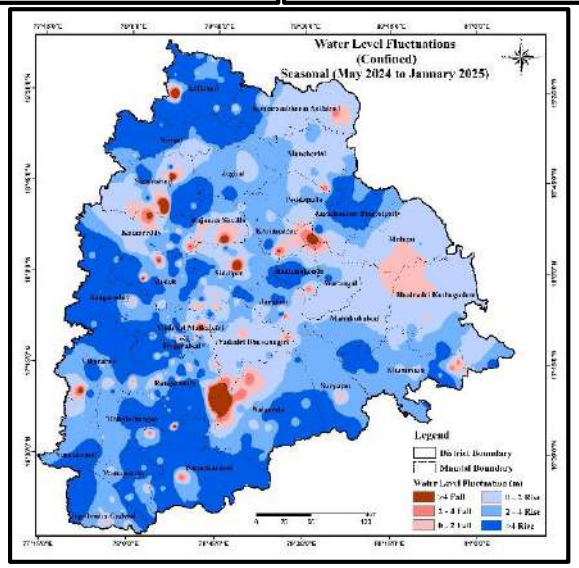

GROUND WATER LEVEL BULLETIN

January 2025

TELANGANA STATE

ABSTRACT

Ground water level Scenario during January-2025 highlighting and its seasonal, annual and decadal comparison.

CGWB, SOUTHERN REGION, HYDERABAD

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 attribute of groundwater regime monitoring is 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 Ground Water Board. A network of 1281 observation wells called **National Hydrograph Network Stations (NHNS)**, as on 31.03.2024, located in Telangana State is being monitored.

2.0 STUDY AREA

Telangana State is the 29th State (Act, 2014) formed in India covering geographical area of 1,12,077 Km^2 (after transferring 107 villages from Khammam district to residual Andhra Pradesh). It lies between NL 15° 48' and 19° 54'and EL 77° 12' and 81° 50'.The state is bordered by Maharashtra state in the north, Karnataka state in the west, Andhra Pradesh state in the south and east and Chhattisgarh state in the north-east. Administratively, the State comprises of 33 districts and governed by 620 revenue mandals (blocks/tehsils) with 10,434 revenue villages. The largest district is Bhadradri Kothagudem whereas Hyderabad is the smallest district. The total population of the state is ~3.5 crores with sex ratio of 988 (2011 census), of which 61 % lives in rural area and 39 % in urban area. The density of population is 312 per sq. km. The decadal growth in population is ~13.6 % (2001 to 2011 census).

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

Physiographically, Telangana state is occupied by western Pediplains except a fringe of Eastern Ghats in the northeastern part of Khammam district. The Pediplains depict rolling topography with flat to undulating tracts. The state extends largely between elevations of 150 to 600 mamsl except at places where it is overlain by basaltic lava flows, the elevation of which ranges from 600 to 900 m amsl.

The state is underlain by diverse rock types of different geological ages from Pre-Cambrian to Recent. Nearly 81 % of the state area is underlain by crystalline rocks (consolidated formations) belonging to the Peninsular Gneissic Complex, Dharwar and Eastern Ghats of Archaean to Middle Proterozoic age, Pakhal Group of rocks belonging to Middle to Upper Proterozoic age and Deccan Traps.

The remaining part of the state is underlain by semi consolidated sedimentary formations comprising Gondwana's, Tertiaries and Sub-Recent to Recent Unconsolidated Alluvium.

3.0 GROUND WATER LEVEL MONITORING

Central Ground Water Board, Southern Region, is monitoring changes in groundwater regime in Telangana 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 January, 2025 was 1281 which include 274 dug wells and 1007 piezometers. In January 2025, 1228 wells monitored (1214 water level recorded, 4 Autoflow wells and 10 dry), while 53 wells (3 dug wells and 50 piezometers) could not be monitored due to various reasons like inaccessibility, filled up, installation of pump units, road damaged, gate locked etc. Ten wells were abandoned in January 2025 monitoring period. The number of operational wells after completion of January 2025 monitoring stands at 1271, which include 270 dug wells and 1001 Bore wells. The district-wise breakup of the water level monitoring stations is given in **Table-1**.

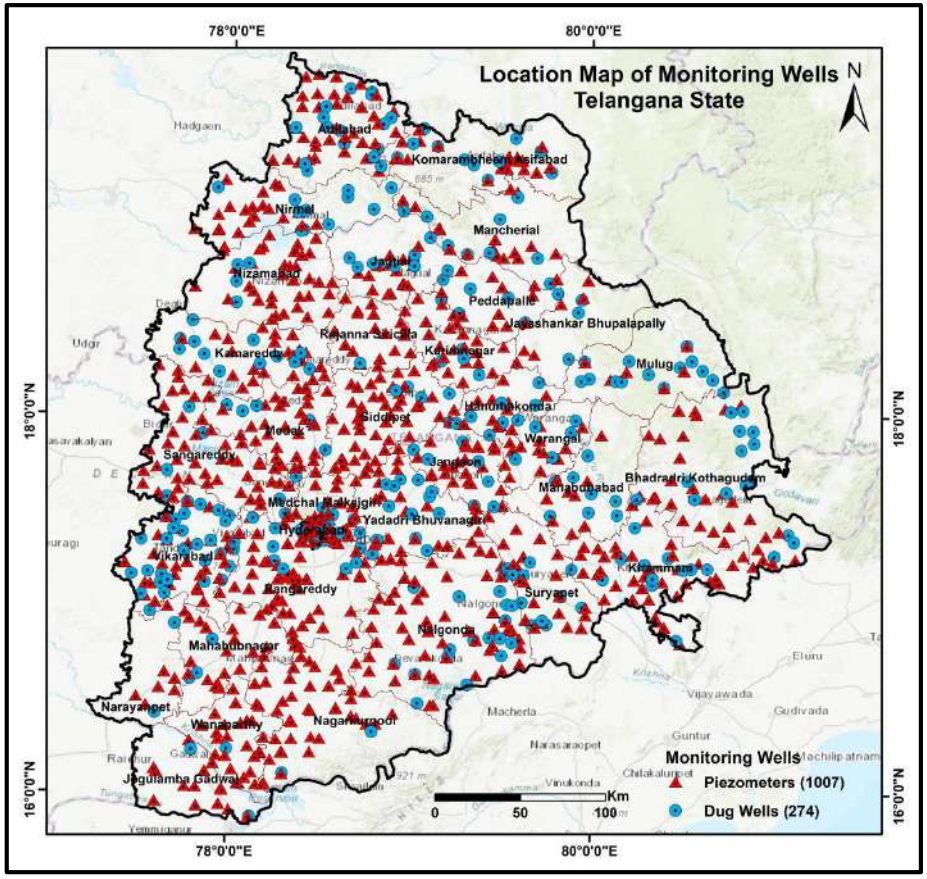

Figure- 2: Map showing locations of monitoring wells (GWMWS) in Telangana State

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

SR. No.	District	Number of Water Level Monitoring Stations				
		2022	2023	2024		
		Total	Total	DW	PZ	Total
1	Adilabad	**51**	55	16	39	55
2	Bhadradri Kothagudem	**73**	73	15	58	73
3	Hanamkonda	**18**	18	4	14	18
4	Hyderabad	**25**	28	8	20	28
5	Jagtial	**25**	24	8	16	24
6	Jangaon	**42**	42	9	33	42
7	Jayashankar Bhupalapally	**14**	14	3	11	14
8	Jogulamba Gadwal	**17**	17	3	14	17
9	Kamareddy	**25**	39	12	27	39
10	Karimnagar	**23**	26	5	21	26
11	Khammam	**68**	69	12	57	69
12	Komarambheem Asifabad	**39**	42	10	32	42
13	Mahabubabad	**21**	21	8	13	21
14	Mahabubnagar	**28**	26	3	23	26
15	Mancherial	**32**	33	10	23	33
16	Medak	**38**	38	5	33	38
17	Medchal Malkajgiri	**20**	39	3	36	39
18	Mulugu	**23**	21	14	7	21
19	Nagarkurnool	**46**	47	2	45	47
20	Nalgonda	**80**	81	17	64	81
21	Narayanpet	**12**	12	2	10	12
22	Nirmal	**34**	33	8	25	33
23	Nizamabad	**42**	42	5	37	42
24	Peddapalli	**18**	20	6	14	20
25	Rajanna Sircilla	**21**	21	1	20	21
26	Rangareddy	**73**	95	13	82	95
27	Sangareddy	**60**	65	6	59	65
28	Siddipet	**51**	53	5	48	53
29	Suryapet	**34**	34	11	23	34
30	Vikarabad	**66**	65	29	36	65
31	Wanaparthy	**25**	26	1	25	26
32	Warangal	**20**	20	7	13	20
33	Yadadri Bhuvanagiri	**43**	42	13	29	42
	Total	**1207**	**1281**	**274**	**1007**	**1281**

4.0 RAIN FALL

The rainfall data collected and compiled from weekly and monthly weather reports from Telangana State Development Society (TSDPS) were used to analyze the rainfall for the period June 2024 – Dec 2024. Table-2 gives the district-wise rainfall data for the period June-Dec 2023 & 2024, normal and the departure of June-Dec 2024 rainfall with other periods.

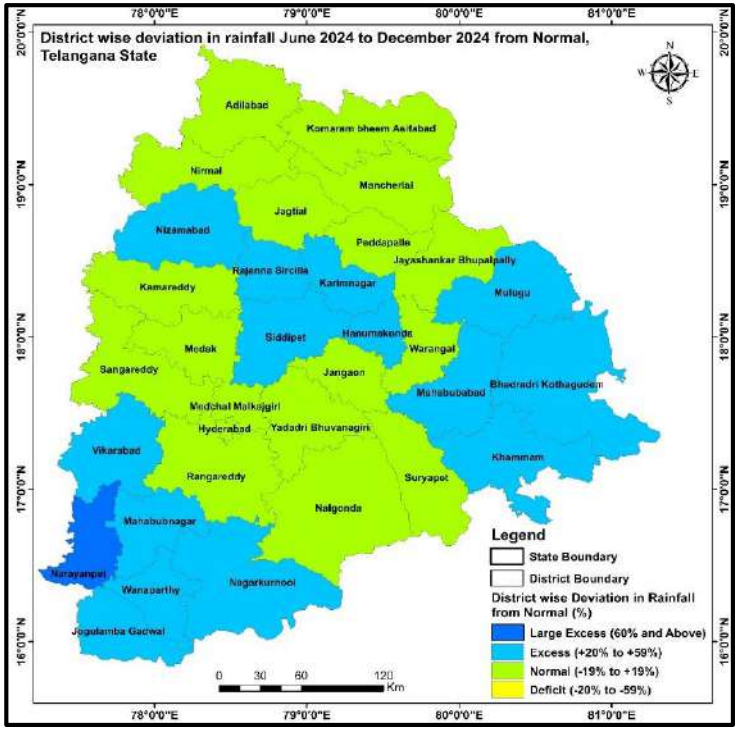

Figure-3: Rainfall deviation (June 2024 - December 2024) from normal rainfall

Table-2: District wise variability of rainfall in Telangana State (2024)

S. No.	District	Rainfall (June 24- Dec 24)	Rainfall (June 23 to Dec 23)	Normal Rainfall	Departure from 2023 (%)	Departure from Normal (%)	Status
1	Adilabad	1104	1182.8	1050	-7%	5%	Normal
2	Bhadradri Kothagudem	1317	1152.4	1088	14%	21%	Excess
3	Hanumakonda	986	1126.3	807	-13%	22%	Excess
4	Hyderabad	868	783.5	761	11%	14%	Normal
5	Jagtial	1058	1148.1	921	-8%	15%	Normal
6	Jangaon	829	865.9	799	-4%	4%	Normal
7	Jayashankar	1164	1352.8	1082	-14%	8%	Normal
8	Jogulamba Gadwal	782	422	551	85%	42%	Excess
9	Kamareddy	989	1067.4	892	-7%	11%	Normal
10	Karimnagar	1025	989.6	813	4%	26%	Excess
11	Khammam	1213	845.6	945	43%	28%	Excess
12	Kumuram Bheem	1223	1102.1	1069	11%	14%	Normal
13	Mahabubabad	1292	997.9	1008	29%	28%	Excess
14	Mahabubnagar	926	609.2	633	52%	46%	Excess
15	Mancherial	1044	1099.9	1049	-5%	0%	Normal
16	Medak	918	998	889	-8%	3%	Normal
17	Medchal-Malkajgiri	771	806.1	677	-4%	14%	Normal
18	Mulugu	1625	1433.2	1098	13%	48%	Excess
19	Nagarkurnool	881	503.2	625	75%	41%	Excess
20	Nalgonda	803	428.7	694	87%	16%	Normal
21	Narayanpet	944	584.1	565	62%	67%	L. Excess
22	Nirmal	1133	1269.7	989	-11%	15%	Normal
23	Nizamabad	1135	1239.1	930	-8%	22%	Excess
24	Peddapalli	1057	998.7	986	6%	7%	Normal
25	Rajanna Sircilla	971	1090.3	802	-11%	21%	Excess
26	Rangareddy	772	570.5	686	35%	13%	Normal
27	Sangareddy	909	838.5	818	8%	11%	Normal
28	Siddipet	945	748.1	738	26%	28%	Excess
29	Suryapet	888	656.3	773	35%	15%	Normal
30	Vikarabad	943	774.6	783	22%	20%	Excess
31	Wanaparthy	951	559.8	674	70%	41%	Excess
32	Warangal	1111	1140.3	1030	-3%	8%	Normal
33	Yadadri Bhuvanagiri	735	640.8	692	15%	6%	Normal
	State Total	**1009**	**910**	**846**	**11%**	**19%**	**Normal**

Category was defined based on the departures from normal values: **Normal**: -19% to 19%; **Excess**: 20% to 59%; **L. Excess**: > 60%; **Deficit**: -20% to -59%

5.0 GROUND WATER LEVEL SCENARIO (January 2025)

5.1 SHALLOW AQUIFER (UNCONFINED)

5.1.1 DEPTH TO WATER LEVEL

Depth to Water Level in Unconfined Aquifer (January 2025)

Analysis of depth to water level data of 626 wells shows water levels vary between 0.08 m bgl (Nagarkurnool district) to 63.12 m bgl (Komarambheem Asifabad district). Water level of less than 2 m bgl is recorded in 11% of wells, between 2 and 5 m bgl in 38% of wells,between 5 and 10 m bgl in 35% of wells, between 10 and 20 m bgl in 18% of wells, between 20 and 40 m bgl in 2% of wells and >40 m bgl in 1% of wells.

Shallow water level of less than 2 m bgl is mainly observed in parts of Mahabubabad, Mulugu, Hanumakonda, Narayanpet, Suryapet, Peddapalle, Warangal, Khammam districts covering only an area of 1.4% of the State. Water levels of 2–5 mbgl, covering 36.8% of the area, are widespread across the state, especially in the eastern, southwestern, northeastern, and southeastern regions. 5 to 10 m bgl of water levels covering major part of State with an area of 48.1%, is mainly observed in parts of Kamareddy, B. Kothagudem, Vikarabad, Y. Bhuvanagiri, Rajanna Sircilla, Nirmal, M. Malkajgiri, Jangaon, Wanaparthy, Rangareddy, Sangareddy, Adilabad and Mahabubnagar districts. While 13% of the State is covered by 10 – 20 m bgl water levels in Medak, Sangareddy, Rangareddy, Siddipet, Nizamabad, Nalgonda, Nagarkurnool, Adilabad, Kamareddy, Y Bhuvanagiri, Hyderabad and Kumaram Bheem Asifabad districts. Deeper water levels exceeding 20 meters cover less than 1% of the area, found in small patches across Nagarkurnool, Adilabad, Medak, Sangareddy and Komarambheem Asifabad districts.

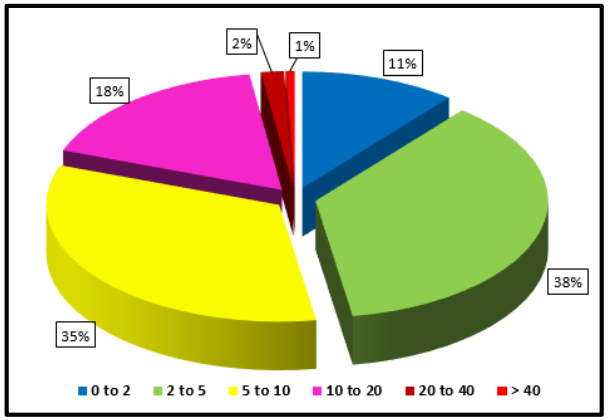

Figure-4: Percentage of wells in different water level ranges in unconfined aquifer.

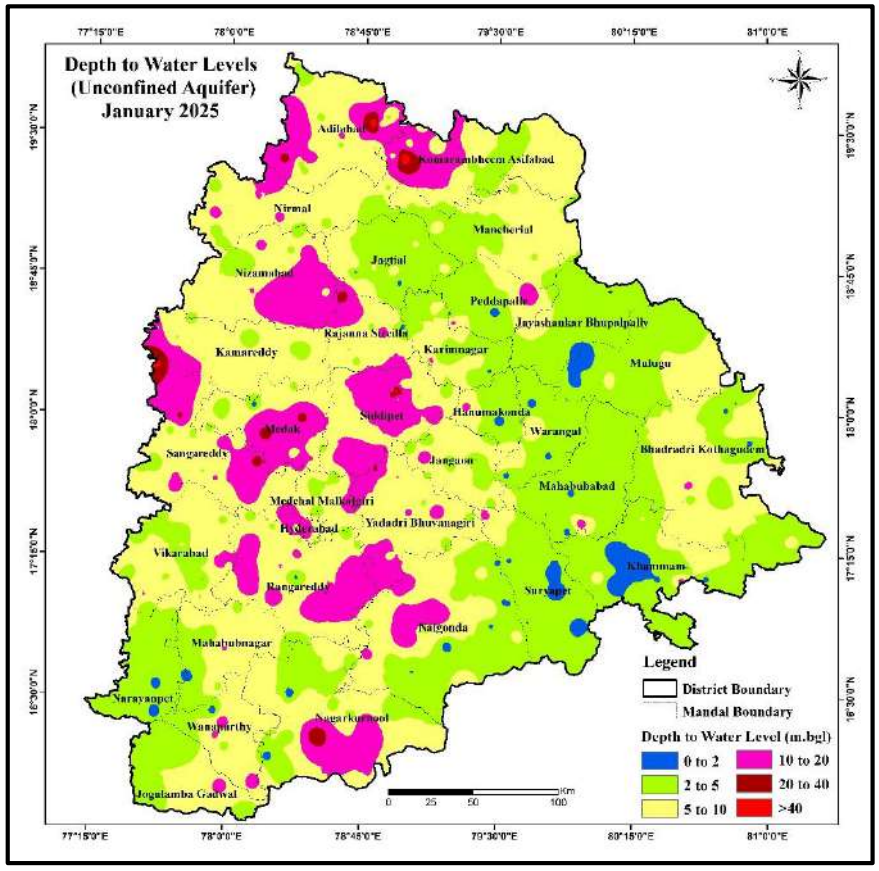

Figure-5: Depth to water level of unconfined aquifer during January 2025.

5.1.2 SEASONAL FLUCTUATION IN WATER LEVEL

Seasonal Fluctuation of Water Level in Unconfined Aquifer (May 2024 to January 2025)

Analysis of data of 592 wells shows that water level rise is recorded in 90% wells (533 wells), water level fall is recorded in 10% wells (59 wells).

Rise in Water Levels:

Out of 533 wells, water level rise of less than 2 m is recorded in 38% wells, 2 to 4 m in 36% wells and more than 4 m in 26% of the wells. Water level rise of less than 2 m is seen mostly in northeastern to eastern part of the state. Water level rise of 2 to 4 m is observed mainly in parts of Mahabubabad, B. Kothagudem, Nizamabad, Rangareddy, Rajanna Sircilla, Kamareddy, Mulugu, Mancherial, Suryapet, Khammam, Nirmal, Warangal, Nalgonda and Karimnagar districts. Rise of more than 4 m is mainly observed in parts of Adilabad, K. Asifabad, Nizamabad, Nirmal, Rajanna Sircilla, Medak, Nagakurnool, Sangareddy, Suryapet, Vikarabad, Jangaon, Wanaparthy, Warangal, Narayanpet, J Gadwal, Siddipet, Mahabubnagar, Mancherial and Hanumakonda districts.

Fall in Water Levels:

Out of 59 wells that have registered fall in water levels, 63% have recorded less than 2 m while 15% in the range of 2 to 4 m and remaining 22% wells registered water level fall of more than 4 m. Fall of less than 2 m is mainly observed in parts of Y. Bhuvanagiri, Nalgonda, Medak, Kamareddy, Karimnagar, J Bhupalpally, Adilabad, K Asifabad and M. Malkajgiri districts. Fall of 2 to 4 m is observed mainly in Y. Bhuvanagiri, Rangareddy, Adilabad J Gadwal and Sangareddy districts. Fall of >4 m is mainly observed in Medchal Malkajgiri, Kamareddy, Rangareddy, Sangareddy, Y. Bhuvanagiri, Suryapet, J Gadwal and Adilabad districts.

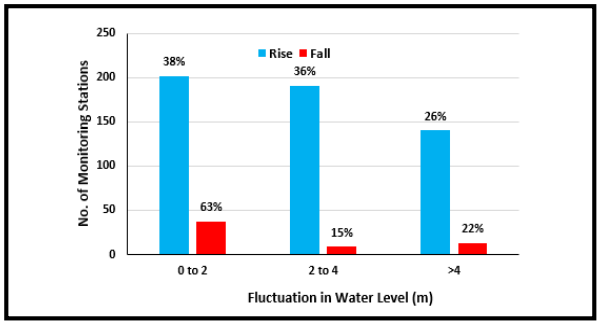

Figure-6: Percentage of wells showing rise and fall in WL in unconfined aquifer (May 2024 to January 2025)

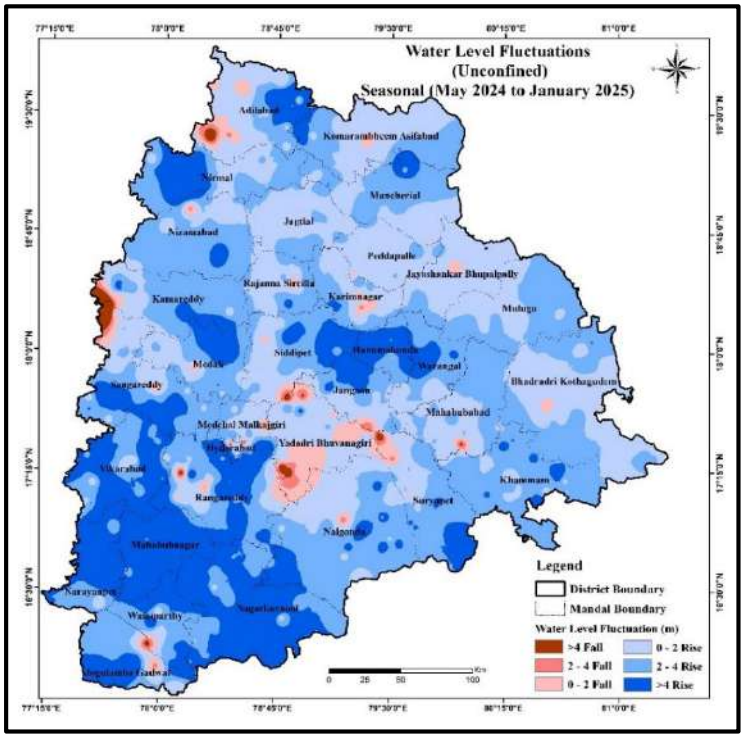

Figure-7: Seasonal water level fluctuation in unconfined aquifer (May 2024 to January 2025)

Seasonal Fluctuation of Water Level in Unconfined Aquifer (August 2024 to January 2025)

Analysis of data of 619 wells shows that water level rise is recorded in 43% wells (269 wells), water level fall is recorded in 57% wells (350 wells).

Rise in Water Levels:

Out of 269 wells, water level rise of less than 2 m is recorded in 57% wells, 2 to 4 m in 25% wells and more than 4 m in 17% of the wells. Water level rise of less than 2 m is seen mostly in Yadadri Bhuvanagiri, Nalgonda, Rangareddy, Medak, Hanumakonda, Jangaon districts of the state. Water level rise of 2 to 4 m is observed mainly in Mahabubnagar, Medak, Narayanpet, Nalgonda districts. Rise of more than 4 m is seen majorly in Mahabubnagar, Yadadri Bhuvanagiri, Nalgonda, Medchal Malkajgiri, Nagarkurnool, Vikarabad, Jangaon, Medak districts.

Fall in Water Levels:

Out of 350 wells that have registered fall in water levels, 61% have recorded less than 2 m while 22% in the range of 2 to 4 m and remaining 17% wells registered water level fall of more than 4 m. Fall of less than 2 m is mainly observed in parts of Nizamabad, Jagtial, Mancherial, Peddapalle, J Bhupalpally, Mulugu, Karimnagar, B Kothagudem, Warangal, Mahabubabad and Wanaparthy districts. Fall of 2 to 4 m is observed mainly in Adilabad, K Asifabad, Nirmal, Siddipet, Nagarkurnool, Mulugu districts. Fall of >4 m is mainly observed in Adilabad, K Asifabad, Nirmal, Sangareddy, Kamareddy, Nagarkurnool, Wanaparthy, Siddipet, Peddapalle districts.

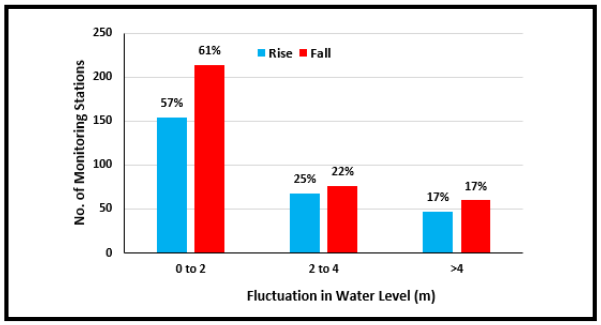

Figure-8: Percentage of wells showing rise and fall in WL in unconfined aquifer (August 2024 to January 2025)

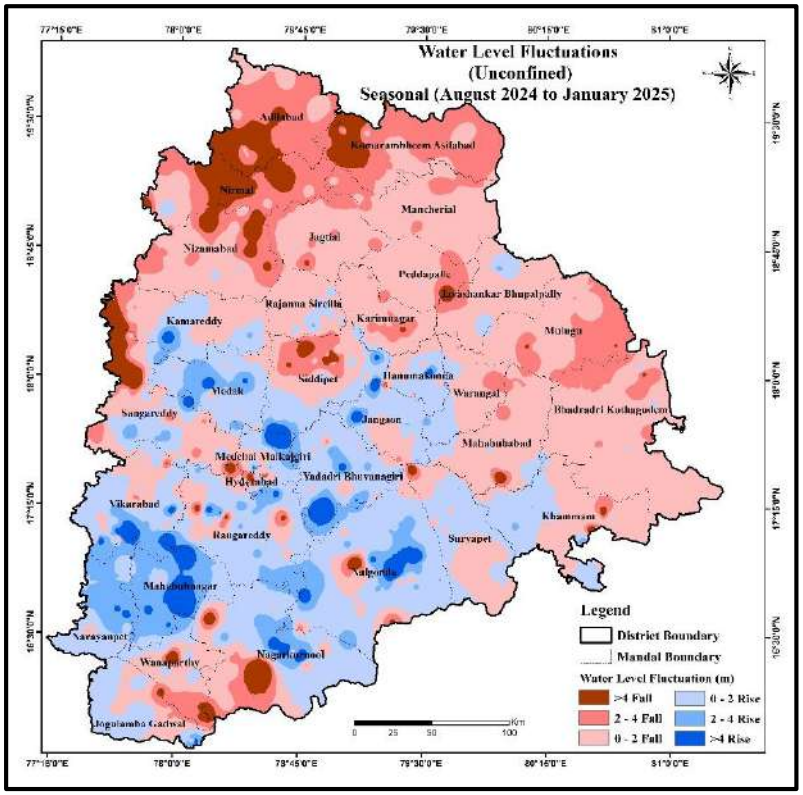

Figure-9: Seasonal water level fluctuation in unconfined aquifer (August 2024 to January 2025)

Seasonal Fluctuation of Water Level in Unconfined Aquifer (November 2024 to January 2025)

Analysis of data of 607 wells shows that water level rise is recorded in 18% wells (110 wells), water level fall is recorded in 82% wells (497 wells).

Rise in Water Levels:

Out of 110 wells, water level rise of less than 2 m is recorded in 73% wells, 2 to 4 m in 16% wells and more than 4 m in 11% of the wells. Water level rise of less than 2 m is seen mostly in Jayashankar Bhupapally, Suryapet, Nalgonda, Nagarkurnool, Narayanpet, Vikarabad, Hanumakonda, Warangal, Siddipet, Medchal Malkajgiri, Mahabubnagar districts. Water level rise of 2 to 4 m is seen as isolated patches in Medchal Malkajgiri, Hanumakonda, Nagarkurnool, Vikarabad, Siddipet, Sangareddy and Nalgonda districts. Rise of more than 4 m is seen as isolated patches in parts of Medchal Malkajgiri, Hanumakonda, Nagarkurnool, Vikarabad, Sangareddy and Nalgonda districts

Fall in Water Levels:

Out of 497 wells that have registered fall in water levels, 65% have recorded less than 2 m while 19% in the range of 2 to 4 m and remaining 15% wells registered water level fall of more than 4 m. Fall of less than 2 m is widespread across the state. Fall of 2 to 4 m is observed mainly in Adilabad, K Asifabad, Nirmal, Nizamabad, Jagtial, Kamareddy, Rajanna Sircilla, Siddipet, Medak, Sangareddy, Rangareddy, Nalgonda, Jangaon, Wanaparthy, Khammam, Hyderabad districts etc. Fall of >4 m is mainly observed in Adilabad, K Asifabad, Nirmal, Nizamabad, Jagtial, Kamareddy, Rajanna Sircilla, Siddipet, Medak, Sangareddy, Rangareddy, Nalgonda, Jangaon, Wanaparthy, Khammam, Mahabubabad districts.

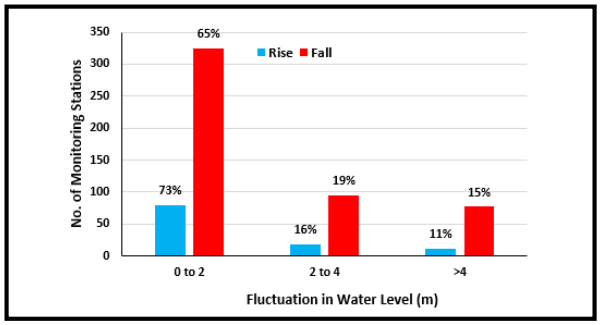

Figure-10: Percentage of wells showing rise and fall in WL in unconfined aquifer (November 2024 to January 2025)

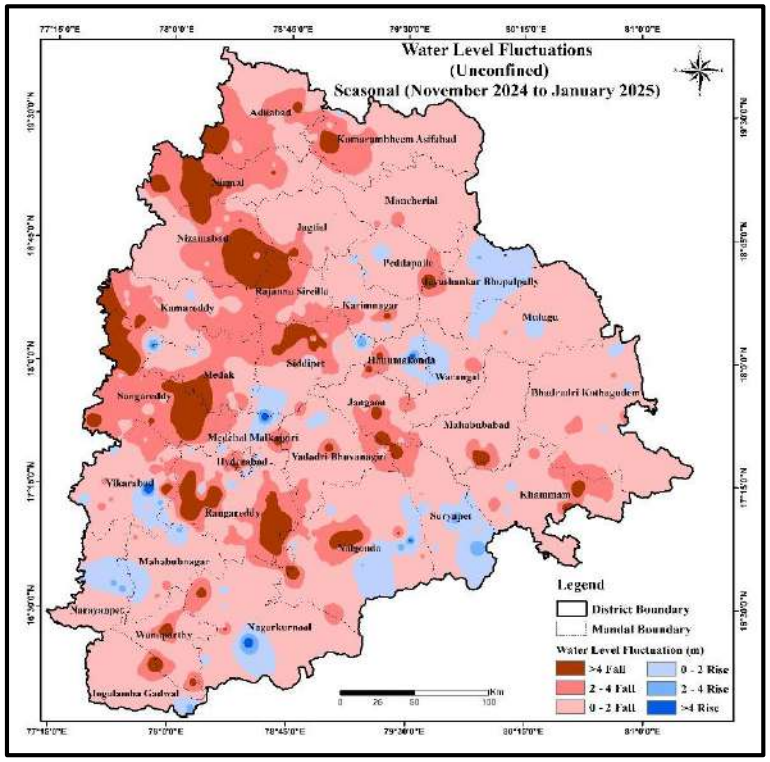

Figure-11: Seasonal water level fluctuation in unconfined aquifer (November 2024 to January 2025)

5.1.3 ANNUAL FLUCTUATION IN WATER LEVEL

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

Analysis of data of 578 wells shows that water level rise is recorded only in 65% wells (373 wells), water level fall is recorded in 35% wells (205 wells).

Rise in Water Levels:

Out of 578 wells, water level rise of less than 2 m is recorded in 72 % wells, 2 to 4 m in 20 % wells and more than 4 m in 8 % of the wells. Water level rise of less than 2 m is widely spread across the state and seen in almost all districts. Water level rise of 2 to 4 m is mainly observed in Nalgonda, Nagarkurnool, Karimnagar, Wanaparthy, Vikarabad, J Gadwal, Suryapet, Mahabubnagar, Medak, Narayanpet, Hanumakonda districts. Water level rise of more than 4 m is significantly observed in parts of Nalgonda, Nagarkurnool, J Gadwal, Mahabubnagar, Medak, Narayanpet, Vikarabad, Khammam and Hanumakonda districts.

Fall in Water Levels:

Out of the 205 wells that have registered fall in water levels, 70% have recorded less than 2 m while 11 % in the range of 2 to 4 m and remaining 19 % wells registered water level fall of more than 4 m. Fall of less than 2 m is observed in Central, northwestern, northern and extreme eastern part of the State. Fall of 2 to 4 m, recorded in Adilabad, Jangaon, Siddipet, Medak, Rangareddy, Sangareddy, Y Bhuvanagiri, Hyderabad, Kamareddy and M. Malkajgiri districts. Fall beyond 4 m is recorded mainly in parts of Adilabad, Siddipet, Medak, Sangareddy, Kamareddy, Y Bhuvanagiri, Hyderabad, Medchal Malkajgiri and Rangareddy districts.

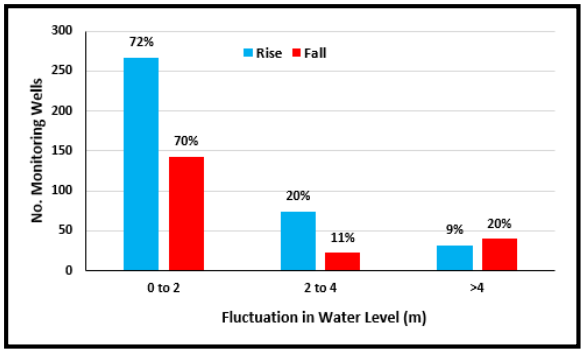

Figure-12: Percentage of wells showing rise and fall in WL in unconfined Aquifer(January 2024 to January 2025)

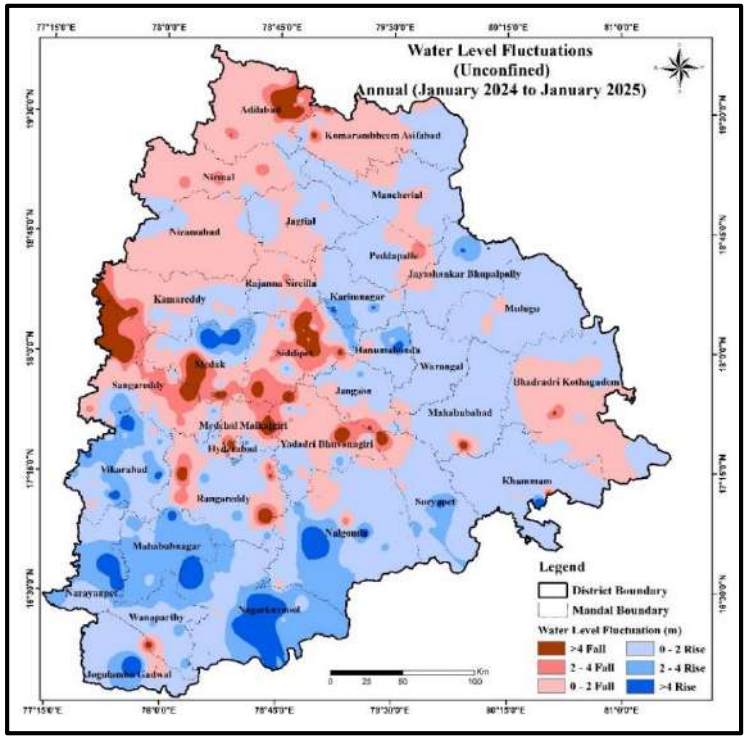

Figure-13: Annual water level fluctuation in unconfined Aquifer (January 2024 to January 2025)

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

Analysis of data of 534 wells shows that water level rise is recorded only in 26% wells (138 wells), water level fall is recorded in 74% wells (396 wells).

Rise in Water Levels:

Out of 138 wells, water level rise of less than 2 m is recorded in 80 % wells, 2 to 4 m in 9 % wells and more than 4 m in 12 % of the wells. Water level rise of less than 2 m is seen in J Bhupalpally, Mulugu, Mahabubabad, Suryapet, B Kothagudem, Vikarabad, Narayanpet, Wanaparthy, Nagarkurnool, Hanumakonda, Karimnagar districts. Water level rise of 2 to 4 m is mainly observed in J Bhupalpally, Hanumakonda, Vikarabad, Khammam, Nalgonda, Wanaparthy, Jogulamba Gadwal districts. Water level rise of more than 4 m is significantly observed in parts of J Bhupalpally, Hanumakonda, Vikarabad, Khammam, Nalgonda, Medchal Malkajgiri districts.

Fall in Water Levels:

Out of the 396 wells that have registered fall in water levels, 62% have recorded less than 2 m while 21 % in the range of 2 to 4 m and remaining 17 % wells registered water level fall of more than 4 m. Fall of less than 2 m is widespread across the State. Fall of 2 to 4 m, recorded in Adilabad, Nirmal, K Asifabad, Nizamabad, Kamareddy, Medak, Sangareddy, Rangareddy, Y Bhuvanagriri, Jangaon, Nalgonda, Mahabubabad districts. Fall beyond 4 m is recorded mainly in parts of Rangareddy, Y Bhuvanagiri Adilabad, Siddipet, Medak, Sangareddy, Kamareddy, Hyderabad, Medchal Malkajgiri, Jangaon, Suryapet, Mahabubabad, Nagarkurnool, Wanaparthy, Jogulamba Gadwal districts.

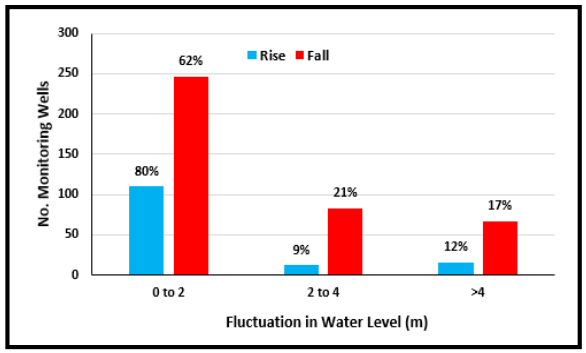

Figure-14: Percentage of wells showing rise and fall in WL in unconfined Aquifer (January 2023 to January 2025)

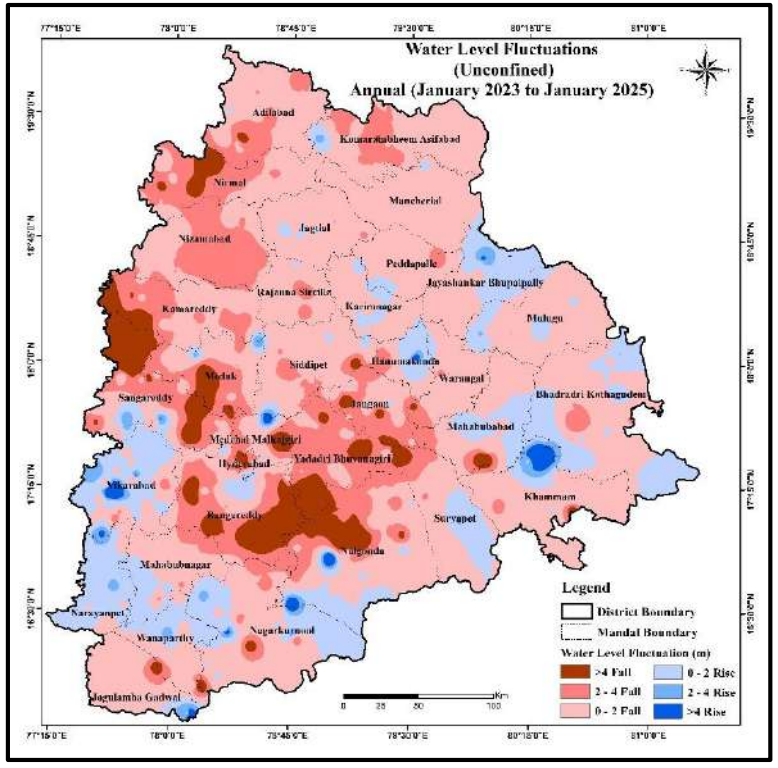

Figure-15: Annual water level fluctuation in unconfined Aquifer (January 2023 to January 2025)

5.1.4 DECADAL FLUCTUATION IN WATER LEVEL

Decadal Fluctuation of Water Level in Unconfined Aquifer (Decadal Mean to January 2025)

Analysis of data of 538 wells shows that water level rise is recorded in 56 % wells (302 wells), water level fall is recorded in 44% wells (236 wells).

Rise in Water Levels:

Out of 538 wells, water level rise of less than 2 m is recorded in 64 % wells, 2 to 4 m in 22 % wells and more than 4 m in 14 % of the wells. Water level rise of less than 2 m is majorly seen in Nalgonda, Suryapet, Khammam, Mahabubabad, Mulugu, Warangal, Hanamkonda, J Bhupalpally, Peddapalle, Mancherial, Karimnagar, Vikarabad, Narayanpet, Mahabubnagar, Wanaparthy, Rangareddy districts etc. Water level rise of 2 to 4 m is mainly observed in Nagarkurnool, J. Gadwal, Rangareddy, Hanumakonda, Sangareddy, Vikarabad, Nizamabad districts etc. Water level rise of more than 4 m is significantly observed in parts of Mahabubnagar, Sangareddy, Nagarkurnool, Wanaparthy, J. Gadwal, Rangareddy, Siddipet, Hanumakonda and Medchal Malkajgiri districts.

Fall in Water Levels:

Out of the 236 wells that have registered fall in water levels, 53 % have recorded less than 2 m while 21 % in the range of 2 to 4 m and remaining 26 % wells registered water level fall of more than 4 m. Fall of less than 2 m is recorded in in north-eastern, eastern and south-eastern parts of the state. Fall of 2 to 4 m is observed in Nagarkurnool, Rajanna Sircilla, Nirmal, Nalgonda, Y Bhuvanagiri, Warangal, Adilabad, K Asifabad, Sangareddy, Siddipet, Khammam, Vikarabad districts. Fall beyond 4 m is recorded mainly in parts of Sangareddy, Warangal, Nalgonda, Rangareddy, Rajanna Sircilla, Siddipet, Kamareddy, Nirmal, K Asifabad, Medchal Malkajgiri, Y Bhuvanagiri and Hyderabad districts.

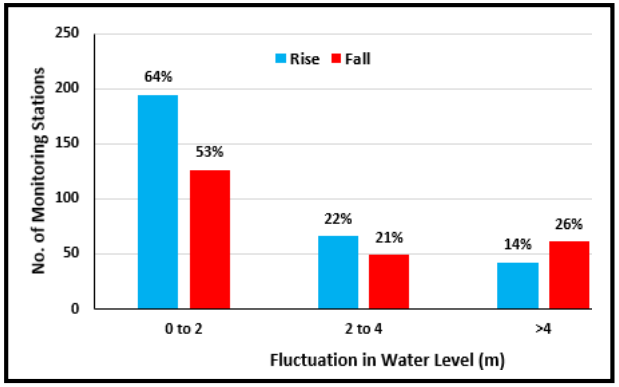

Figure-16: Percentage of wells showing rise and fall in WL in unconfined Aquifer (Decadal Mean to January 2025)

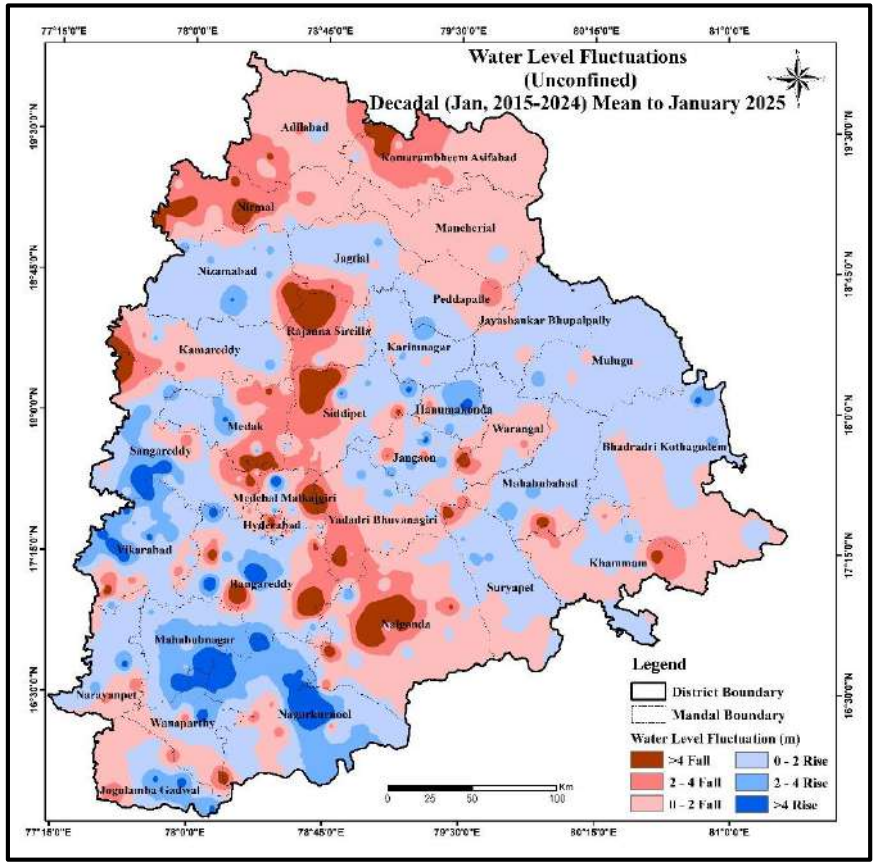

Figure-17: Decadal water level fluctuation in unconfined Aquifer (Decadal Mean to January 2025)

5.2 DEEPER AQUIFER (CONFINED/ SEMI-CONFINED)

5.2.1 DEPTH TO PIEZOMETRIC LEVEL

Depth to Piezometric Level in Confined/Semi-Confined Aquifer (January 2025)

Analysis of piezometric level data of 592 wells shows piezometric levels vary between 0.18 m bgl (B Kothagudem) to 58.69 m bgl (Vikarabad district). Piezometric level of less than 2 m bgl is recorded in 8% of wells, between 2 and 5 m bgl in 24% of wells, between 5 and 10 m bgl in 31% of wells, between 10 and 20 m bgl in 24% of wells, between 20 and 40 m bgl in 9% of wells and piezometric level more than 40 m bgl is registered in 2 % of wells.

Shallow piezometric level of less than 2 m bgl is mainly noticed in Mahabubabad, Bhadradri Kothagudem, Jagtial, Khammam, Nalgonda, Nagarkurnool, Wanaparthy and Mahabubnagar districts covering an area of 1.4 % of the State. Piezometric level of 2 to 5 m bgl mainly observed in parts of Mulugu, Bhadradri Kothagudem, Khammam, Mahabubabad, Warangal, Suryapet, Jagtial, Karimnagar, Wanaparthy, Mahabubnagar, Narayanpet, J Gadwal, Nagarkurnool and Nalgonda districts covering an area of 25% of the State. 37.6 % area of the State is covered by depth to piezometric level of 5 to 10 m bgl throughout the State. Piezometric level of 10 to 20 m bgl is covered in 31.1% of the State area in Rangareddy, Sangareddy, Vikarabad, Kamareddy, Adilabad, K.B. Asifabad, Medak, Siddipet, Nagarkurnool, Nizamabad, Bhadradi Kothagudem, Rajanna Sircilla, Peddapalle, J Bhupalpally, Medchal Malkajgiri and Hanumakonda districts. Deeper piezometric levels of more than 20 m covers < 5% area of the State, exist as isolated patches and mainly observed in parts of Bhadradi Kothagudem, Medak, Rangareddy, K.B. Asifabad, Adilabad, Siddipet, Vikarabad, Nizamabad, Nalgonda, Hyderabad, Hanumakonda and Sangareddy districts.

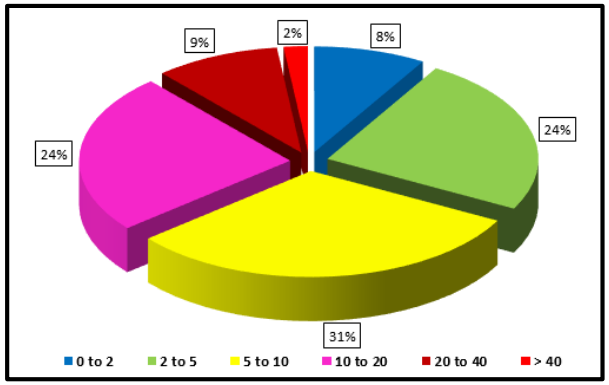

Figure-18: Percentage of wells in different piezometric levels (January 2025)

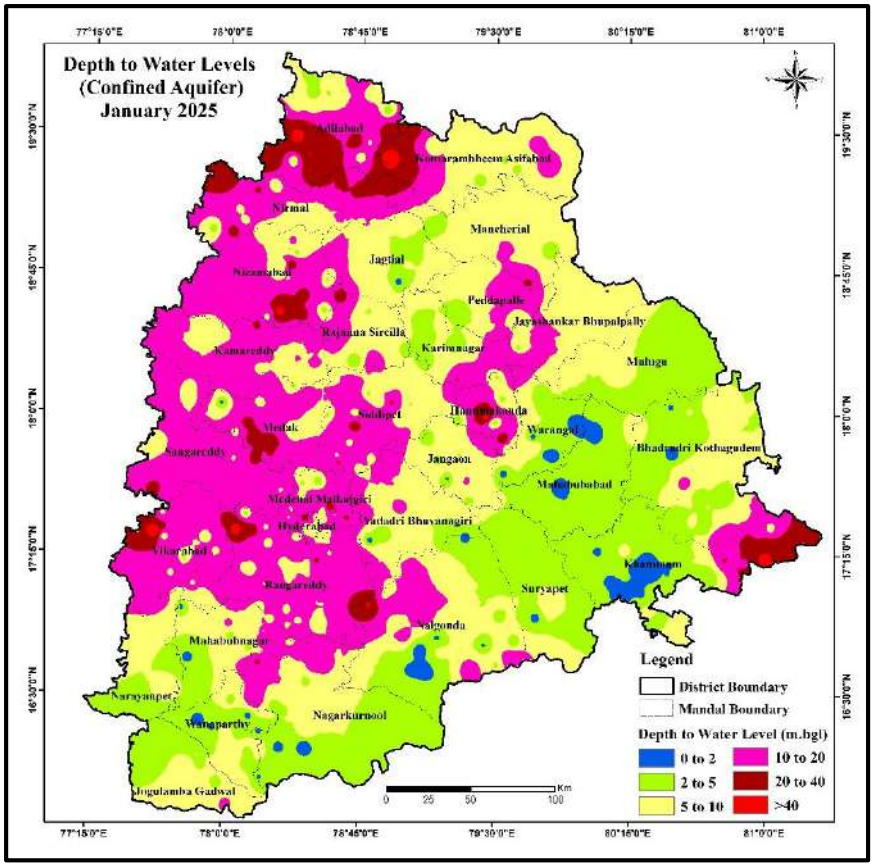

Figure-19: Depth to piezometric Level in deeper aquifer in January 2025.

5.2.2 SEASONAL FLUCTUATION IN PIEZOMETRIC LEVEL

Seasonal Fluctuation of Piezometric Level in Confined/ Semi-Confined Aquifer (May 2024 to January 2025)

Analysis of data of 558 wells shows that water level rise is recorded in 83% wells (464 wells), water level fall is recorded in 17% wells (94 wells).

Rise in Piezometric Levels:

Out of 464 wells, a piezometric level rise of less than 2 meters was recorded in 32% of the wells, 2 to 4 meters in 30%, and more than 4 meters in 38%. The rise of less than 2 meters was primarily observed in Mulugu, Bhadradri Kothagudem, Medchal Malkajgiri, Kamareddy, Warangal, Yadadri Bhuvanagiri, Rajanna Sircilla, Siddipet, and Nalgonda districts. A rise of 2 to 4 meters was mainly found in patches extending from the north-eastern to the south-western parts and in the south-eastern part of the state. A rise of more than 4 meters was observed in Sangareddy, Rangareddy, Nirmal, Nagarkurnool, Siddipet, Nalgonda, Hanumakonda, Adilabad, K Asifabad, J Bhupalpally, Wanaparthy, J Gadwal, Mahbubnagar districts etc.

Fall in Piezometric Levels:

Out of 94 wells that have registered fall in piezometric levels, 56% have recorded less than 2 m while 12% in the range of 2 to 4 m and remaining 32% wells registered piezometric level fall of more than 4 m. A fall of less than 2 meters was mainly observed in Nalgonda, Kamareddy, Komaram Bheem Asifabad, Mancherial, Adilabad, Mulugu, B Kothagudem, Rajanna Sircilla, Karimnagar and Nizamabad districts. A fall of 2 to 4 meters was observed in Nalgonda, Kamareddy, Komaram Bheem Asifabad, Adilabad, Mancherial, Nizamabad, Khammam, Medak and Vikarabad districts. A fall of more than 4 meters was observed mainly in parts of Nalgonda, Kamareddy, Nizamabad, Rajanna Sircilla, Karimnagar, Rangareddy, Hyderabad, Adilabad, and Vikarabad districts.

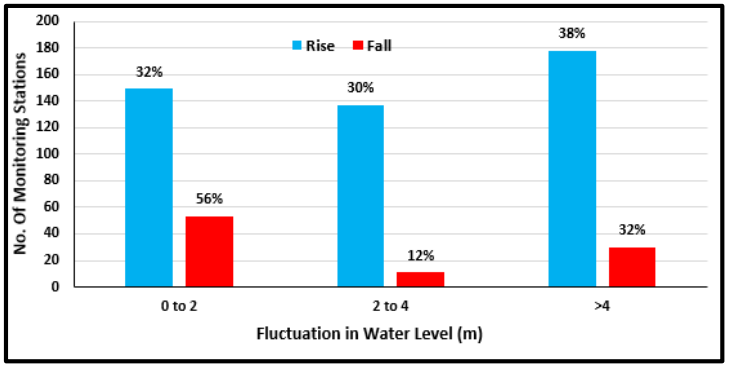

Figure-20: Percentage of wells showing rise and fall in piezometric level in confined/semi-confined aquifer (May 2024 to January 2025).

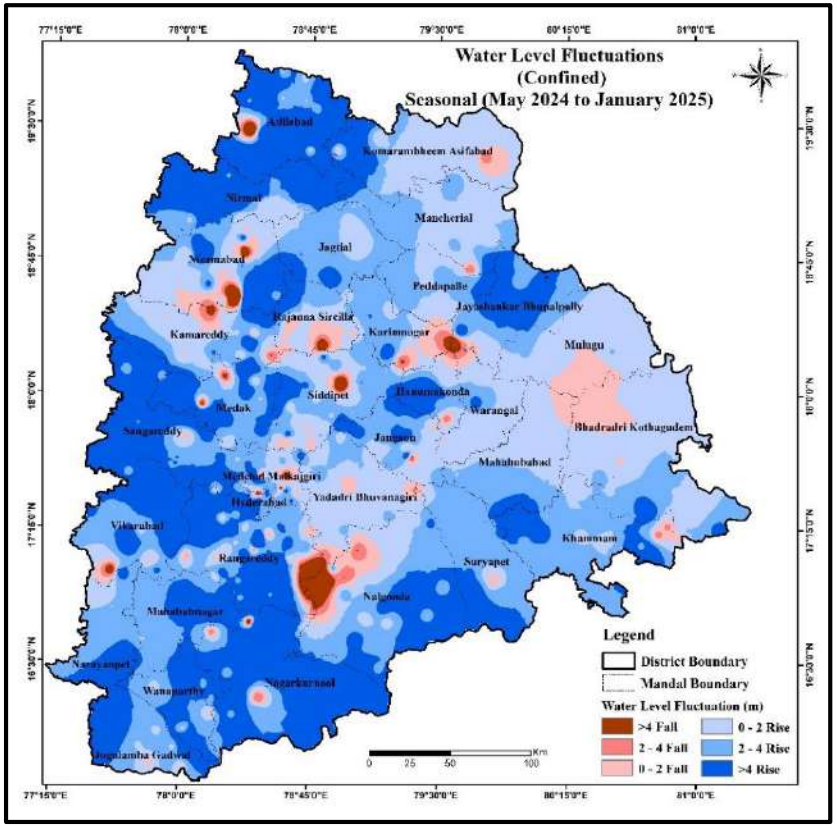

Figure-21: Annual water level fluctuation in piezometric level in confined/semi-confined aquifer (May 2024 to January 2025)

Seasonal Fluctuation of Piezometric Level in Confined/ Semi-Confined Aquifer (August 2024 to January 2025)

Analysis of data of 584 wells shows that water level rise is recorded in 43% wells (253 wells), water level fall is recorded in 57% wells (331 wells).

Rise in Piezometric Levels:

Out of 253 wells, a piezometric level rise of less than 2 meters was recorded in 54% of the wells, 2 to 4 meters in 21%, and more than 4 meters in 25%. The rise of less than 2 meters was primarily observed in Nagarkurnool, Nalgonda, Y Bhuvanagiri, Jangaon, Warangal, Narayanpet, Wanaparthy, J Gadwal, Mahabubnagar, Mahabubabad districts. A rise of 2 to 4 meters was mainly found in Nagarkurnool, Rangareddy, Medak, Siddipet, Nalgonda, Y Bhuvanagiri, Mahabubnagar districts. A rise of more than 4 meters was observed in Nagarkurnool, Rangareddy, Medak, Siddipet, Nalgonda, Y Bhuvanagiri, Mahabubnagar, Kamareddy, Nizamabad districts

Fall in Piezometric Levels:

Out of 331 wells that have registered fall in piezometric levels, 51% have recorded less than 2 m while 21% in the range of 2 to 4 m and remaining 25% wells registered piezometric level fall of more than 4 m. A fall of less than 2 meters is widespread across the state. A fall of 2 to 4 meters was observed in Kamareddy, Komaram Bheem Asifabad, Adilabad, Mancherial, Nizamabad, Khammam, Jagtial, Peddapalle, Hanumakonda, Vikarabad, Sangareddy, Medchal Malkajgiri, Mulugu, Nalgonda districts. A fall of more than 4 meters was observed mainly in parts of Nalgonda, Kamareddy, Nizamabad, Rajanna Sircilla, Karimnagar, Rangareddy, Hyderabad, Adilabad, Nirmal, Jagtial, Hanumakonda, Karimnagar, J Bhupalpally, Peddapalle and Vikarabad districts.

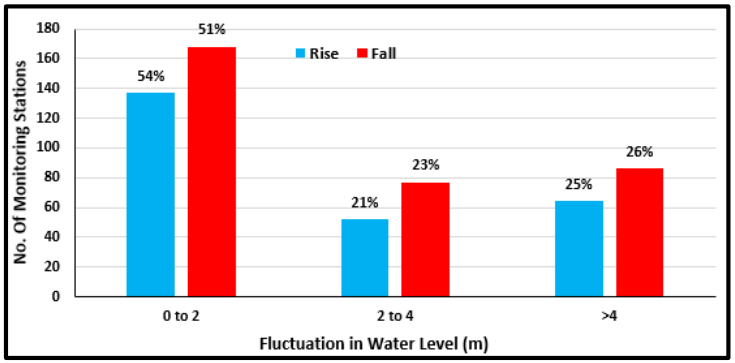

Figure-22: Percentage of wells showing rise and fall in piezometric level in confined/semi-confined aquifer (August 2024 to January 2025).

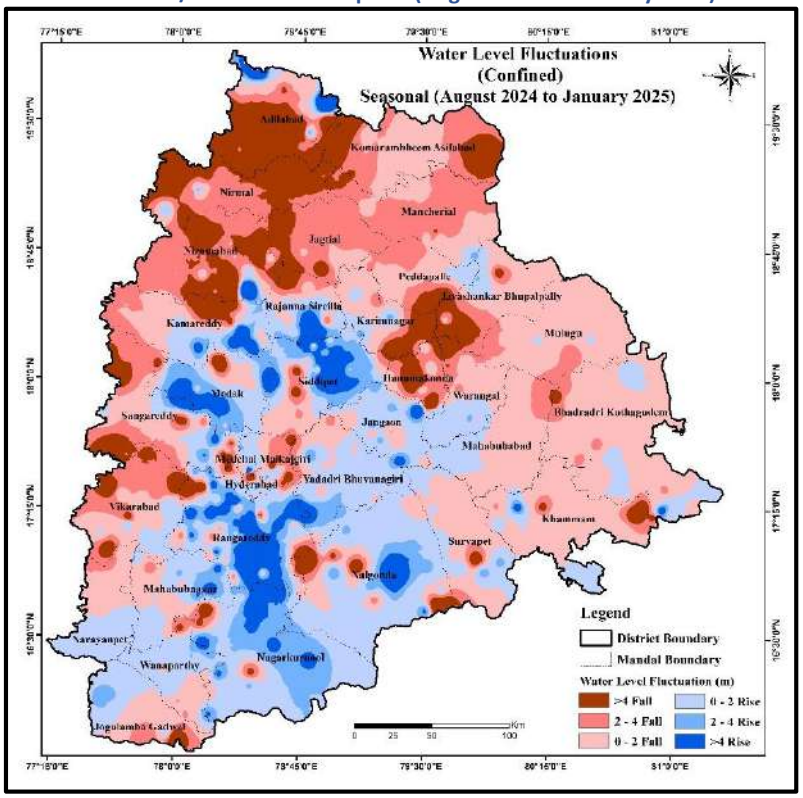

Figure-23: Annual water level fluctuation in piezometric level in confined/semi-confined aquifer (August 2024 to January 2025)

Seasonal Fluctuation of Piezometric Level in Confined/ Semi- Confined Aquifer (November 2024 to January 2025)

Analysis of data of 573 wells shows that water level rise is recorded in 16% wells (93 wells), water level fall is recorded in 84% wells (480 wells).

Rise in Piezometric Levels:

Out of 93 wells, a piezometric level rise of less than 2 meters was recorded in 55% of the wells, 2 to 4 meters in 20%, and more than 4 meters in 25%. The rise of less than 2 meters was primarily observed in Nagarkurnool, Nalgonda, Siddipet, J Bhupalpally, Khammam, B Kothagudem, Karimnagar, J Gadwal, Medak, Hyderabad districts. A rise of 2 to 4 meters was mainly found in Siddipet, Adilabad, Sangareddy, Medak, Hyderabad, Nagarkurnool, B Kothagudem, J Bhupalpally districts. A rise of more than 4 meters was observed in Nagarkurnool, Hyderabad, Medak, Siddipet, B Kothagudem, Nizamabad, Adilabad districts

Fall in Piezometric Levels:

Out of 480 wells that have registered fall in piezometric levels, 50% have recorded less than 2 m while 22% in the range of 2 to 4 m and remaining 28% wells registered piezometric level fall of more than 4 m. A fall of less than 2 meters is widespread across the state. A fall of 2 to 4 meters was observed in Kamareddy, Komaram Bheem Asifabad, Adilabad, Mancherial, Nizamabad, Jagtial, Peddapalle, Medak, Sangareddy, Mulugu, Vikarabad, Jangaon, Medchal Malkajgiri, Mulugu, Nalgonda districts. A fall of more than 4 meters was observed mainly in parts of Nalgonda, Kamareddy, Nizamabad, Karimnagar, Rangareddy, Adilabad, Nirmal, Jagtial, Hanumakonda, J Bhupalpally, Peddapalle, Sangareddy, Medak, B Kothagudem, Vikarabad districts.

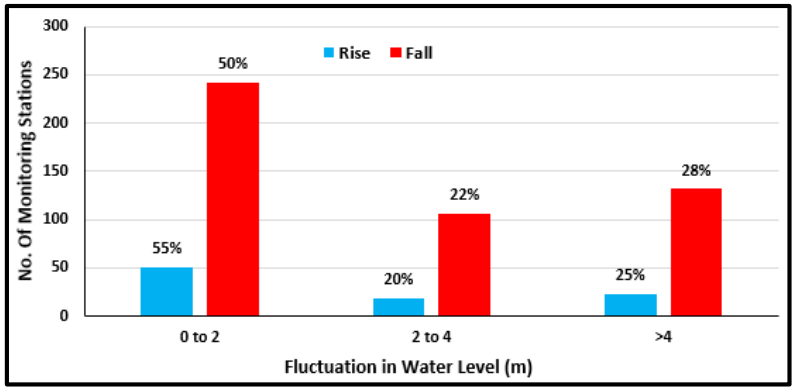

Figure-24: Percentage of wells showing rise and fall in piezometric level in confined/semi-confined aquifer (November 2024 to January 2025).

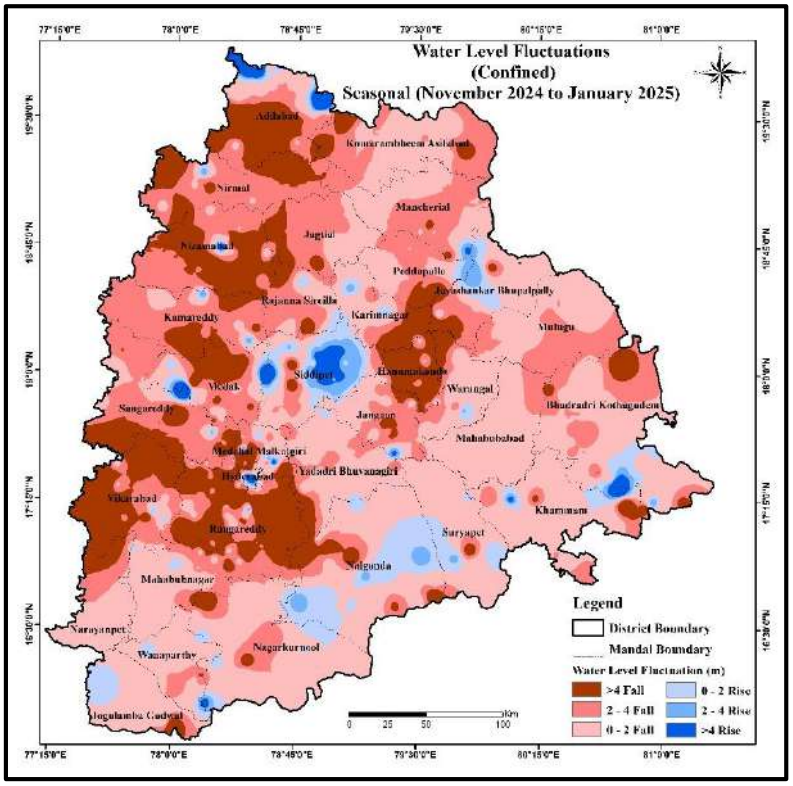

Figure-25: Annual water level fluctuation in piezometric level in confined/semi-confined aquifer (November 2024 to January 2025)

5.2.3 ANNUAL FLUCTUATION IN WATER LEVEL

Annual Fluctuation of Water Level in Confined/ Semi- Confined Aquifer (January 2024 to January 2025)

Analysis of data of 518 wells shows that water level rise is recorded in 50% wells (259 wells) while water level fall is recorded in 50% wells (259 wells).

Rise in Water Levels:

Out of 259 wells, water level rise of less than 2 m is recorded in 67% wells, 2 to 4 m in 15% wells and more than 4 m in 17% of the wells. Water level rise of less than 2 m is seen in all the districts, significantly throughout the State. Water level rise of 2 to 4 m is observed mainly in parts of Mahabubnagar, Nalgonda, Nagarkurnool, Suryapet, Khammam, Hanumakonda, Karimnagar, Adilabad, Siddipet, Medak, Wanaparthy, Sangareddy, Narayanpet, J Gadwal and Vikarabad districts. Water level rise of more than 4 m mainly observed in parts of Nalgonda, Nagarkurnool, Adilabad, Sangareddy, Siddipet, Medak, Hanumakonda, Karimnagar and Wanaparthy districts.

Fall in Water Levels:

Out of the 259 wells that have registered fall in water levels, 57% have recorded less than 2 m while 17% in the range of 2 to 4 m and remaining 26 % wells registered water level fall of more than 4 m. Fall of less than 2 m is observed in central, northern, north-eastern and north-western parts of the district. Fall of 2 to 4 m, recorded in parts of Bhadradri kothagudem, Adilabad, K. Asifabad, Nizamabad, Kamareddy, Siddipet, Sangareddy, Rajanna Sircilla, Y Bhuvanagiri and Vikarabad district. Fall beyond 4 mis recorded mainly in parts of Adilabad, Nirmal, Nizamabad, Vikarabad, M Malkajgiri, Siddipet, Rajanna Sircilla, Peddapalle, Mancherial, Rangareddy, J Bhupalpally, Karimnagar and Y Bhuvanagiri districts.

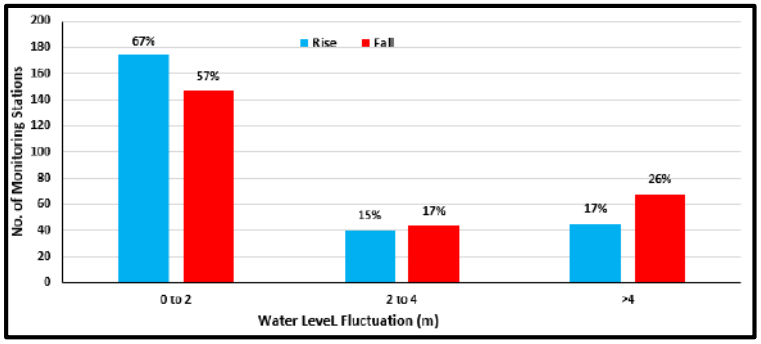

Figure-26: Percentage of wells showing rise and fall in piezometric level in confined/ semi-confined aquifer (January 2024 to January 2025).

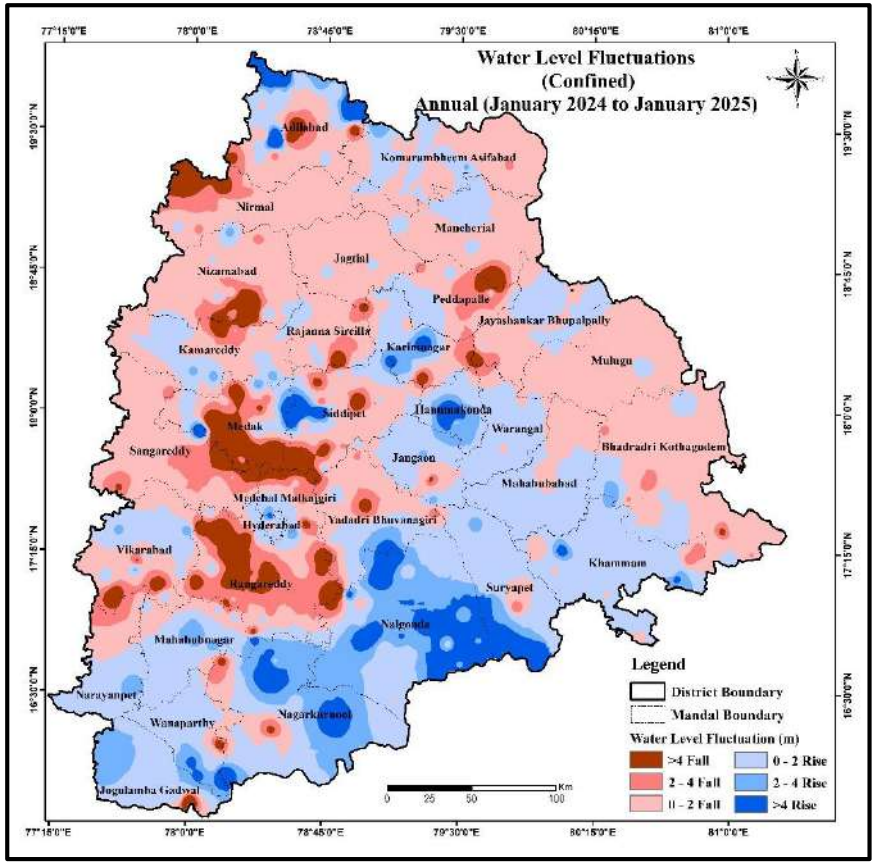

Figure-27: Annual water level fluctuation in piezometric level in confined/ semi-confined aquifer (January 2024 to January 2025)

Annual Fluctuation of Water Level in Confined/ Semi- Confined Aquifer (January 2023 to January 2025)

Analysis of data of 477 wells shows that water level rise is recorded in 20% wells (94 wells) while water level fall is recorded in 80% wells (383 wells).

Rise in Water Levels:

Out of 94 wells, water level rise of less than 2 m is recorded in 47% wells, 2 to 4 m in 7% wells and more than 4 m in 18% of the wells. Water level rise of less than 2 m is seen in all the districts, significantly throughout the State. The rise of less than 2 meters was primarily observed in Nagarkurnool, Nalgonda, Siddipet, J Bhupalpally, Khammam, B Kothagudem, J Gadwal, Medak, Jagtial, Wanaparthy, Jangaon, Mahabubabad, Suryapet districts. A rise of 2 to 4 meters was mainly found in Siddipet, Medak, Nagarkurnool, J Bhupalpally, Khammam, Jagtial, Macherial, Peddapalle districts. A rise of more than 4 meters was observed in Nagarkurnool, Medak, Siddipet, J Bhupalpally, Khammam, Jagtial, Macherial, Peddapalle Jangaon, Wanaparthy districts

Fall in Water Levels:

Out of the 383 wells that have registered fall in water levels, 50% have recorded less than 2 m while 20% in the range of 2 to 4 m and remaining 31% wells registered water level fall of more than 4 m. A fall of less than 2 meters is widespread across the state. A fall of 2 to 4 meters was observed in Kamareddy, Komaram Bheem Asifabad, Adilabad, Nizamabad, Peddapalle, Medak, Sangareddy, Vikarabad, Jangaon, Y Bhuvanagiri, Mahabubnagar, Hannumakonda, Karimnagar, Rajanna Sircilla, J Bhupalpally Nalgonda districts. A fall of more than 4 meters was observed mainly in parts of Nalgonda, Kamareddy, Nizamabad, Karimnagar, Rangareddy, Adilabad, Nirmal, K Asifabad, Hanumakonda, J Bhupalpally, Peddapalle, Sangareddy, Medak, Siddipet, Medchal Malkajgiri, Rajanna Sircilla, Nalgonda, Y Bhuvanagiri, Hyderabad Vikarabad districts.

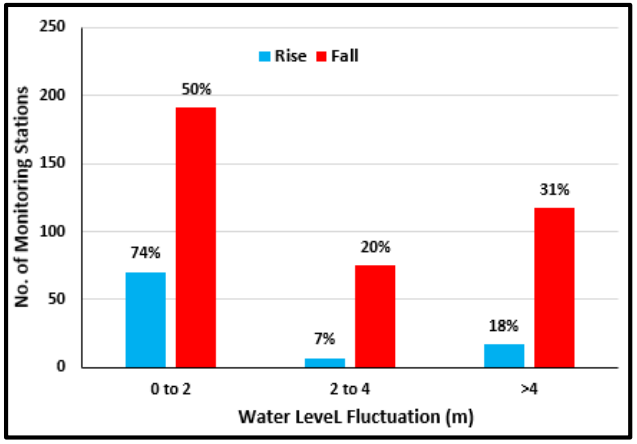

Figure-28: Percentage of wells showing rise and fall in piezometric level in confined/ semi-confined aquifer (January 2023 to January 2025).

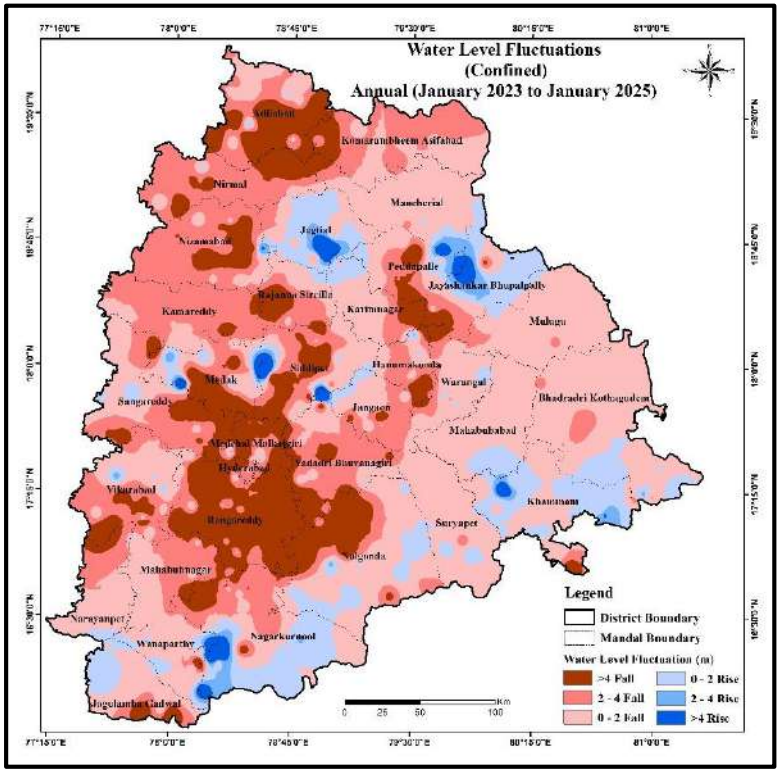

Figure-29: Annual water level fluctuation in piezometric level in confined/ semi-confined aquifer (January 2023 to January 2025)

5.2.4 DECADAL FLUCTUATION IN WATER LEVEL

Decadal Fluctuation of Water Level in Confined/ Semi- Confined Aquifer (Decadal Mean to January 2025)

Analysis of data of 360 wells shows that water level rise is recorded in 26 % wells (94 wells), water level fall is recorded in 74% wells (266 wells).

Rise in Water Levels:

Out of 94 wells, water level rise of less than 2 m is recorded in 45 % wells, 2 to 4 m in 27 % wells and more than 4 m in 29 % of the wells. Water level rise of less than 2 m is seen in Jagtial, Karimnagar, Jangaon, B Kothagudem, Warangal, Sangareddy, Wanaparthy, Nagarkurnool, Mahabubnagar, Mulugu and Medak districts of the State. Water level rise of 2 to 4 m is mainly observed in Jagtial, Rajanna Sircilla, Siddipet Karimnagar, Jangaon, Sangareddy, Wanaparthy, Nagarkurnool, Mahabubnagar, Mulugu and Medak districts. Water level rise of more than 4 m is significantly observed in parts of Siddipet, Jangaon, Sangareddy, Wanaparthy, Nagarkurnool, Mahabubnagar, Nalgonda, Rangareddy, Vikarabad and Medak districts.

Fall in Water Levels:

Out of the 266 wells that have registered fall in water levels, 21 % have recorded less than 2 m while 21 % in the range of 2 to 4 m and remaining 58 % wells registered water level fall of more than 4 m. Fall of less than 2 m is observed mostly in eastern and southern parts and some isolated patches in northern and western parts of the state. Fall of 2 to 4 m is observed in Rajanna Sircilla, Nirmal, Nalgonda, Siddipet, Medak, Kamareddy, Sangareddy, Suryapet, Nalgonda, Vikarabad districts etc. Fall beyond 4 m is observed in Adilabad, K Asifabad, Mancherial, Nirmal, Nizamabad, Kamareddy, Medak, Siddipet, Nalgonda districts etc.

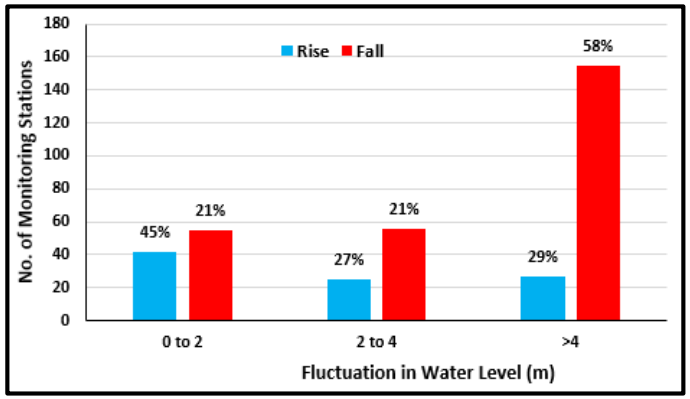

Figure-30: Percentage of wells showing rise and fall in WL in confined Aquifer (Decadal Mean to January 2025)

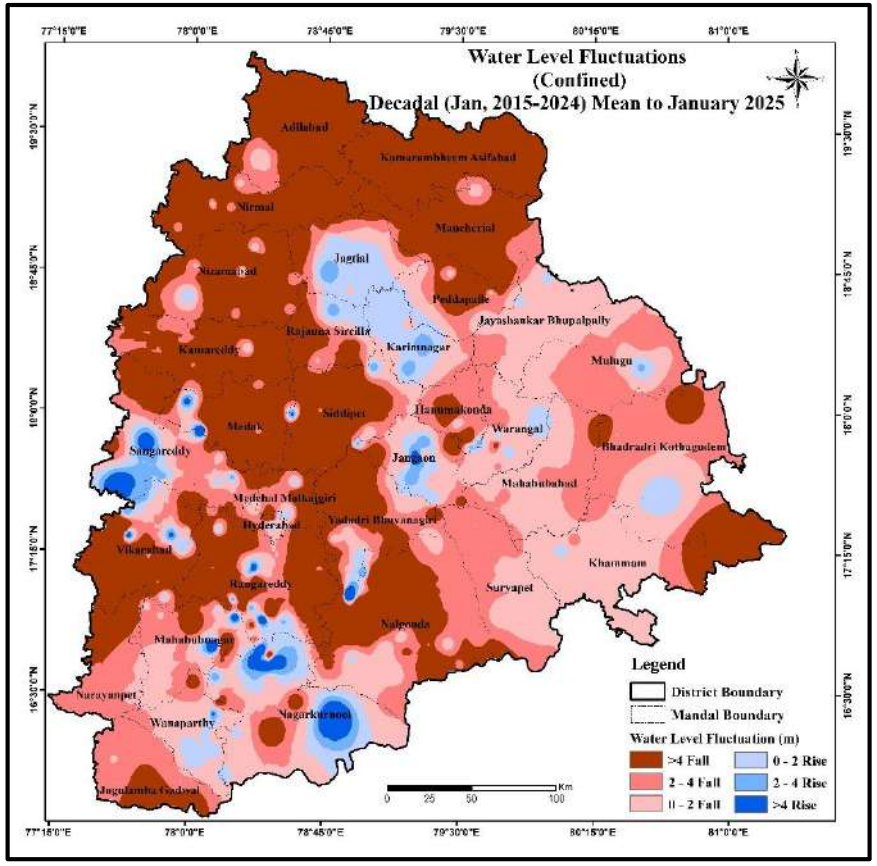

Figure-31: Decadal water level fluctuation in confined Aquifer (Decadal Mean to January 2025)

6.0 SUMMARY

As a component of the National Ground Water Monitoring Programme, the CGWB, SR, Hyderabad 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 December 31, 2024, the Southern Region of the Central Ground Water Board supervises 274 dug wells and 1007 piezometers. This comprehensive report aims to portray the variations in the state's groundwater conditions across different aquifers.

During January 2025, roughly 86% of the state's territory exhibited a water depth of up to 10 meters below the ground level in unconfined aquifers, while 64% of the area showed the same depth in confined and semi confined aquifers. Areas with deeper water levels exceeding 20 meters accounted for 0.6% of the state's territory in unconfined aquifers and 4.9% in confined and semiconfined aquifers, mainly in Rangareddy, Vikarabad, Hyderabad, Medak, Sangareddy, Nizamabad, Nirmal, Adilabad, K. Asifabad, and B. Kothagudem districts.

The groundwater level in Telangana State during January 2025 has been significantly impacted by a notable rise in rainfall from June 2024 to December 2024, resulting in a 11% departure from normal rainfall levels for the same period in the previous year, classifying the region as experiencing excess rainfall. This significant excess in rainfall has further contributed to the rise of groundwater levels in January 2025.

A comparison of the annual water level with the previous year, January 2024 to January 2025, shows that about 65% and 50% of wells in unconfined and confined/semi confined wells respectively experienced a rise in water levels due to the excess rainfall of the 2024 monsoon season. A decline was observed in long-term trends, with 74% of wells showing a fall in piezometric levels over a decade in confined conditions. Whereas, in comparison of January 2023 to 2025, there is significant rise of water levels in both confined and unconfined wells.

7.0 RECOMMENDATIONS

Analysis of groundwater scenario of Telangana state and Andhra Pradesh reveals that the dynamics of groundwater is highly related with the variation in rainfall. Hence the following recommendations are submitted:

- To sustain Monsoon Recharge, efforts must be made to harvest rainwater through check dams, percolation tanks at sites highlighted in Artificial Recharge Master Plan. And also protect and enhance natural recharge zones identified in District Recharge Plan to retain monsoon benefits.
- Promote efficient micro-irrigation techniques like drip and sprinkler irrigation to reduce groundwater extraction and encourage farmers to grow less water-intensive crops in drought-prone regions of Andhra Pradesh. Adopt crop diversification to shift from high-water-consuming crops (paddy, sugarcane) to drought-resistant crops.
- In deep water level zones (>20m), enforce strict regulations on dependency on borewell by implementing incentives for sustainable practices. In Urban areas, dependency on deeper aquifers has to curb by improving surface water supply for domestic use. Promote the reuse of treated water for non-potable purposes to lessen groundwater exploitation.
- Promote afforestation in depleted regions to improve soil moisture retention and groundwater recharge. Select native tree species with deep root systems to enhance percolation and groundwater sustainability.
- Escalate Community Awareness programs to educate farmers and industries on water-efficient practices. Establish community water conservation groups to encourage participatory groundwater management