

GROUND WATER LEVEL BULLETIN

NOVEMBER 2024

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ABSTRACT

Ground water level Scenario during November-2024 highlighting the findings, status of ground water level in different aquifers and its seasonal, annual and decadal comparison.

CGWB, SOUTHERN REGION, HYDERABAD

1. 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, May, November and November. The regime monitoring started in the year 1969 by Central Groundwater Board. A network of 25437 observation wells called **National Hydrograph Network Stations (NHNS)**, as on 30.04.2023, located all over the country is being monitored.

2.0 STUDY AREA

Andhra Pradesh State is the 7th largest state in India covering geographical area of 1,63,000 Km². It lies between NL 12° 37' and 19° 09' and EL 76° 45' and 84° 47'. The State is bordered on the east by Bay of Bengal (coastline length ~970 km), south by Tamil Nadu and Karnataka, west by Karnataka and Telangana and north by Telangana, Chattisgarh and Odisha states. Administratively, the state is divided into 26 districts and governed by 668 revenue mandals with 28123 revenue villages. Total population of the state (2011 census) is ~8.45 crores (with male-female ratio of 993) of which 66.64% lives in rural area and 33.36% in urban area. The average density of population is 308 persons/km². The overall growth in total population during decade is ~9.2 % (2001 to 2011 census).

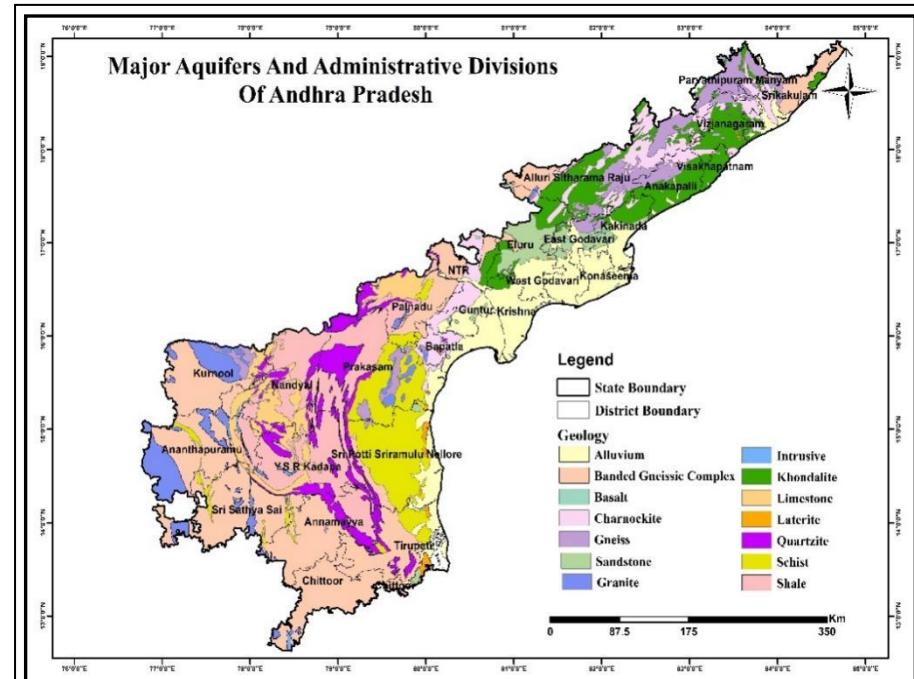


Figure-1: Map showing Major Aquifers and Administrative Divisions of Andhra Pradesh

Physiographically, Andhra Pradesh State can be divided into three distinct zones, viz., Coastal plains, Eastern Ghats and Western pediplains. The first two zones stretch from north-east to south-west in a narrow strip while 3rd zone occupy rest of the area. The elevation ranges from 0 to > 600 m above mean sea level (a.msl). Godavari and Krishna rivers and their tributaries drain the northern and central part while Pennar river drains southern part of state before joining Bay of Bengal. There are 3 major basins and 11 medium river basins in the state.

The state is underlain by diverse rock types of different geological ages from Pre-Cambrian to Recent. 80% of the State is underlain by hard

rock formations like Archaeans, Pre-Cambrians, Cuddapahs, Kurnools and Deccan traps. The remaining 20% is underlain by soft rocks including Gondwanas, Rajahmundry sandstone and Recent Alluvium.

3.0 GROUND WATER LEVEL MONITORING

Central Ground Water Board, Southern Region, is monitoring changes in groundwater regime in Andhra 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 November 2024 was 1473 which include 676 dug wells and 797 piezometers. In November 2024, 1390 wells monitored (1381 water level recorded and 9 wells were dry), while 83 wells (33 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. The number of operational wells after completion of November 2024 monitoring stands at 1473 which include 676 dug wells and 797 Bore wells. The district-wise breakup of the water level monitoring stations is given in **Table-1**.

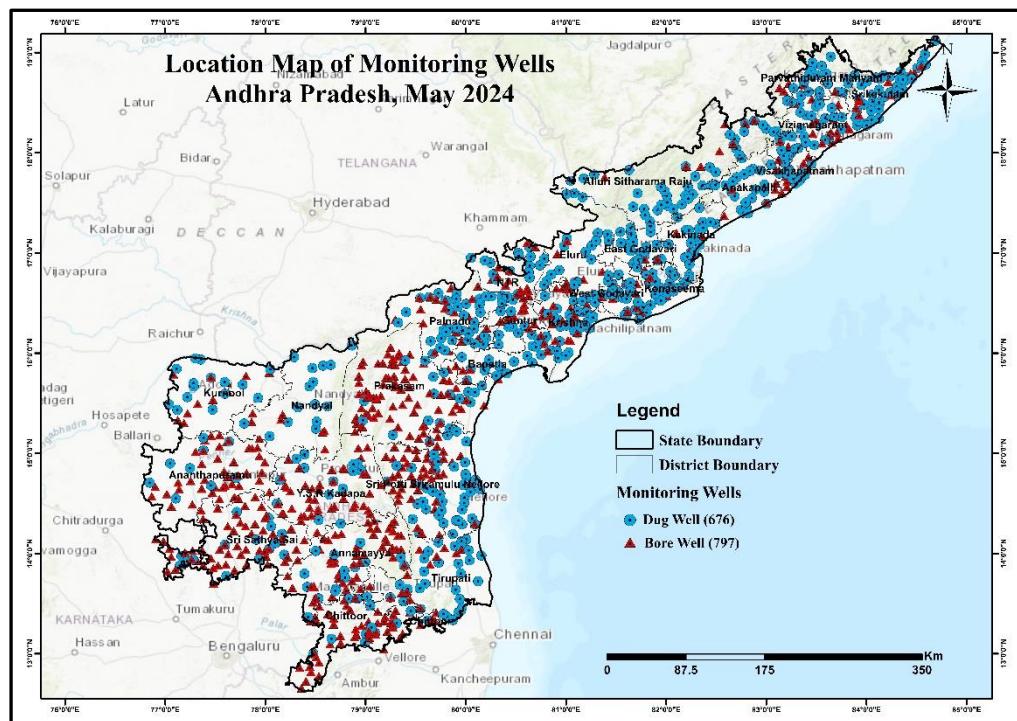


Figure- 2: Map showing locations of monitoring wells (NHNS) in Andhra Pradesh state

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	Alluri Sita Rama Raju	44	56	44	13	57
2	Anakapalli	24	23	24	4	28
3	Ananthapuramu	33	67	8	58	66
4	Annamayya	45	79	19	64	83
5	Bapatla	34	35	24	12	36
6	Chittoor	40	84	15	70	85
7	East Godavari	29	26	30	12	42
8	Eluru	35	51	21	4	25
9	Guntur	24	35	34	21	55
10	Kakinada	31	29	23	18	41
11	Konaseema	31	39	23	7	30
12	Krishna	33	81	29	56	85
13	Kurnool	28	29	17	15	32
14	Nandyal	25	24	22	5	27
15	NTR	25	29	20	19	39
16	Palnadu	55	67	46	28	74
17	Parvathipuram Manyam	32	27	22	6	28
18	Prakasam	88	116	24	98	122
19	Sirkalulam	47	51	45	66	111
20	SPS Nellore	58	128	17	74	91
21	Sri Sathya Sai	45	43	51	29	80
22	Tirupati	35	48	34	16	50
23	Visakhapatnam	14	20	16	16	32
24	Vizianagaram	47	44	31	14	45
25	West Godavari	21	33	22	14	36
26	YSR Kadapa	49	70	15	58	73
	Total	972	1334	676	797	1473

4.0 RAIN FALL

The rainfall data collected and compiled from weekly and monthly weather reports from Andhra Pradesh Water Resources Information and Management System (APWRIMS) were used to analyze the rainfall for the period June 2024 – Oct 2024. Table-2 gives the district-wise rainfall data for the period June-Oct 2023 & 2024, normal and the departure of June-Oct 2023 rainfall with other periods.

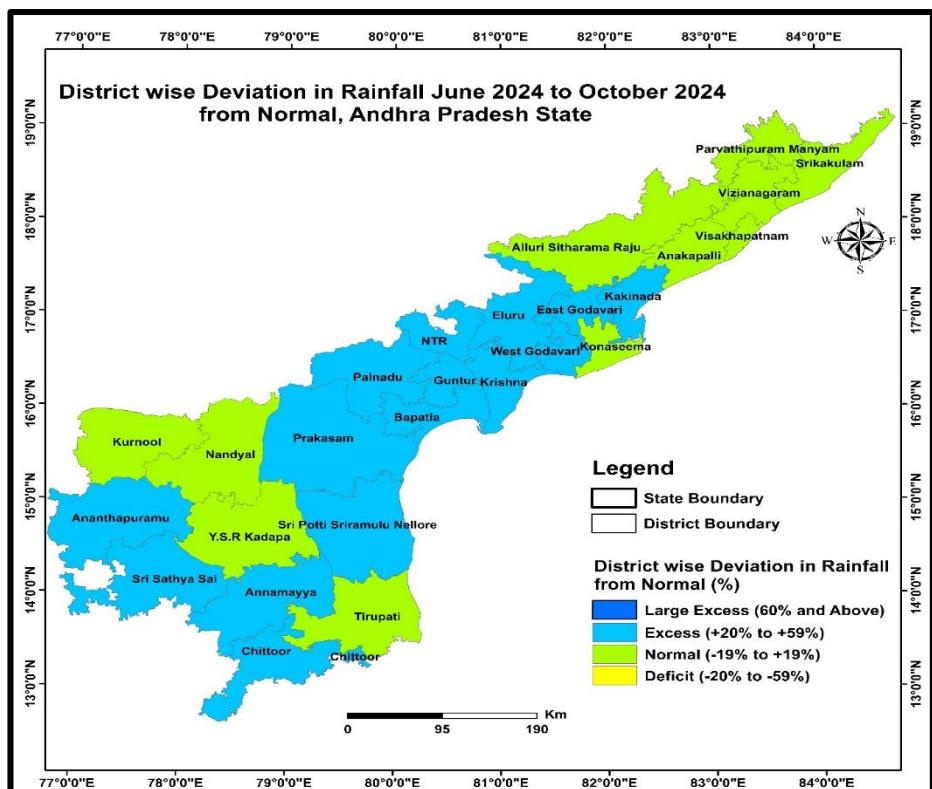


Figure-3: Rainfall deviation (June 2024 – October 2024) from normal rainfall

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

S No	District	Rainfall (June 24-October 24)	Rainfall (June 23 to October 23)	Normal Rainfall	Departure from 2023 (%)	Departure from Normal (%)	Status
1	Alluri Sitharama Raju	1149	856	1053	34%	9%	Normal
2	Anakapalli	1057	607	896	74%	18%	Normal
3	Ananthapuramu	625	311	421	101%	49%	Excess
4	Annamayya	631	354	519	78%	21%	Excess
5	Bapatla	921	698	677	32%	36%	Excess
6	Chittoor	760	582	615	31%	24%	Excess
7	East Godavari	1158	643	945	80%	23%	Excess
8	Eluru	1348	738	900	83%	50%	Excess
9	Guntur	1094	738	702	48%	56%	Excess
10	Kakinada	1062	513	871	107%	22%	Excess
11	Kona Seema	1204	488	1033	147%	17%	Normal
12	Krishna	1127	809	828	39%	36%	Excess
13	Kurnool	603	340	508	77%	19%	Normal
14	Nandyal	727	399	622	82%	17%	Normal
15	NTR	1306	676	888	93%	47%	Excess
16	Palnadu	898	488	604	84%	49%	Excess
17	P.Manyam	958	882	902	9%	6%	Normal
18	Prakasam	709	341	571	108%	24%	Excess
19	SPS Nellore	709	233	570	204%	24%	Excess
20	Sri Sathya Sai	684	325	477	110%	43%	Excess
21	Srikakulam	942	689	889	37%	6%	Normal
22	Tirupati	719	462	618	56%	16%	Normal
23	Visakhapatnam	934	615	828	52%	13%	Normal
24	Vizianagaram	956	735	846	30%	13%	Normal
25	West Godavari	1269	597	997	113%	27%	Excess
26	Y.S.R	615	326	535	89%	15%	Normal
	State Mean	929	556	743	67%	25%	Excess

5.0 GROUND WATER LEVEL SCENARIO (NOVEMBER 2024)

5.1 SHALLOW AQUIFER (UNCONFINED)

5.1.1 DEPTH TO WATER LEVEL

Depth To Water Level in Unconfined Aquifer (November 2024)

Analysis of depth to water level data of 813 wells shows water levels vary between 0.22 m bgl (SPS Nellore district) to 86.3 m bgl (Chittoor district). Water level of less than 2 mbgl is recorded in 33% of wells, between 2 to 5 mbgl in 42% of wells, between 5 to 10 mbgl in 18% of wells, between 10 to 20 mbgl in 4% of wells, between 20-40 m bgl in 2% of wells and water level more than 40 m bgl is registered in 1% of wells. (Figure-4)

Depth to water level map of November, 2024 (Figure-5) for unconfined aquifer shows that shallow water level of less than 2 m bgl as small isolated patches in parts of Bapatla, Guntur, Kakinada, Konaseema, Krishna, Nandyal, Kurnool, West Godavari, Anakapalli, Alluri Sitharama Raju, SPS Nellore, Tirupati, Vishakhapatnam and Vizianagaram districts covering an area of 11% of state. Water level of 2 to 5 m bgl is observed mainly in coastal districts of Andhra Pradesh and also in Alluri Sitharama Raju, Bapatla, Palnadu, Guntur, Eluru, Kurnool, Krishna, Nandyal, Sri Sathya Sai, YSR Kadapa, SPS Nellore, Vizianagaram, Visakhapatnam and small isolated patches over remaining districts covering an area of 55% of the state. Depth to water level of 5 to 10 m bgl is observed significantly in Rayalseema area covering Kurnool, Ananthapuramu, Sri Sathya Sai, SPS Nellore, Chittoor, Prakasam, Nandyal, Tirupati also in Alluri Sitharama Raju, Eluru and West Godavari districts covering 25% of the area of state. Water level of 10 to 20 m bgl is mainly observed in Rayalseema area in YSR Kadapa, Annamayya, Prakasam, Chittoor and Ananthapuramu districts covering 7% area of state. Deeper water levels of more than 20 m occur as isolated pockets covering mainly Prakasam, Sri Sathya Sai, YSR Kadapa, Annamayya, Chittoor, Ananthapuramu and small part of Nandyal districts covering only 2% area of state.

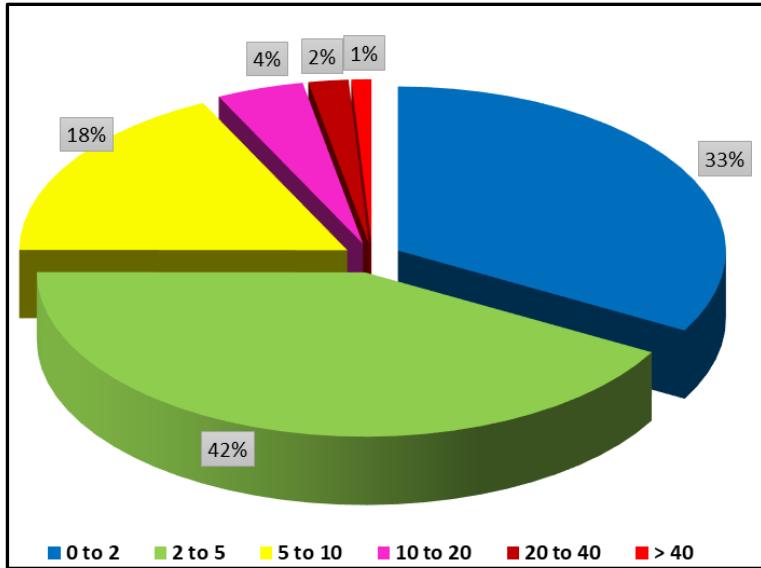


Figure-4: Percentage of wells in different water level ranges in unconfined aquifer.

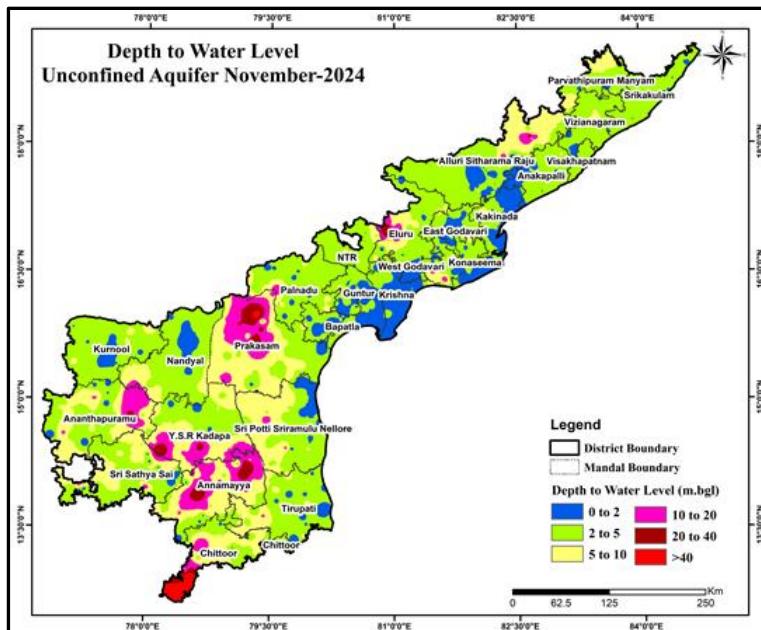


Figure-5: Depth to water level of unconfined aquifer during November 2024.

5.1.2 SEASONAL FLUCTUATION IN WATER LEVEL

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

Rise in Water Levels:

In the State 95% of the area (Figure-7) (699 wells) experienced rise in water levels when compared to the period May 2024. Out of 699 wells, 41% of wells have recorded rise in water level from 0 to 2 m, 37% of wells have recorded 2 to 4 m and 22 % of wells have recorded beyond 4 m. Rise in water level is observed throughout the state except in isolated patches in Prakasam, Ananthapuramu, Annamayya, SPS Nellore, Chittoor, Guntur, Eluru and Alluri Sitharama Raju districts (Figure-6).

Fall in Water Levels:

In the State about 5% of the area (Figure-7) (49 wells) experienced fall in water levels when compared to May 2024. Out of 49 wells that have registered fall in water levels, 59% of wells have recorded less than 2m fall, 12% of wells recorded fall of 2 to 4m, and 29% of wells recorded fall beyond 4m. The fall in water level is observed only in isolated patches of the district in Prakasam, Ananthapuramu, Annamayya, SPS Nellore, Chittoor, Guntur, Eluru and Alluri Sitharama Raju districts (Figure-6).

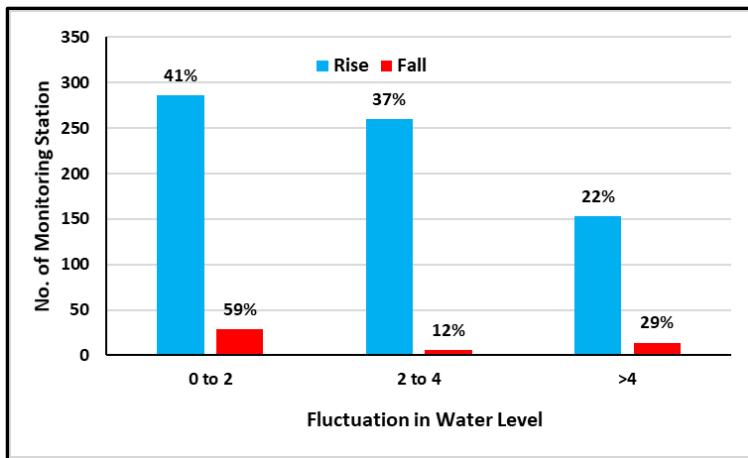


Figure-6: Percentage of wells showing seasonal rise and fall in WL in unconfined aquifer (May 2024 to November 2024)

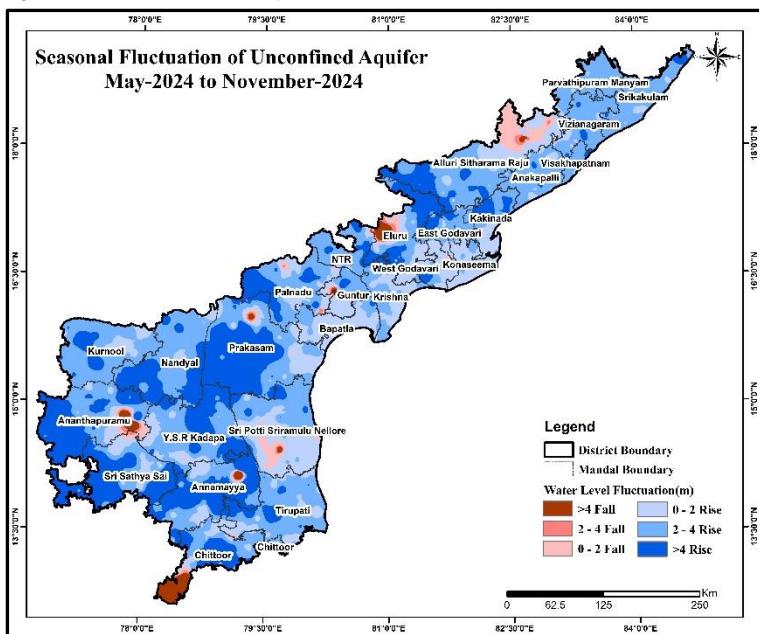


Figure-7: Seasonal water level fluctuation in unconfined Aquifer(May 2024 to November 2024)

5.1.3 ANNUAL FLUCTUATION IN WATER LEVEL

Annual Fluctuation of Water Level in Unconfined Aquifer (November 2023 to November 2024)

Rise in Water Levels:

In the State 84% of the area (Figure-9) (631 wells) experienced rise in water levels when compared to November 2023. Out of 631 wells, 20% of wells have recorded rise in water level from 2 to 4 m and is observed as patches over Prakasam, Nandyal, Kurnool, Palnadu, Sri Sathya Sai, SPS Nellore, Tirupati and Kakinada districts covering an area of 22%. Water level rise of less than 2m is observed in 69% wells covering 54% of the area and is mainly observed through out the districts. Water level rise of more than 4m is observed in only 11% of wells covering an area of 9% and is mainly observed in Sri Sathya Sai Prakasam, Palnadu, SPS Nellore and Ananthpuramu districts (Figure-8).

Fall in Water Levels:

Out of the 135 wells that have registered fall in water levels (Figure-9), 63% have recorded less than 2 m while 21% in the range of 2 to 4 m and remaining 16% wells registered water level fall of more than 4 m. Fall of less than 2 m is observed in parts of districts of Chittoor, Annamayya, YSR Kadapa, Ananthpuramu, Eluru, Alluri Sitharama Raju, Srikakulam, Parvathipuram Manyam and Konaseema districts covering area of 10%. Fall of 2 to 4 m, recorded in Chittoor, Annamayya, YSR Kadapa, Ananthpuramu, Eluru, Alluri Sitharama Raju, Srikakulam, Parvathipuram Manyam and Konaseema districts covering an area of 3%. Fall beyond 4 m is recorded mainly in Ananthapuramu along with YSR Kadapa, Annamayya, Chittoor, Sri Sathya Sai, Eluru and Alluri Sitharama Raju districts covering an area of 3% of the state(Figure-8).

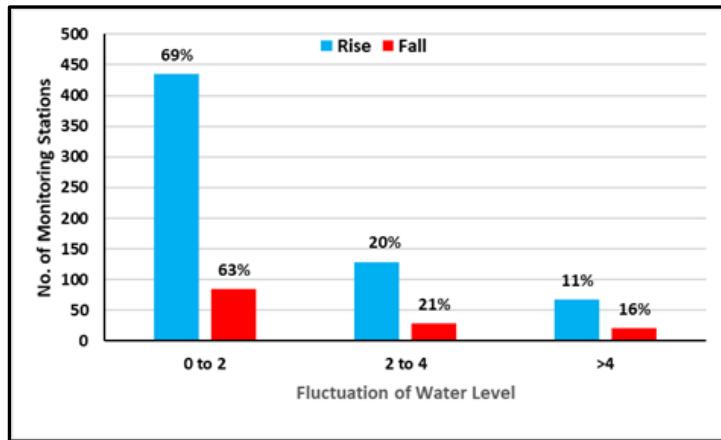


Figure-8: Percentage of wells showing annual rise and fall in WL in unconfined aquifer(November 2023 to November 2024)

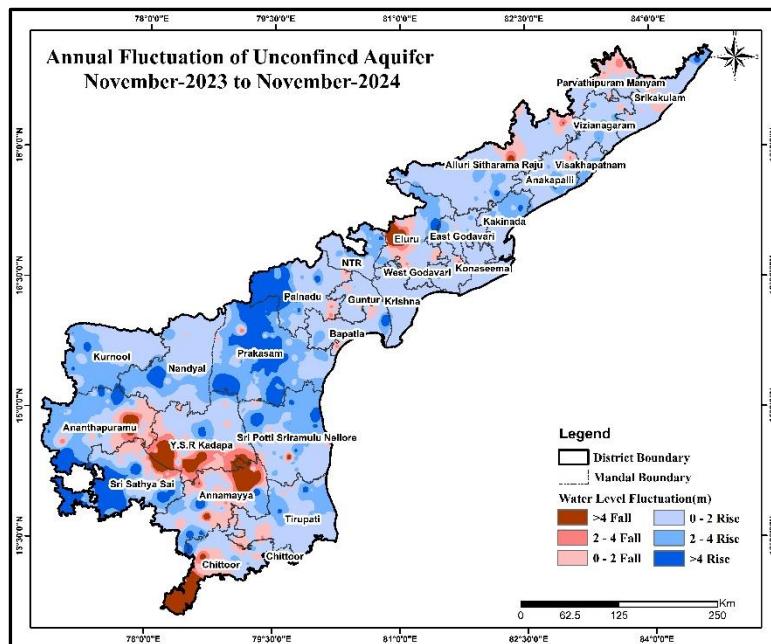


Figure-9: Annual water level fluctuation in unconfined Aquifer November 2023 to November 2024

5.1.4 DECADAL FLUCTUATION IN WATER LEVEL

Decadal Fluctuation of Water Level in Unconfined Aquifer (Decadal Mean November (2014-2023) to November 2024)

Rise in Water Levels:

In the State, 63% of the area (Figure-11) (435 wells) experienced rise in water levels when compared to the November decadal mean (2014-2023). Out of 435 wells, 16% of wells have recorded rise in water level from 2 to 4 m and is observed as patches over Prakasam, Nandyal, Palnadu, YSR Kadapa, Sri Sathya Sai and Annamayya districts covering insignificant areas (11%). Water level rise of less than 2m is observed in 73% wells covering 47% of the area with majorly observed over the Kurnool, Nandyal, Ananthpuramu, Sri Sathya Sai, SPS Nellore, Tirupati, Prakasam, Palnadu, Anakapalli and small isolated patches over remaining districts. Water level rise of more than 4m is observed in only 10% of wells covering an area of 5% mainly observed in Praksham, Palnadu, Sri Sathya Sai and Annamayya districts majorly (Figure-10).

Fall in Water Levels:

Out of the 360 wells that have registered fall in water levels (Figure-11), 79% have recorded less than 2 m while 12% in the range of 2 to 4 m and remaining 9% wells registered water level fall of more than 4 m. Fall of less than 2 m is observed in all districts mainly in parts of Parvathipuram Manyam, Srikakulam, Vizianagaram, Vishakhapatnam, Anakapalli, Alluri Sitha Rama Raju, Ananthpuramu, Sri Sathya Sai, Annamaya, Eluru, Konaseema, West Godavari, Krishna and Guntur districts. Fall of 2 to 4 m, recorded in Alluri Sitharam Raju, Ananthpuramu, Eluru, Chittoor, YSR Kadapa, Annamayya and Konaseema districts. Fall beyond 4 m is recorded mainly in Ananthapuramu, Alluri Sitharam Raju, Konaseema, YSR Kadapa, Chittoor and Eluru districts (Figure-10).

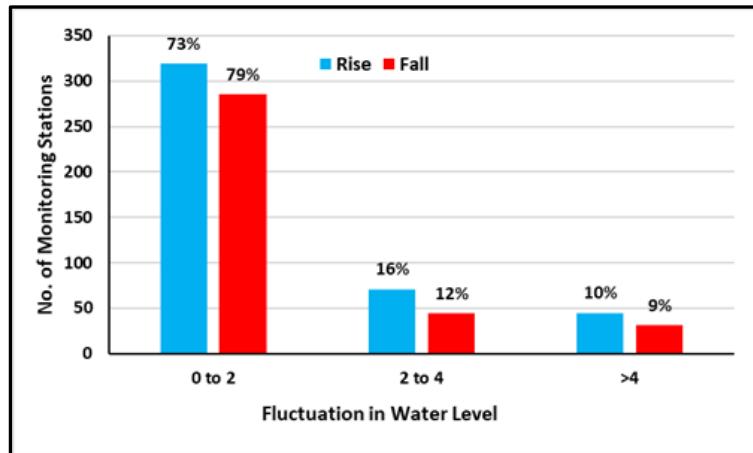


Figure-10: Percentage of wells showing decadal rise and fall in WL in unconfined Aquifer (Decadal Mean November (2014-2023) to November 2024)

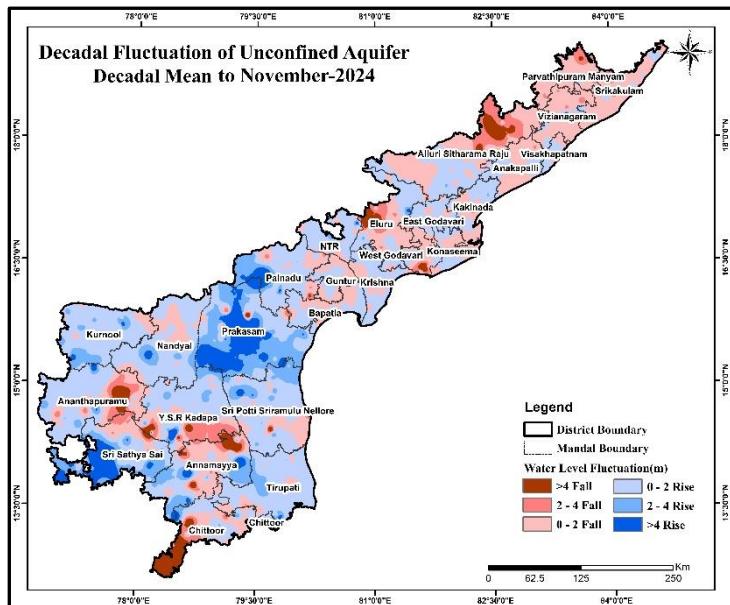


Figure-11: Decadal water level fluctuation in unconfined Aquifer (Decadal Mean November (2014-2023) to November 2024)

5.2 DEEPER AQUIFER (CONFINED/ SEMI-CONFINED)

5.2.1 DEPTH TO PIEZOMETRIC LEVEL

Depth To Piezometric Level in Confined/Semi-Confined Aquifer (Nov 2024)

Analysis of piezometric head data of 551 wells shows water levels vary between 0.1 m.bgl (Bapatla) to 90.07 bgl (Annamayya). Water level of less than 2 m bgl is recorded in 11% of wells, between 2 to 5 m bgl in 23% of wells, between 5 to 10 m bgl in 31% of wells, between 10 to 20 m bgl in 22 % of wells, between 20-40 m bgl in 10% of wells and water level more than 40 m bgl is registered in 2 % of wells (Figure-12).

Piezometric head map of November 2024 (Figure-13) shows that shallow water level of less than 2 m bgl is noticed in isolated patches in Kurnool, Ananthpuramu, Prakasam, Palnadu, Anakapalli and Srikakulam districts covering an area of 1% of the State. Water level of 2 to 5 m bgl observed in Srikakulam, Vizianagaram, Anakapalli, Guntur, NTR, Palnadu, Bapatla, Prakasam, Tirupati, Kurnool and Ananthpuramu districts covering an area of 19% of the State. 46 % area of the State is covered by depth to water level of 5 to 10 m bgl through out the state with significant area in Sri Sathya Sai, Kurnool, Ananthpuramu, Chittoor, Tirupati, SPS Nellore, YSR Kadapa, Alluri Sitharama Raju, Palnadu, Eluru and East Godavari districts. Water level of 10 to 20 m bgl is covered in 26% of the State area and is mainly observed in Prakasam, Chittoor, Sri Sathya Sai, YSR Kadapa, Nandyal, Annamayya, East & West Godavari, Konaseema, Krishna, Eluru and Alluri Sitharama Raju districts. Deeper water levels of more than 20 m covers 7% area of the State and mainly observed in Prakasam, Palnadu, Annamayya, Chittoor, Nandyal, YSR Kadapa and Alluri Sitharama Raju districts.

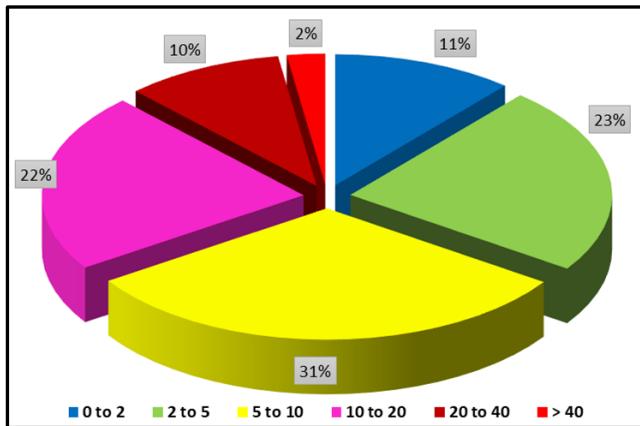


Figure-12: Percentage of wells in different piezometric levels (November 2024)

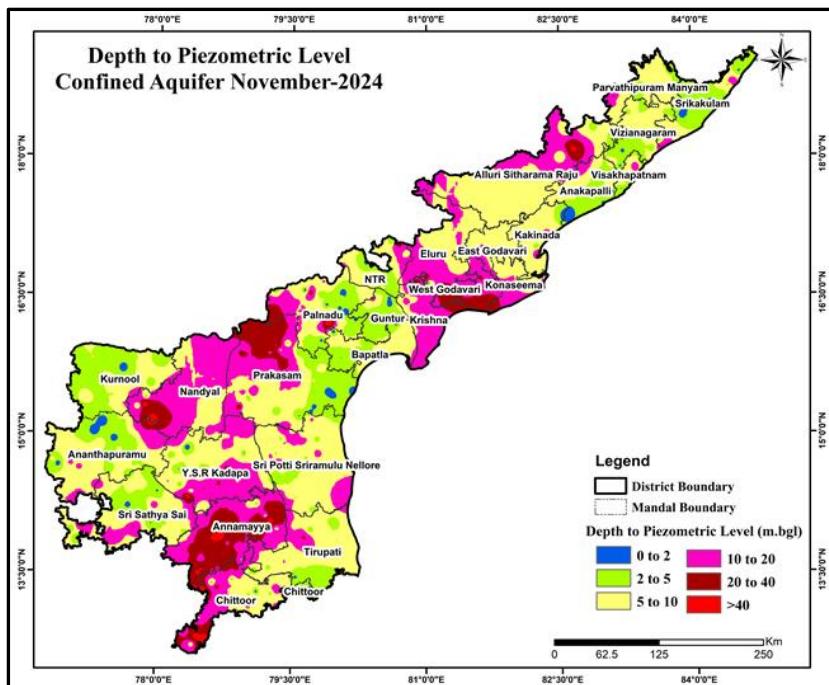


Figure-13: Depth to piezometric Level in deeper aquifer in November 2024.

5.2.2 SEASONAL FLUCTUATION IN PIEZOMETRIC LEVEL

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

Rise in piezometric levels:

Out of 480 wells, piezometric level rise of less than 2m is recorded in 23% wells (Figure-14) covering an area of 12%, 2 to 4m in 30% wells and more than 4 m in 48% of the wells spread over 34% and 50% of the state area respectively. Piezometric level rise of less than 2m is seen mainly in Alluri Sitharama Raju, Konaseema, West Godavari, Krishna, Palnadu, SPS Nellore and Tirupati districts. Piezometric level rise of 2 to 4 m is observed mainly in Parvathipuram maniyam, Srikakulam, Vizianagaram, Vishakhapatnam, Anakpalli, Alluri Sitharama Raju, NTR, Kurnool, Ananthapuramu, Guntur, SPS Nellore and Tirupati districts. Rise of more than 4m is observed throughout the state significantly in Eluru, Alluri Sitharama Raju, Srikakulam, Nandyal, Kurnool, YSR Kadapa, Annamayya, Sri Sathya Sai, Ananthapuramu, Chittoor, Praksham, Bapatla, Vishakhapatnam, Vizianagaram Anakapalli districts (Figure-15).

Fall in Piezometric Levels:

Only 45 wells have registered fall in piezometric levels, out of this 42% have recorded less than 2 m (Figure-14) covering an area of 2% while 20% in the range of 2 to 4 m and remaining 38% wells registered piezometric level fall of more than 4 m covering area 1% each respectively. Fall of less than 2 m is mainly observed as patches in Alluri Sitharama Raju, Konaseema, West Godavari, Palnadu, Annamayya, Anathpuramu, Chittoor and SPS Nellore districts. Fall of 2 to 4 m is observed majorly in SPS Nellore, Annamayya, Chittoor, Palnadu, Alluri Sitharama Raju, West Godavari, Konaseema and Prakasam. Fall of beyond 4 m is observed as asisolated patches in Alluri Sitharama Raju, Konaseema, West Godavari, Palnadu, Annamayya and Prakasam districts. (Figure-15).

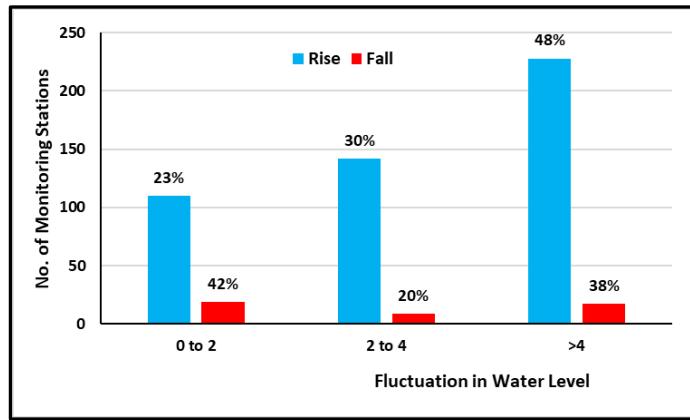


Figure-14: Percentage of wells showing seasonal rise and fall in WL in confined/semi-confined aquifer (May 2024 to November 2024)

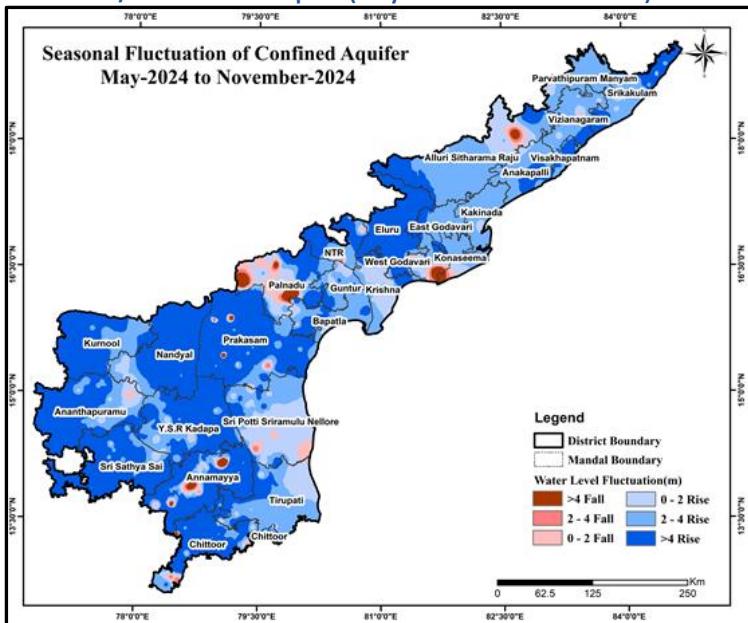


Figure-15: Seasonal water level fluctuation in confined/semi-confined Aquifer May 2024 to November 2024

5.2.3 ANNUAL FLUCTUATION IN PIEZOMETRIC LEVEL

Annual Fluctuation of Piezometric Level in Confined /Semi-confined Aquifer (November 2023 to November 2024)

Rise in piezometric levels:

Out of 348 wells, piezometric level rise of less than 2 m is recorded in 47% wells (Figure-16) covering 42% of the area, 2 to 4m in 25% wells and more than 4m in 28% of the wells covering 19% and 14% of the area, respectively. Piezometric level rise of less than 2m is seen in throughout the state, majorly in Alluri Sitharama Raju, Parvathipuram Manyam, Srikakulam, Vishakhapatnam, Vizianagram, Kakinada, Anakapalli, Konaseema, Eluru, NTR, East&West Godavari, Palnadu, SPS Nellore, Chittoor, Kurnool, Tirupati and Sri Sathya Sai districts. Piezometric level rise of 2 to 4m is observed mainly in Alluri Sitharama Raju, Eluru, Palnadu, Prakasam, Nandyal, Kurnool, Chittoor, Ananthapuramu and Sri Sathya Sai districts. Rise of more than 4m is significantly observed in Prakasam, Palnadu, Nandyal, Sri Sathya Sai, Ananthpuram, Chittoor and Alluri Sitharama Raju districts (Figure-17).

Fall in Piezometric Levels:

Out of 148 wells that have registered fall in piezometric levels, 45% have recorded less than 2m covering (Figure-16) 15% of the area. 14% in the range of 2 to 4 m and remaining 41% wells registered piezometric level fall of more than 4 m spread over an area of 4% and 6%, respectively. Fall of less than 2m is mainly observed majorly in the Srikakulam, Parvathipuram Manyam, Bapatla, Guntur, West Godavari, Krishna, NTR, Ananthapuramu, YSR Kadapa, Annamayya, Tirupati, Palnadu, Alluri Sitharama Raju and NTR. Fall of 2 to 4 m is observed mainly in Parvathipuram Manyam, West Godavari, Krishna, Palnadu, NTR, Ananthapuramu, Tirupati, YSR Kadapa Annamayya and Alluri Sitha Rama Raju districts. Fall of beyond 4 m is observed over the Alluri Sitharama Raju, West Godavari, Krishna, Guntur, Palnadu, Guntur, Bapatla, YSR Kadapa, Annamayya, and Chittoor districts (Figure-17).

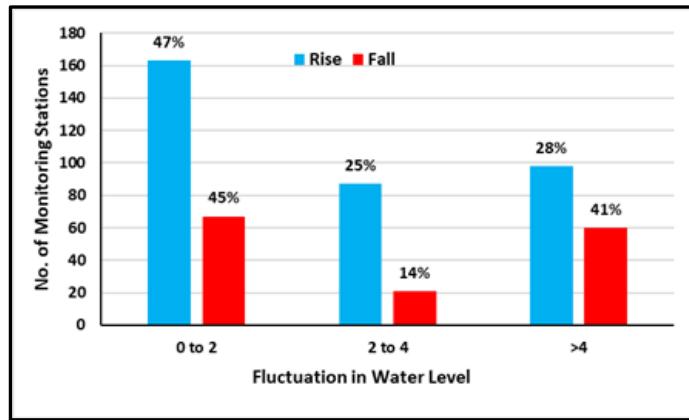


Figure-16: Percentage of wells showing seasonal rise and fall in WL in confined/semi-confined aquifer(November 2023 to November 2024)

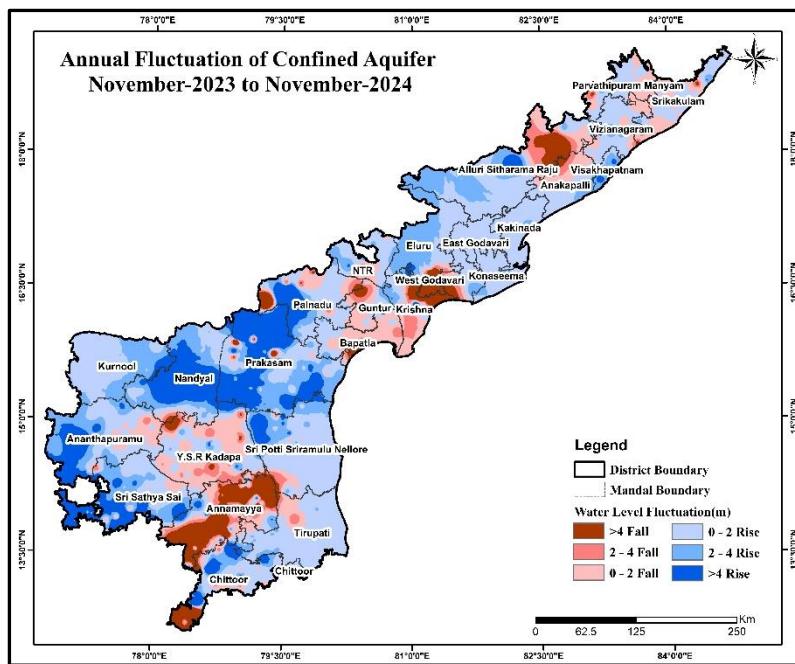


Figure-17: Annual water level fluctuation in confined/semi-confined Aquifer
(November 2023 to November 2024)

5.2.4 DECADAL FLUCTUATION IN PIEZOMETRIC LEVEL

Decadal Fluctuation of Piezometric Level in Confined / Semi-confined Aquifer (Decadal Mean November (2013-2024) to November 2024)

Rise in piezometric levels:

Out of 327 wells, piezometric level rise of less than 2 m is recorded in 48% wells covering an area of 39%, 2 to 4m in 24% wells and more than 4 m in 28% of the wells are spread over 11% and 9% of the area, respectively (Fig. 18). Piezometric level rise of less than 2m is seen in major parts of State mainly in Srikakulam, Alluri Sitharama Raju, Vizianagram, Vishakhapatnam, Konaseema, Eluru, NTR, Krishna, Guntur, Palnadu, Prakasam, Nandyal, Kurnool, Ananthpuramu, Sri Sathya Sai, SPS Nellore, Tirupati and Chittoor districts (Fig. 19). Piezometric level rise of 2 to 4 m is observed mainly in Alluri Sitharama Raju, Palnadu, Eluru, Prakasam, Palnadu, Kurnool, Nandyal, Anathpuramu, YSR Kadapa, SPS Nellore and Tirupati, Ea districts. Rise of more than 4m is significantly observed in Alluri Sitharama Raju, Eluru, Palnadu, Prakasam, Nandyal, Sri Sathya Sai, Ananthapuramu and SPS Nellore, districts.

Fall in piezometric level:

Out of 186 wells that have registered fall in piezometric levels, 51% have recorded less than 2 m covering over an area of 26% while 15% in the range of 2 to 4 m and remaining 35% wells registered piezometric level fall of more than 4 m with spread over an area of 6% and 8%, respectively. Fall of less than 2 m is mainly observed majorly in the Srikakulam, Parvathipuram Manyam, Vizianagram, Anakapalli, Kakinada, Konaseema, East & West Godavari, Krishna, Bapatla, YSR Kadapa, Prakasam, Nandyal, Ananthapuramu, Sri Sathya Sai, Palnadu and Annamayya districts. Fall of 2 to 4 m is observed majorly in Alluri Sitharama Raju, Anakapalli, Kakinada, East& West Godavari, Guntur, Palnadu, Bapatla, Prakasam, Nandyal, YSR Kadapa, Chittoor and Annamayya districts. Fall of beyond 4 m is observed majorly over Alluri Sitharama Raju, Anakapalli, Kakinada, East& West Godavari, Guntur, Palnadu, Bapatla, Prakasam, Nandyal, YSR Kadapa, Chittoor and Annamayya districts

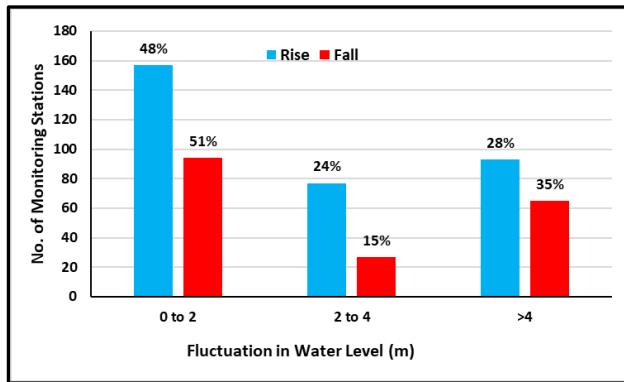


Figure-18: Percentage of wells showing decadal rise and fall in piezometric level in confined/semi-confined Aquifer (Decadal Mean November (2013-2024) to November 2024)

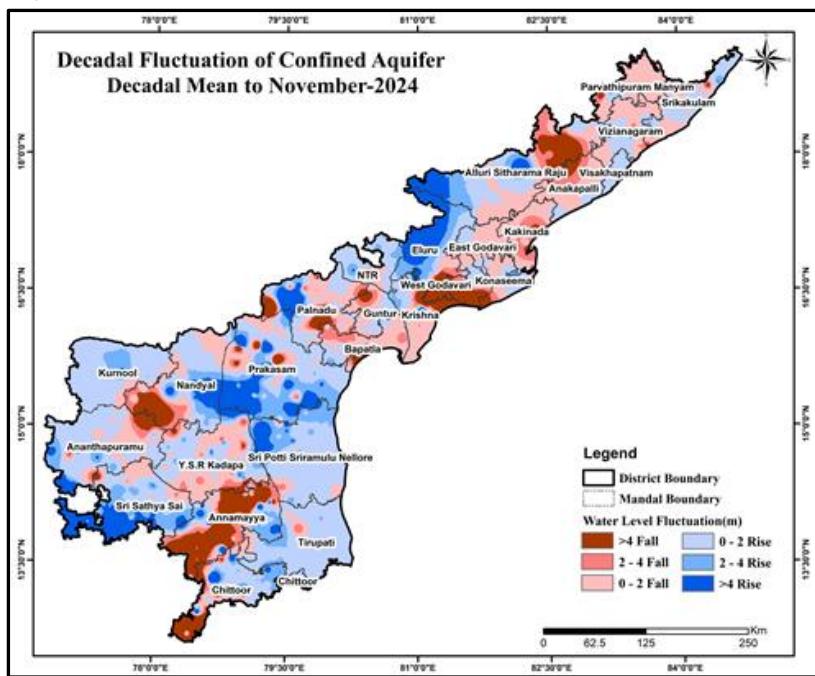


Figure-19: Decadal water level fluctuation in confined Aquifer (Decadal Mean November (2014-2023) to November 2024)

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, post-monsoon August, and November. Additionally, a yearly assessment of ground water quality is performed in May. As of November 30, 2024, the Andhra Pradesh State Unit Office of the Central Ground Water Board monitors 676 dug wells and 797 piezometers. This comprehensive effort aims to portray the variations in the state's groundwater conditions across different aquifers.

In November 2024, in unconfined aquifer around 91% of the state's area and in confined aquifer around 67% exhibited a depth to water level within 10 meters below ground level. Deeper water levels of more than 20 m covers 2% area of the State in unconfined aquifers and 7% area in confined aquifer mainly covering mainly Prakasam, YSR Kadapa, Annamayya, Chittoor, Ananthapuramu, Nandyal, West Godavari, Alluri Sitharama Raju and Eluru districts.

The groundwater level in Andhra Pradesh during November 2024 has been significantly influenced by a notable normal rainfall from June 2024 to October 2024. This period witnessed a departure of 25% from the normal and 67% when compared to June 2023 to October 2023, classifying the region as experiencing large excess rainfall in comparison to June 2023 to October 2023. This significant rainfall has led to the further improvement of ground water during – November 2024.

Seasonal water level fluctuation, May-2024 to November-2024 in unconfined aquifer shows that about 93% of wells (699) has shown rise in water level and 7% of wells (49) showed fall in water level. For confined/semi-confined aquifer system about 91% of wells (480) shows rise in water level and 8% of wells (45) showed fall in water level. The significant rise in water levels 93% of wells in unconfined and 91% of wells in confined aquifer is influenced by the rainfall condition during June 2024 to October 2024

Annual water level fluctuation, November-2023 to November-2024 in unconfined aquifer shows that about 82% of wells (631) has shown rise in water level and 15% of wells (135) showed fall in water level. For confined/semi-confined aquifer system about 70% of wells (348) shows rise in water level and 30% of wells (148) showed fall in water level. The significant increase in water levels 82% of wells in unconfined and 70% of wells in confined aquifer might be influenced by the large excess (67%) rainfall condition during June 2024 to October 2024 compared to June 2023 to October 2023.

The Decadal fluctuation (November 2014-2023 to November 2024) of ground Water Level in unconfined aquifer shows 63% of the area experienced rise in water levels when compared to the decadal November (post-monsoon) mean. Out of 795 wells, 16% of wells have recorded rise in water level from 2 to 4 m. Water level rise less than 2m is observed in 73%. Water level rise of more than 4m is observed in only 11% of wells.

The decadal fluctuation (November 2014-2023 to November 2024) in confined/semi-confined it is observed that level rise of less than 2 m is recorded in 48% wells, 2 to 4m in 24% wells and more than 4 m in 28% of the wells.