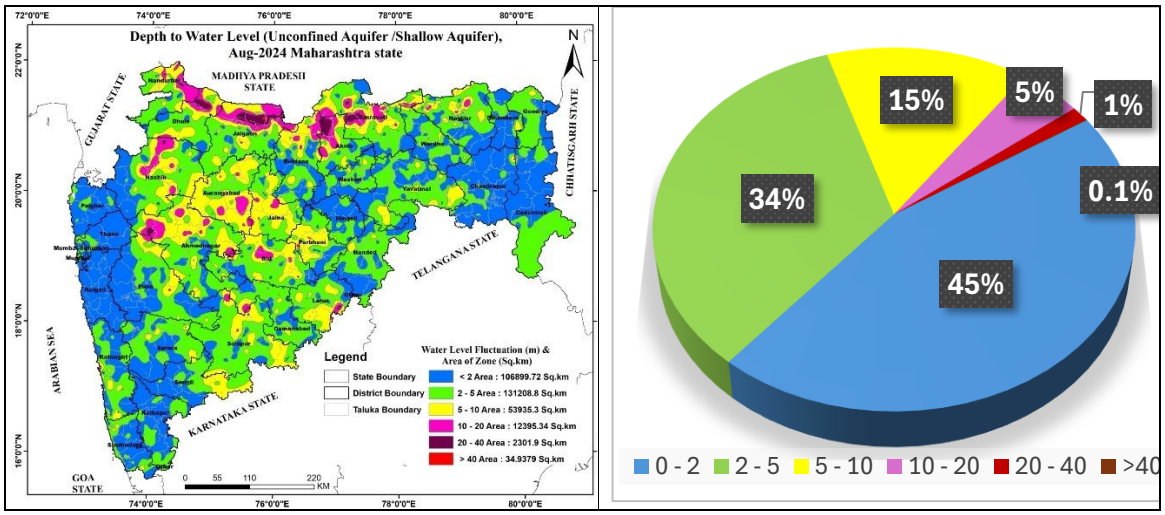
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION



GROUND WATER LEVEL BULLETIN

August- 2024

Maharashtra

ABSTRACT

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

CENTRAL GROUND WATER BOARD
CENTRAL REGION, NAGPUR

1. INTRODUCTION

Since 1969, Central Ground Water Board (CGWB) monitors ground water levels all over the country four times a year during January, May, August and November. A Groundwater bulletin has been 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 natural conditions affecting the groundwater regime involve climatic parameters like rainfall, evapotranspiration etc., whereas anthropogenic influences include pumping from the aquifer, recharge due to irrigation systems and other practices like waste disposal etc. This continuous monitoring provides a valuable tool to decipher the seasonal and long-term changes in ground water levels, and in turn helps in managing the ground water resources in a more scientific and effective manner.

2. STUDY AREA

The State of Maharashtra occupies the west-central part of India. It lies between latitudes 15°45': 22°00' N and longitudes 73°0': 80°59' E **(Fig.1).** Maharashtra, the third largest state in India has a total geographical area of 3, 07,713 sq km with 9.4 % of the country area. It is bound on the north by Gujarat, north-east and east by Madhya Pradesh, south-east and south by Telangana, south-west by Karnataka and Goa and in the west by the Arabian Sea. Administratively, the state is governed by 36 districts which are grouped into six divisions namely Konkan, Pune, Nashik, Chatrapati Sambhaji Nagar (Aurangabad), Amravati and Nagpur. The State is further divided into five regions namely Konkan, Western Maharashtra, Khandesh, Marathwada and Vidarbha. Total population of the State is 112.37 million out of which 50.81 million (45.21%) is urban and 61.56 million (54.78%) is rural. The average density of population is 365 persons/km^2. The overall growth in total population during decade is ~15.99 % (2001 to 2011 census).

Central Ground Water Board, Central Region, Nagpur has set up a network of 2105 observation wells known as the Ground Water Monitoring Wells (GWMW's) located all over Maharashtra which comprises of 1808 dug wells and 297 piezometers. The average density of Monitoring stations is 147 Km^2/well.

Physiographically, the state can be divided into 3 units namely Sahyadri Range (Western Ghats), the Western Coastal Tract (Konkan), and the Eastern Plateau (Deccan Plateau). Godavari, Krishna, Tapi, Mahanadi, Narmada and Coastal Basins are the Major River basins in the State. About 75% area of Maharashtra is drained by eastward flowing rivers, viz., the Godavari and Krishna draining into the Bay of Bengal, the remaining 25% of the area is drained by westward flowing rivers, viz., Tapi and Konkan

coastal rivers, draining into the Arabian Sea. 45% of state's water resources are from West Flowing Rivers which are mainly monsoon specific rivers emanating from the Ghats and draining into the Arabian Sea. ~53 % of network stations fall in Godavari basin, 16 % fall in Tapi, 16% fall in Krishna, and 15 % network stations fall in the Coastal basins.

~82 % area of the Maharashtra State (2,49,934 sq km) is covered by Deccan trap basalts, whereas rest of area is covered by Quaternary alluvium (14,526 sq km; 4.7 %), Gondwanas (4800 sq km; 1.6 %), Precambrian (Vindhyans, Cuddapahs, and Kaladgi group of rocks - 6,217 sq km; 2%) and Archaean's (32,235 sq km; 10.5%). The aquifers are grouped under three major hydrogeological groups namely unconsolidated, semi-consolidated and consolidated and nine different types of hydrogeological sub-groups based on geological age and hydrogeological characters.

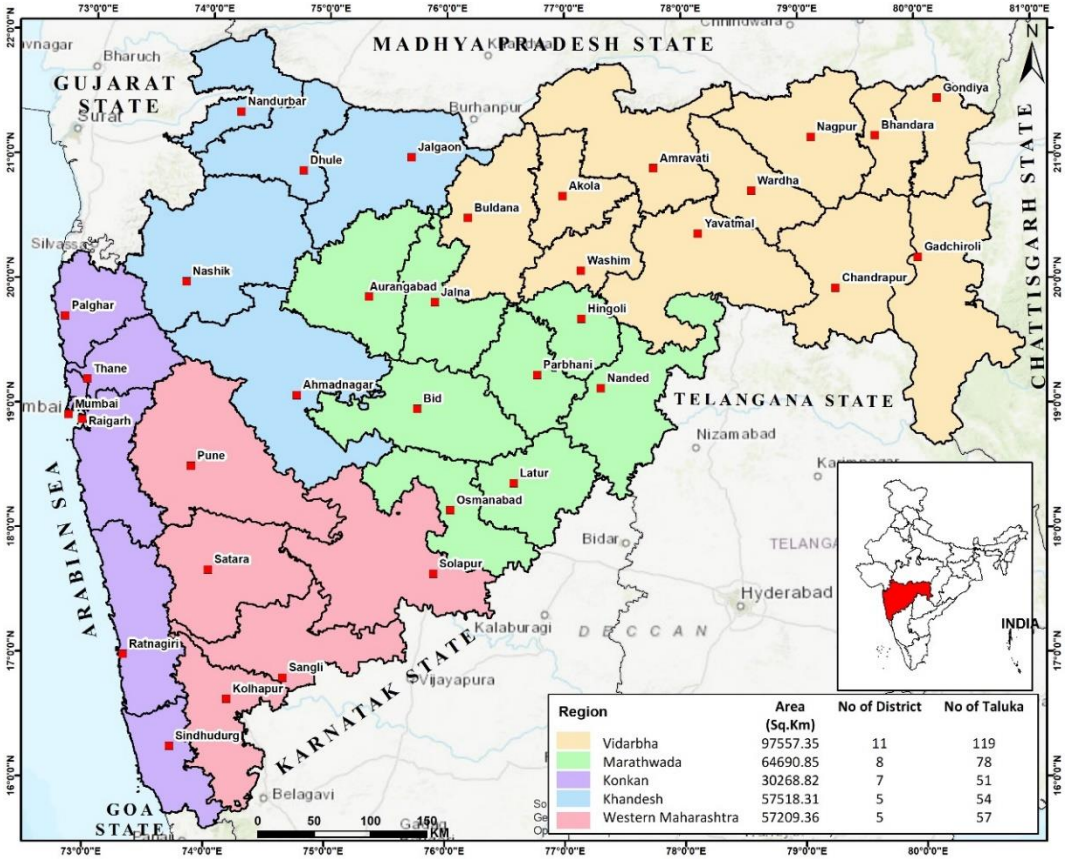


Fig. 1: Location & administrative division, Maharashtra state.

3.0 GROUND WATER MONITOIRNG

Central Ground Water Board, Central Region, monitors ground water levels four times in a hydrological year (August, November, January and November) through a network of 2105 Ground Water Monitoring Wells (GWMW) (DW: 1808 & Pz: 297) spread all over the State **Fig. 2.** The long-term data generated during monitoring is essential for computation, evaluation and analysis of ground water utilization and its availability.

During the month of August-2024, 2035 GWMWs (DW: 1756; PZs: 279) were monitored over entire Maharashtra. However, 70 GWMW could not be monitored due to various unavoidable reasons like inaccessibility, lock jam, outside water added, well filled up, well fitted with pump etc. The district wise status of GWMWs for the month of August 2024 is presented in **Table 1** and location of GWMWs is shown in **Fig. 2**.

Table 1: The district wise status of GWMWs for the month of August 2024

S. No.	District	Active		Dry		Wells Not Monitored		Total No of wells		
		DW	BW	DW	BW	DW	BW	DW	BW	Total well
1	Ahmednagar	76	9	1	0	3	2	80	11	91
2	Akola	24	6	1	0	1	0	26	6	32
3	Amravati	81	10	2	0	8	4	91	14	105
4	C. Sambhaji Nagar (Aurangabad)	50	3		0	2	0	52	3	55
5	Beed	64	1	0	0	1	0	65	1	66
6	Bhandara	30	2	0	0	3	2	33	4	37
7	Buldana	71	53	0	0	3	0	74	53	127
8	Chandrapur	61	12	0	0	5	0	66	12	78
9	Dhule	36	6	1	0	0	0	37	6	43
10	Gadchiroli	42	4	0	0	1	0	43	4	47
11	Gondia	19	7	0	0	0	1	19	8	27
12	Hingoli	48	7	0	0	2	1	50	8	58
13	Jalgaon	61	5	0	0	1	0	62	5	67
14	Jalna	48	6	0	0	1	0	49	6	55
15	Kolhapur	40	3	0	0	0	1	40	4	44
16	Latur	39	7	0	0	4	0	43	7	50
17	Mumbai City	6	0	0	0	0	0	6	0	6
18	Mumbai Suburban	19	0	0	0	0	0	19	0	19
19	Nagpur	79	18	0	0	0	2	79	20	99
20	Nanded	56	1	0	0	0	1	56	2	58
21	Nandurbar	22	4	0	0	0	0	22	4	26
22	Nashik	69	6	1	0	0	1	70	7	77
23	Dharashiv (Osmanabad)	37	3	0	0	2	0	39	3	42
24	Palghar	39	1	0	0	3	0	42	1	43
25	Parbhani	47	3	0	0	0	0	47	3	50
26	Pune	65	3	0	0	1	0	66	3	69
27	Raigad	49	1	0	0	1	0	50	1	51
28	Ratnagiri	63	18	0	0	1	0	64	18	82
29	Sangli	39	14	0	0	1	2	40	16	56

S. No.	District	Active		Dry		Wells Not Monitored		Total No of wells		
		DW	BW	DW	BW	DW	BW	DW	BW	Total well
30	Satara	54	3	0	0	1	0	55	3	58
31	Sindudurg	58	12	0	0	0	0	58	12	70
32	Solapur	54	7	0	0	2	1	56	8	64
33	Thane	22	1	0	0	2	0	24	1	25
34	Wardha	59	10	0	0	2	0	61	10	71
35	Washim	47	6	0	0	0	0	47	6	53
36	Yavatmal	75	27	1	0	1	0	77	27	104
	Grand Total	**1749**	**279**	**7**	**0**	**52**	**18**	**1808**	**297**	**2105**

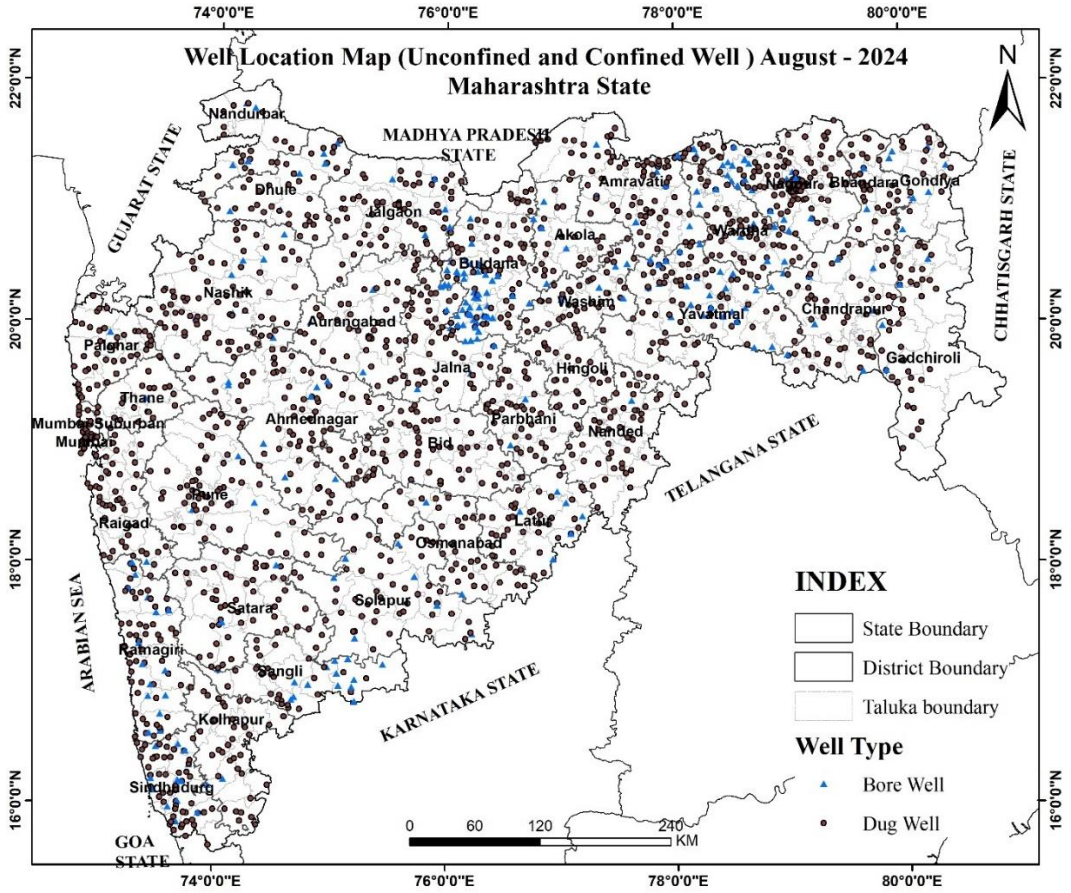


Fig. 2: Ground Water Monitoring Wells (GWMWs), Maharashtra.

4.0 RAINFALL

As per the IMD, the departure of monsoon rainfall from normal rainfall for the period from 1st June 2024 to 25th September 2024 (**Fig.3**) in 36 districts of Maharashtra has been considered to correlate the prevailing ground water level scenario. It is observed that out of 36 districts, 20 districts received excess rainfall, Hingoli district received deficient rainfall and remaining 15 districts have received normal rainfall during this period (**Table 2**).

Table 2: District wise departure of rainfall with respect to Normal rainfall (01-06-2024 to 25-09-2024)

S. No.	District	% Departure of Rainfall wrt Normal Rainfall	Category
1	Ahmednagar	51	Excess
2	Akola	9	Normal
3	Amravati	-7	Normal
4	Aurangabad (Chatrapati Sambhajinagar)	11	Normal
5	Beed	30	Excess
6	Bhandara	11	Normal
7	Buldhana	19	Normal
8	Chandrapur	14	Normal
9	Dhule	31	Excess
10	Gadchiroli	25	Excess
11	Gondia	6	Normal
12	Hingoli	-36	Deficient
13	Jalgaon	37	Excess
14	Jalna	28	Excess
15	Kolhapur	46	Excess
16	Latur	41	Excess
17	Mumbai city	9	Normal
18	Mumbai suburban	22	Excess
19	Nagpur	8	Normal
20	Nanded	16	Normal
21	Nandurbar	27	Excess
22	Nashik	38	Excess
23	Osmanabad (Dharashiv)	27	Excess
24	Palghar	25	Excess
25	Parbhani	32	Excess
26	Pune	42	Excess
27	Raigad	17	Normal
28	Ratnagiri	24	Excess
29	Sangli	56	Excess
30	Satara	16	Normal
31	Sindhudurg	41	Excess
32	Solapur	16	Normal
33	Thane	6	Normal

S. No.	District	% Departure of Rainfall wrt Normal Rainfall	Category
34	Wardha	27	Excess
35	Washim	15	Normal
36	Yavatmal	29	Excess

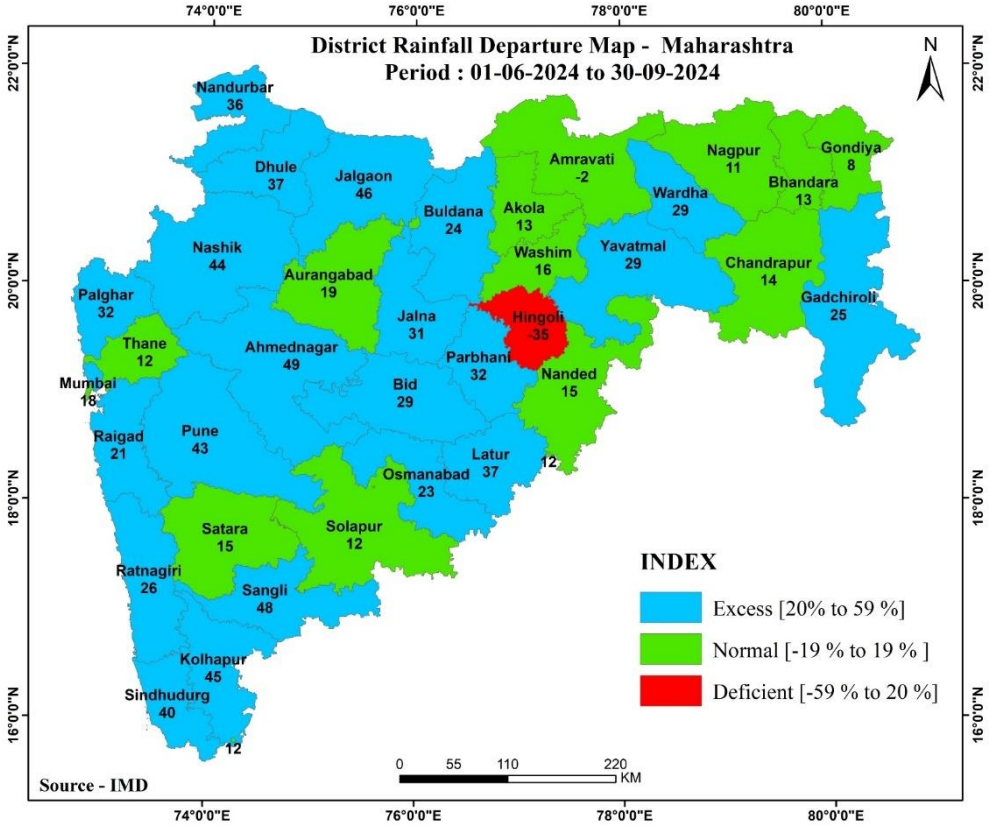


Figure 3. Rainfall Deviation from Normal Rainfall (01.06.2025 to 25.09.2025)

5.0 GROUND WATER LEVEL SCENARIO (AUGUST 2024)

5.1 SHALLOW AQUIFER (UNCONFINED)

5.1.1 DEPTH TO WATER LEVEL

Depth to water level in unconfined Aquifer (August 2024)

The depth to water level data of 1867 wells were used for the analysis. Depth to water level in shallow unconfined aquifer ranges from near ground level 0.01 mbgl (Nanded and Hingoli districts) to 51 mbgl (Latur district). Water level of less than 2 mbgl is recorded in 45.3% of wells, between 2 to 5 mbgl in 34% of wells, between 5 to 10 mbgl in 15% of wells, between 10 to 20 mbgl in 5% of wells and water level more than 20 mbgl is registered in ~1 % of wells. **(Fig 4)**

Water levels <2 mbgl are observed in ~45% of wells covering about 1,06,900 sq km area covering major parts of Raigad, Thane, Pune, Palghar,

Sindhudurg districts of Konkan region; Chandrapur, Gadchiroli and Bhandara districts of Vidarbha region; Kolhapur, Satara, Sangli and Pune districts of Western Maharashtra region and Nashik district of Khandesh region. Water levels between 2 and 5 mbgl covering an area of ~1,31,209 sq km are observed in 34% of wells covering major part of the state. About 15% of wells, covering an area of ~53,935 sq km show depth to water level between 5 to 10 mbgl covering major parts of Ahmednagar, Aurangabad, Jalna, and Parbhani districts. Depth to water levels in this range is also observed in northern part of the state regions and parts of almost all the districts except Mumbai, Raigad, Thane and Gadchiroli districts.

Deeper ground water levels ranging from 10 to 20 mbgl are observed in ~5% of wells covering ~12395 sq km area of the State and are observed in northern part of State covering Tapi and Purna River basins in parts of Nandurbar, Dhule, Jalgaon, Buldhana, Akola and Amravati districts. Apart from this, isolated small patches are also observed mainly in all the districts of Marathwada region and Nagpur and Wardha districts of Vidarbha region. Depth to water levels of >20 mbgl (~1% wells), covering about 2337 sq. km area is observed in northern part of the state occupied by Tapi and Purna alluvium basin in parts of Nandurbar, Dhule, Jalgaon, Akola and Amravati districts. **(Fig 5)**

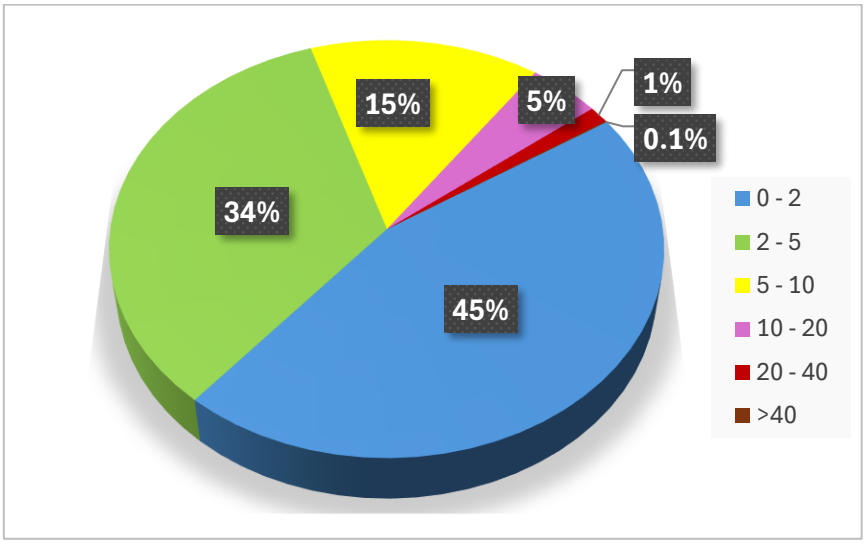


Fig. 4: Percentage of wells in different water level ranges in unconfined aquifer.

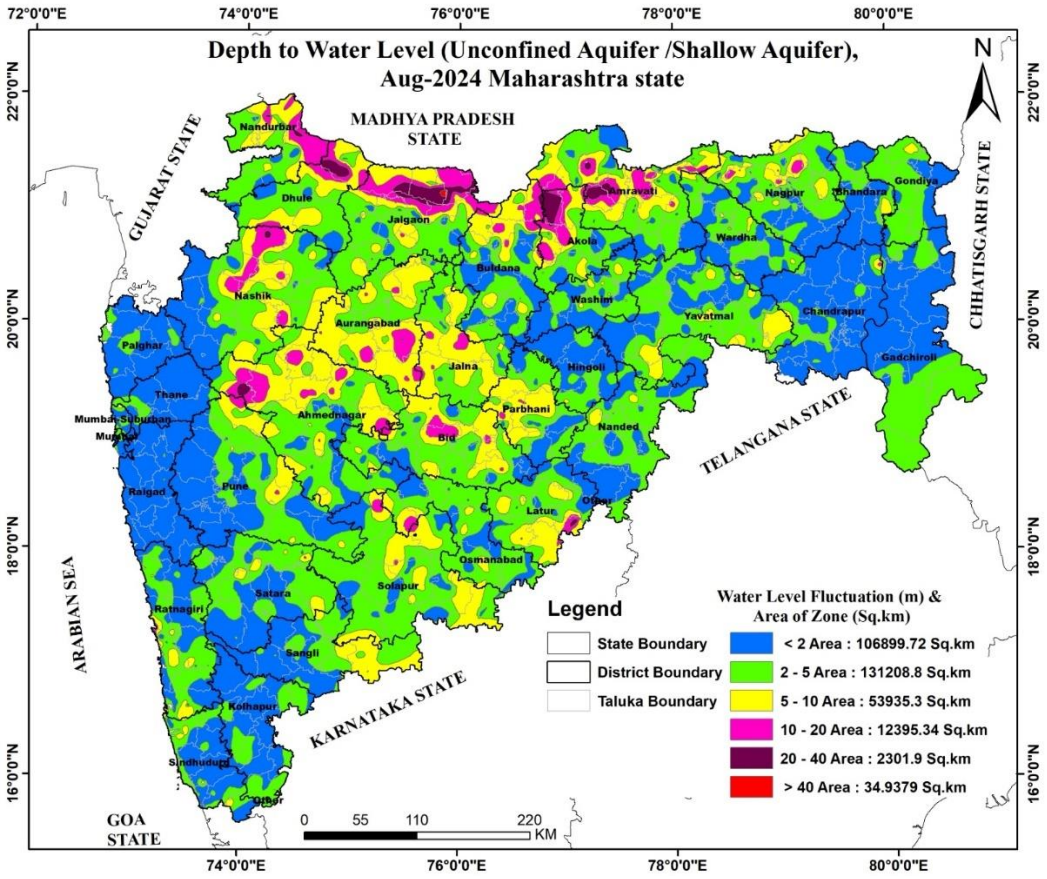


Fig. 5: Depth to Water Level of Unconfined Aquifer During August 2024

5.1.2 SEASONAL FLUCTUATION IN WATER LEVEL FLUCTUATION

Seasonal Fluctuation of Water level in Unconfined Aquifer (May 2024 to August 2024)

Water Levels from 1897 station were compared with that of May 2024 to know the seasonal changes in ground water in August 2024. Out of the whole 96% of the wells have recorded a rise in water level and the remaining 4% of the wells have recorded a fall in water level. **(Fig 6)**

Rise in Water Level:

The water levels have shown a general rise in the order of 0 to > 4 m in ~96% of wells in all districts of Maharashtra State. The rise is due to the monsoon rainfall recharge to the ground water regime. A significant rise in water level (rise > 4 m) was observed in ~50% of wells covering about 1,71,302 sq km area. It is observed in a major part of the state. The rise in water level up to 4 m was observed in ~47% of wells covering an area of 1,31,343 sq km is observed mainly in parts of all the districts of Vidarbha, Western Maharashtra and Konkan region. **(Fig 7)**

Fall in Water Level:

About 4% of the wells covering ~4132 sq km area show a decline in water level in the range of 0 to >4 m. Out of which 2.5% of the wells show falling water level up to 2m and 1% of the show fall in water level in the range of 2-4 and >4 m. The decline may be due to less/ negative departure in rainfall received in these areas and are observed in small, isolated patches of Amravati, Nagpur, Wardha, Jalgaon, Dhule, Jalna, Ahmednagar, Latur and Osmanabad districts. **(Fig 7)**

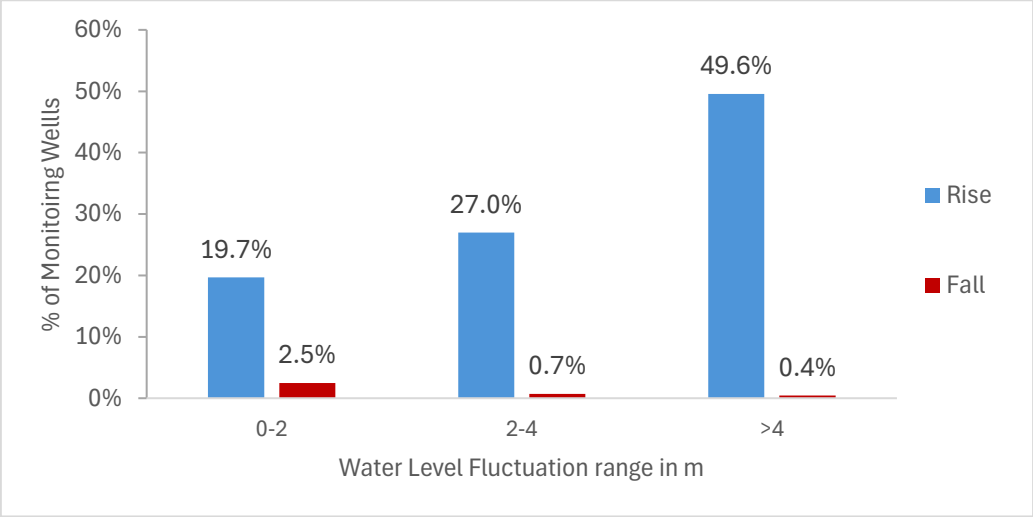


Fig. 6: Percentage of wells showing rise and fall in water level in unconfined aquifer. (May 2024 to August 2024)

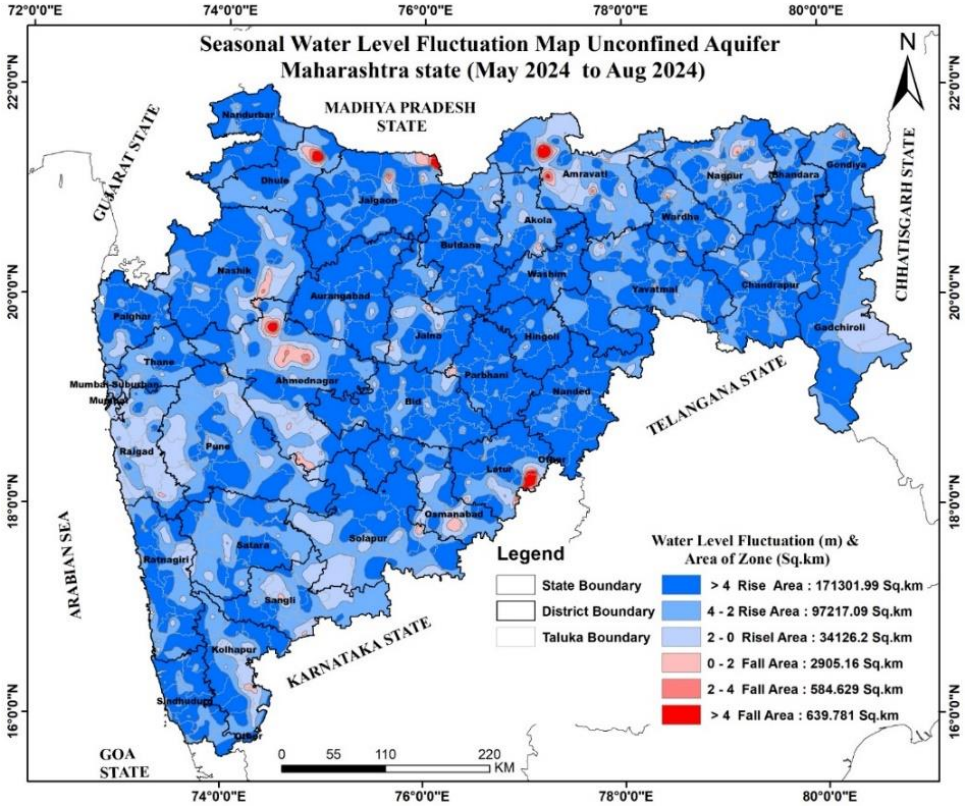


Fig. 7: Seasonal water level Fluctuation in unconfined aquifer. (May 2024 to August 2024)

5.1.3 ANNUAL FLUCTUATION IN WATER LEVEL FLUCTUATION

Annual Fluctuation of Water level in Unconfined Aquifer (August 2023 to August 2024)

Water Levels from 1852 station were compared with that of August 2023 to know the annual changes in ground water in August 2024. Out of total, 70% of wells have recorded a rise in water level and the reanimating 28% of the wells have recorded a fall in water level. About 2% of the wells show no fluctuation. **(Fig 8)**

Rise in Water Level:

About 70% of wells show a general rise in the order of 0 to >4 m. The rise is due to good rainfall received in 2024. A significant rise in water level (rise > 4 m) was observed in ~10% of wells covering ~23,148 sq km area mainly observed in parts Pune, Ahmednagar, Beed, Solapur and Sindhudurg districts and isolated patches of almost all the districts except Mumbai, Chandrapur and Gadchiroli districts. The rise in water level up to 4 m covering an area of ~2,18,997 sq km is observed in major parts of all the districts of Maharashtra State. **(Fig 9)**

Fall in Water Level:

About 28% of the wells covering about 64,627 sq km area in Maharashtra show a decline in water level in the range of 0 to >4 m. Out of which 22% of the wells show a falling water level up to 2m and 4% of the show fall in water level in the range of 2-4 and 2% of wells show water level >4 m.

The decline in water levels up to 2 m covering an area of ~56,503 sq km is observed mainly in parts of almost all the districts of Vidarbha region; Jalna, Beed, Parbhani, Latur districts of Marathwada region, Raigad and Thane districts of Konkan region and Ahmednagar, Nashik and Dhule districts of Khandesh region. Decline in water levels >2m has been observed in isolated small parts of Nagpur, Amravati, Wardha, Yavatmal, Nashik, Aurangabad, Ahmednagar and Latur districts covering 8124 sq km. **(Fig 9)**

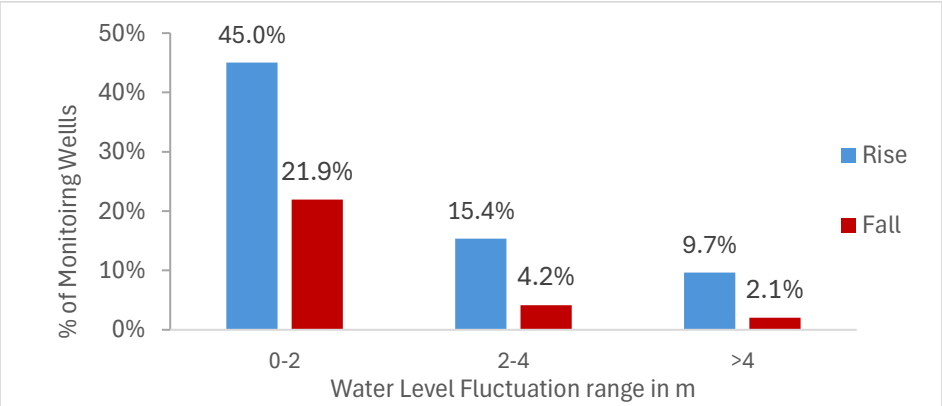


Fig. 8: Percentage of wells showing rise and fall in water level in unconfined aquifer (August 2023 to August 2024)

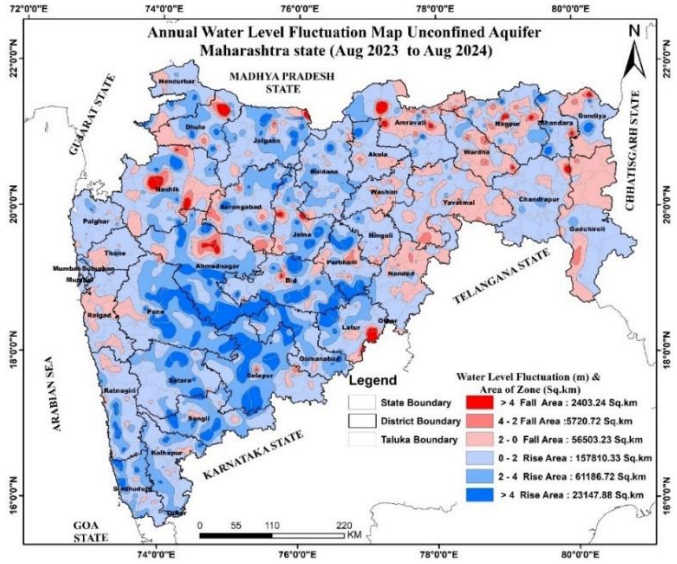


Fig. 9: Annual water level Fluctuation in unconfined aquifer. (August 2023 to August 2024)

Annual Fluctuation of Water level in Unconfined Aquifer (August 2022 to August 2024)

Water Levels from 1565 stations were compared with that of August 2022 to know the annual changes in ground water in August 2024. Out of the total, 48% of the wells have recorded a rise in water level and the remaining 49% of the wells have recorded a fall in water level. About 3% of the wells show no fluctuation. **(Fig 10)**

Rise in Water Level:

Rise water level of less than 2 m is recorded in 37 % wells, 2 to 4 m in 7.3% wells and more than 4 m in 3.4% of the wells. Rise in water level less than 2m is observed in 1,23,766 sq km area of the state covering major parts of all the districts of Konkan and Western Maharashtra region and Chandrapur, Buldhana, Washim and Akola districts of Vidarbha region. Whereas rise in water level >2 m has been observed mainly in parts of Jalgaon, Satara, Solapur, Buldhana, Parbhani, Nanded and Amravati districts. **(Fig 11)**

Fall in Water Level:

Fall in water level of less than 2 m is recorded in ~35 % wells, 2 to 4 m in ~8% wells and more than 4 m in ~6% of the wells. Fall in water Level less than 2 m is observed 1,24,887 sq km covering mainly in parts of almost all the districts of Vidarbha, Marathwada and Khandesh regions whereas fall in Water level >2 m is observed in 38,225 sq km. area covering mainly

in parts of Amravati, Nagpur, Buldhana, Nashik, Yavatmal, Ahmednagar, Beed, Aurangabad and Jalna districts. **(Fig 11)**

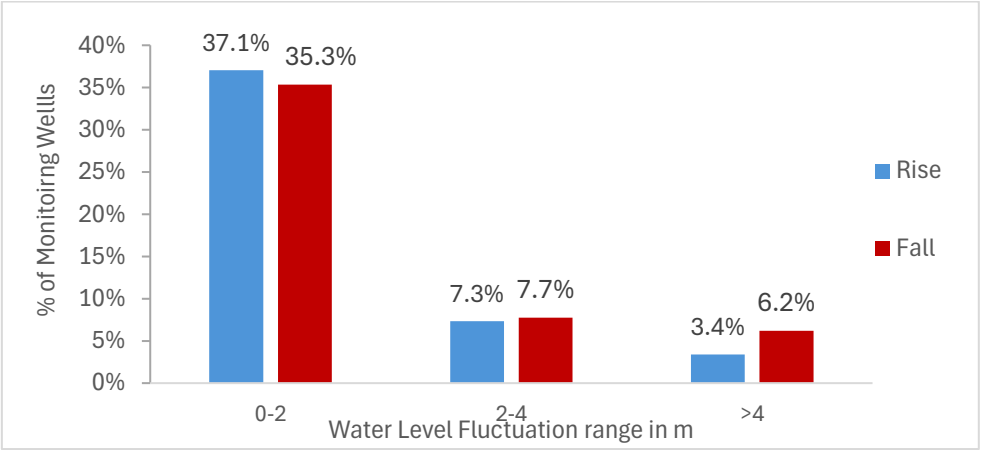


Fig. 10: Percentage of wells showing rise and fall in water level in unconfined aquifer. (August 2022 to August 2024)

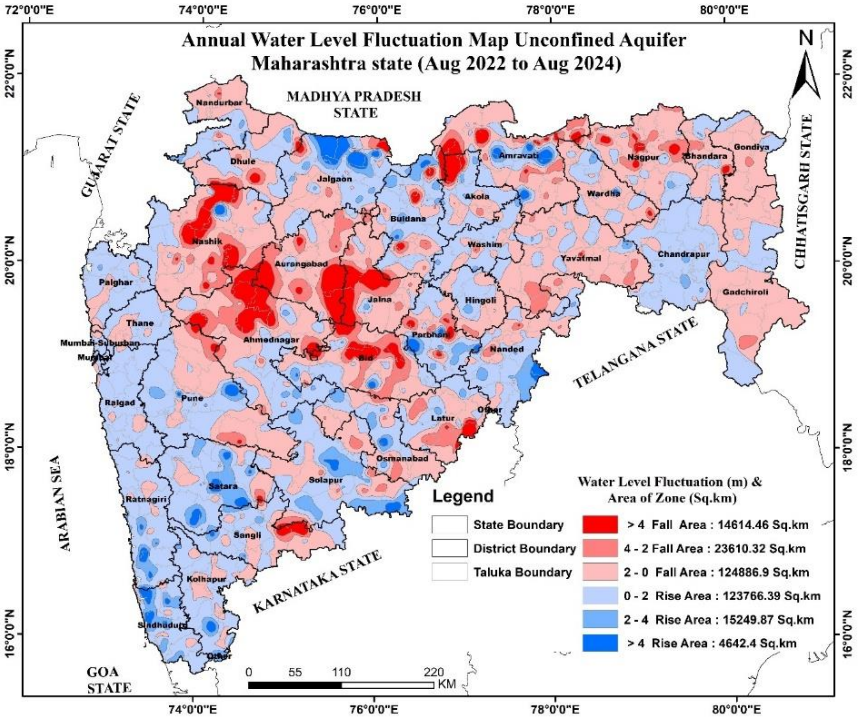


Fig. 11: Annual water level Fluctuation in unconfined aquifer. (August 2022 to August 2024)

5.1.4 DECADAL FLUCTUATION IN WATER LEVEL

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

Mean ground water levels for the period of August 2014-23 were compared with the Ground water level of August 2024. It is observed that, out of 1903 stations compared, 1463 stations accounting for 77% have shown rise in water level and 435 stations accounting for 23% have shown fall in water level. About 5 stations (0.26%) have shown no fluctuation. **(Fig 12)**

Rise in Water Level:

Rise in water level of less than 2 m is recorded in 49 % wells, 2 to 4m in 18 % wells and more than 4 m in ~10% of the wells. Rise in water Level <2 m is observed in major parts of the state covering 1,71,407 sq km whereas rise in water level between 2-4 and >4 m has been observed mainly in parts of Marathwada and Western Maharashtra region, Jalgaon district of Khandesh region and Akola and Buldhana districts of Vidarbha region. Apart from this, isolated small parts are observed in almost all the districts except Mumbai city, Mumbai suburban and Raigad districts covering an area of 87,249 sq km.

Fall in Water Level:

Fall in water levels of less than 2 m is recorded in ~18% wells, 2 to 4 m in ~3% wells and more than 4 m in ~2% of the wells. Fall in water Level <2 m is observed covering 40,775 sq km in isolated parts of all the districts of the state. Fall in Water level between 2 to 4 m and >4 m is observed mainly in isolated parts of Nagpur, Bhandara, Gondia, Amravati, Buldhana, Ahmednagar, Beed, Jalna, Wardha, Yavatmal, Aurangabad, Dhule and Nashik districts covering an area of ~7322 sq km. **(Fig 13)**

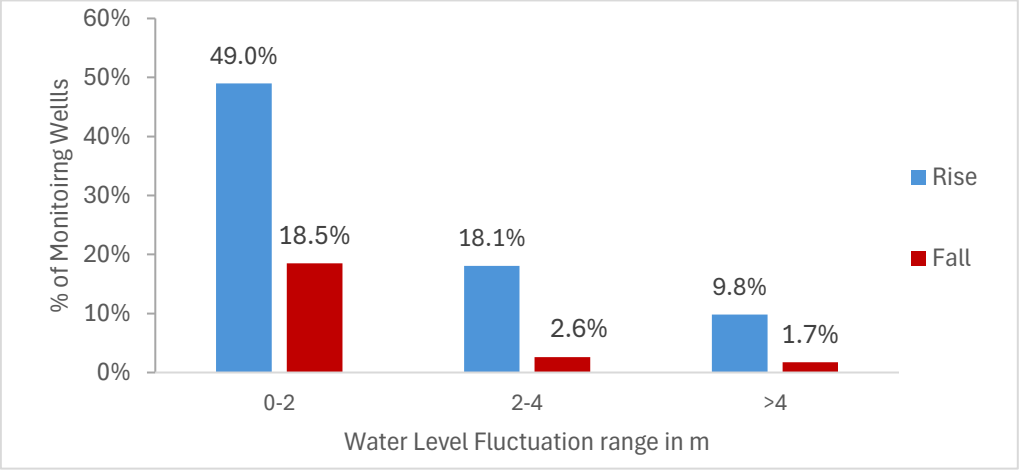


Fig.-12: Percentage of wells showing rise and fall in WL in unconfined Aquifer {Decadal Mean August (2014 -2023) to August 2024}

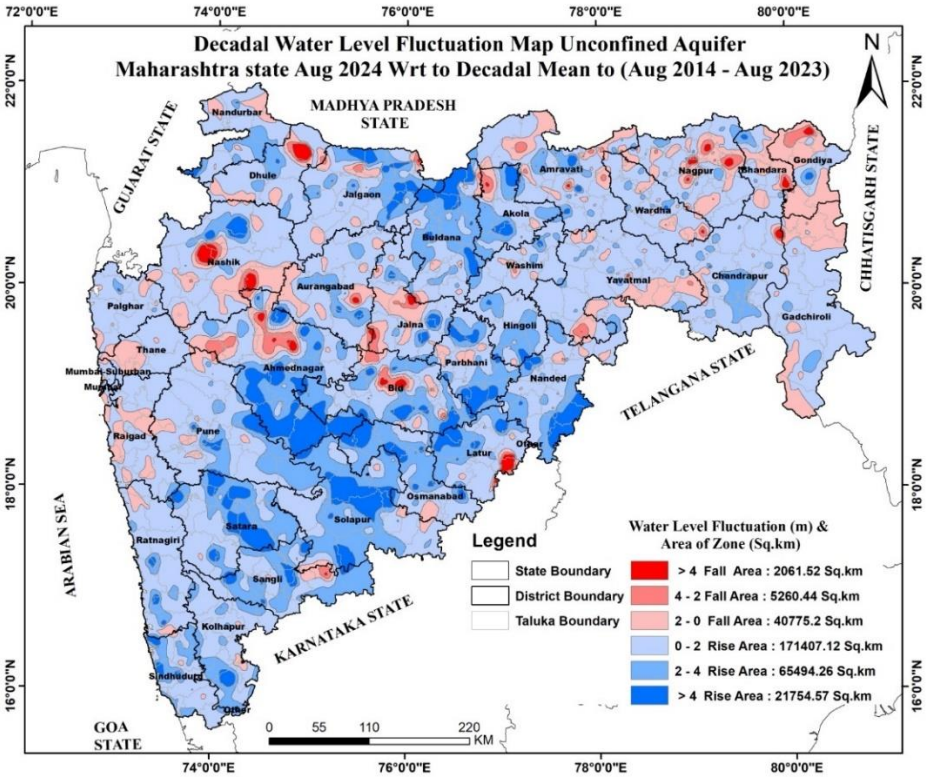


Fig.-13: Decadal Water level fluctuation in unconfined aquifer (Decadal Mean August (2014 -2023) to August 2024)

5.2 DEEPER AQUIFER (SEMI-CONFINED/ CONFINED)

5.2.1 DEPTH TO PIEZOMETRIC LEVEL

Depth to Piezometric level in Semi-Confined/Confined Aquifer (August 2024)

Analysis of piezometric level data of 191 wells shows piezometric level varies between 0.01 mbgl (Abloli, Ratnagiri district) to 182.95 mbgl (Bevanur, Sangli district). Piezometric level of less than 2 mbgl is recorded in 23% of wells, between 2 to 5 mbgl in 25%, between 5 to 10 mbgl 25%, between 10 to 20 mbgl in 13%, between 20-40 mbgl in 6%, more than 40 is recorded in 8% of wells. **(Fig 14)**

Shallow piezometric level of less than 2mbgl is observed in 23% of the wells in isolated patches of Nagpur, Chandrapur, Yavatmal, Nanded, Dhule and Sangli districts. Piezometric level between 2 to 5 mbgl is observed in 25% wells covering mainly parts of Buldhana, Nagpur, Yavatmal, Amravati, Jalgaon, Sangli, Pune, Ratnagiri and Sindhudurg districts. Piezometric level between 5 to 10 mbgl is observed in 25% of the wells covering mainly in parts of Buldhana, Nagpur, Yavatmal, Ratnagiri, Sindhudurg, Sangli and Ahmednagar districts. Piezometric level between 10 to 20 mbgl covering 13% of the wells mainly in parts of Ahmednagar, Buldhana, Nagpur, Sangli, Ratnagiri and Nashik districts. Deeper

Piezometric level >20 mbgl is observed in 14% of the wells mainly in parts of Ratnagiri and Sangli districts. **(Fig 15)**

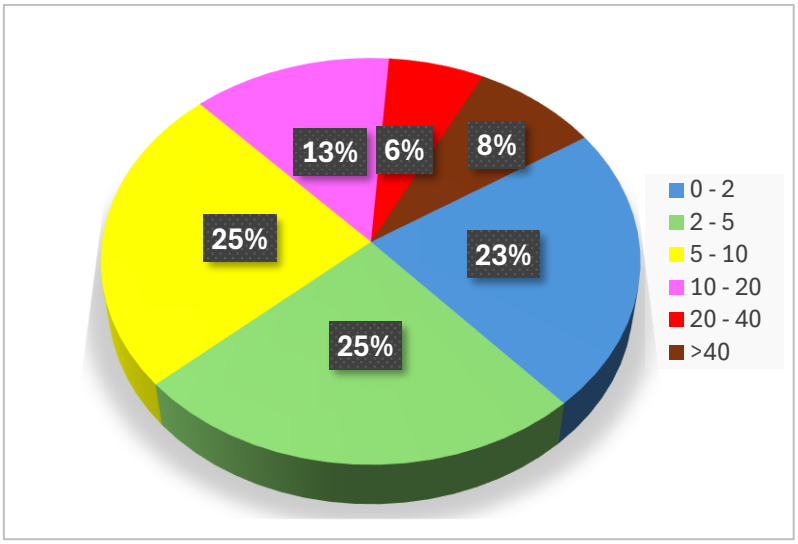


Fig 14: Percentage of wells in different Piezometric Level (August 2024).

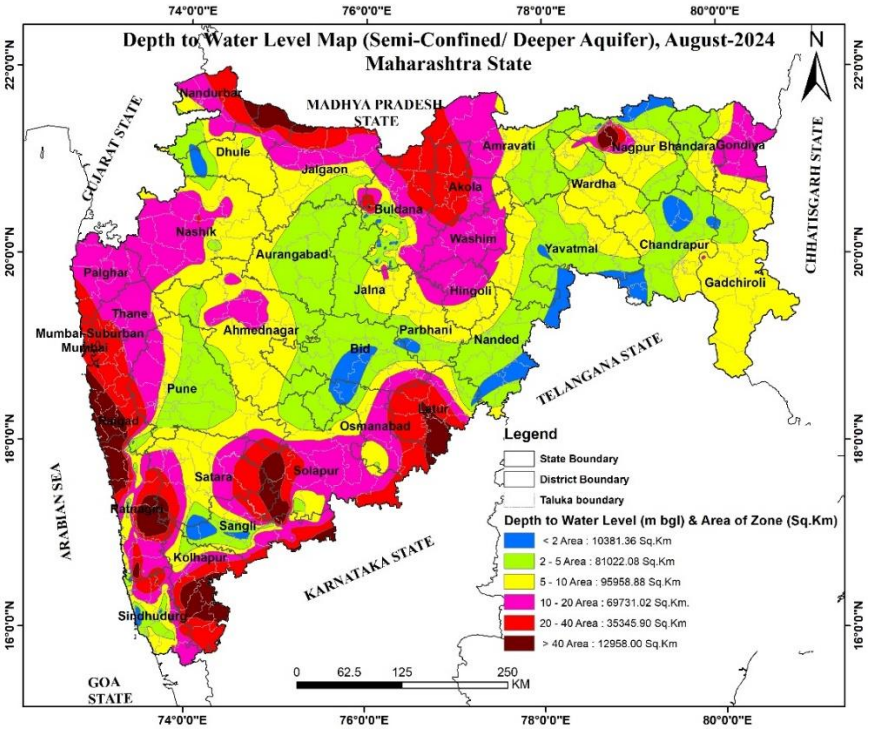


Fig 15: Depth to Piezometric Level in deeper Aquifer in August 2024.

5.2.2 SEASONAL FLUCTUATION IN PIEZOMETRIC LEVEL

Seasonal Fluctuation of Piezometric level in Semi-Confined/Confined Aquifer (May 2024 to August 2024)

Rise in Water Level:

Out of 178 wells analyzed, 161 wells show rise in water level in the range of 0-2, 2-4 and >4 m. Piezometric water level rise of less than 2 m is recorded in 11 % wells, 2 to 4 m in 18% wells and more than 4 m in 61% of the wells. Piezometric level rise of less than 2 m is significantly seen in Nagpur, Buldhana, Ahmednagar, Sindhudurg and Sangli districts. Piezometric level of 2 to 4 m is observed mainly in districts such as Buldhana, Nagpur, Chandrapur, Sangli, Ratnagiri and Sindudurg districts. Piezometric level rise of more than 4 m is significantly observed in Buldhana, Ratnagiri, Sindudurg Solapur, Sangli and Nagpur districts. **(Fig 16)**

Fall in Water Level:

Out of 178 wells analyzed, 17 wells (10%) show a fall in water level in the range of 0-2, 2-4 and >4 m. Fall in water level of less than 2 m is recorded in 5 % wells, 2 to 4 m in 2.8% wells and more than 4 m in 1.7% of the wells. Fall of less than 2 m is mainly observed in isolated parts of Buldhana, Ahmednagar, Nagpur, Parbhani, Pune and Sangli districts. Fall of 2 to 4 m and > 4 m is observed as isolated patch in Nagpur, Sangli, Latur, Ahmednagar, Akola and Buldhana districts. **(Fig 916)**

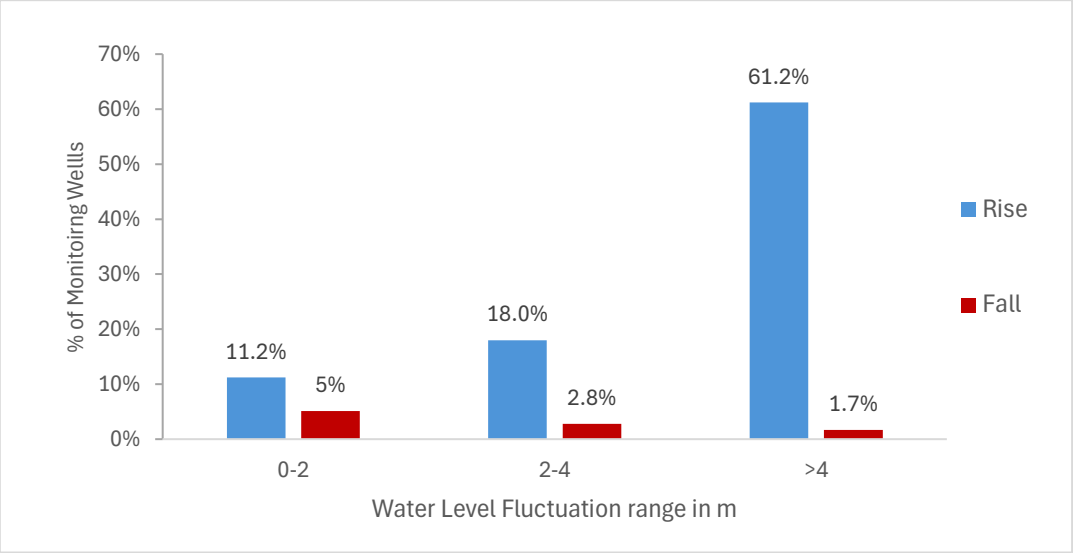


Fig 16: Percentage of Wells showing rise and fall in Piezometric level in Semi-Confined/Confined Aquifer (May 2024 to August 2024)

5.2.3 ANNUAL FLUCTUATION IN PIEZOMETRIC LEVEL

Annual Fluctuation of Piezometric level in Semi-Confined/Confined Aquifer (August 2023 to August 2024)

Rise in Water Level:

Out of 134 Wells analysed, 108 wells show rise in water level in the range of 0-2, 2-4 and >4 m. Piezometric water level rise of less than 2 m is

recorded in 37 % wells, 2 to 4 m in 21% wells and more than 4 m in 23% of the wells. Piezometric level rise of less than 2 m is seen in almost all the districts, significantly in Buldhana, Ratnagiri, Sindudurg and Yavatmal districts. Piezometric level of 2 to 4 m is observed mainly in parts of Buldhana, Ratnagiri, Aurangabad, Dhule and Sindhudurg districts. Piezometric level rise of more than 4 m is observed mainly in parts of Buldhana, Ratnagiri, Ahmednagar, Jalgaon, Nashik, Nandurbar and Solapur districts. **(Fig 17)**

Fall in Water Level:

Out of 134 Wells analysed, 26 wells show fall in water level in the range of 0-2, 2-4 and >4 m. Fall in water level of less than 2 m is recorded in 8% wells, 2 to 4 m in 3% wells and more than 4 m in 8.2% of the wells. Fall of less than 2 m is mainly observed mainly in parts of Buldhana and Ahmednagar districts.

Fall of 2 to 4 m is observed in isolated parts of Gadchiroli, Gondia, Nashik and Ratnagiri districts. Fall >4 m is observed mainly in parts of Ratnagiri and Latur districts and isolated parts of Ahmednagar, Buldhana, Dhule, Kolhapur, Nagpur and Solapur districts. **(Fig 17)**

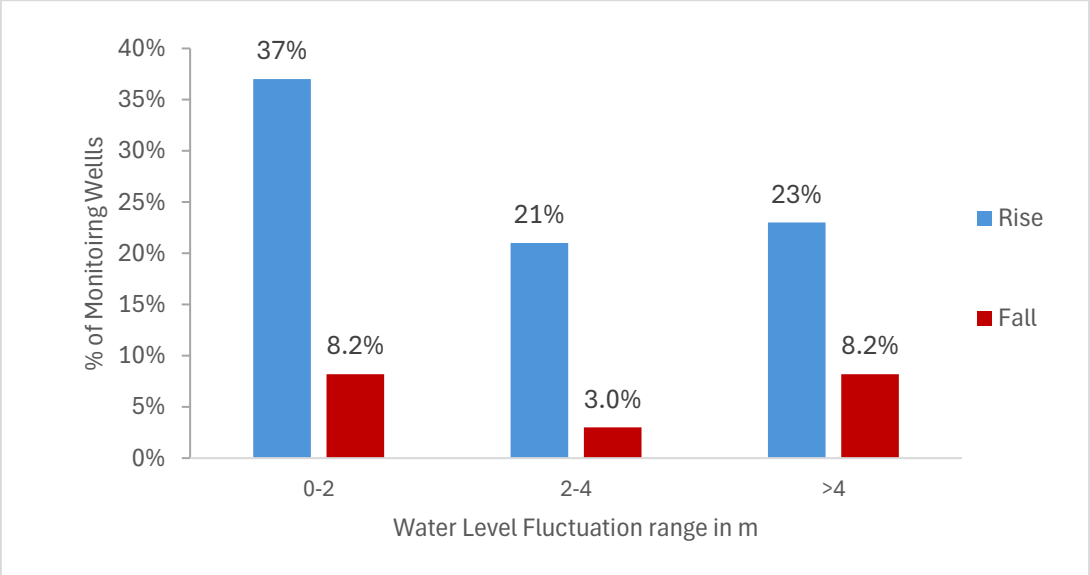


Fig 17: Percentage of Wells showing rise and fall in Piezometric level in Semi-Confined/Confined Aquifer (August 2023 to August 2024)

Annual Fluctuation of Piezometric level in Semi-Confined/Confined Aquifer (August 22 to August 2024)

Rise in Water Level:

Out of 55 Wells analysed, 29 wells show rise in water level in the range of 0-2, 2-4 and >4 m. Piezometric water level rise of less than 2 m is recorded in 38% wells, 2 to 4 m in 11% wells and more than 4 m in 3.6% of the

wells. Piezometric level rise of less than 2 m is seen in almost all the districts, significantly in Ahmednagar, Aurangabad, Yavatmal, Satara and Solapur districts. Piezometric levels of 2 to 4m is observed in isolated parts of Chandrapur, Ahmednagar, Parbhani, Osmanabad and Washim districts. Piezometric level rise of more than 4 m is observed only in parts of Jalgaon district. **(Fig 18)**

Fall in Water Level:

Out of 55 Wells analysed, 26 wells show fall in water level in the range of 0-2, 2-4 and >4 m. Fall in water level of less than 2 m is recorded in 24% wells, 2 to 4 m in 1.8% wells and more than 4 m in 22% of the wells. Fall of less than 2 m is observed significantly in parts of Yavatmal, Nashik and Pune districts. Fall of 2 to 4 m is observed in isolated part of Dhule district. Fall >4 m is observed in parts of Ahmednagar, Dhule, Gondia, Kolhapur, Latur, Nashik, and Solapur districts. **(Fig 18)**

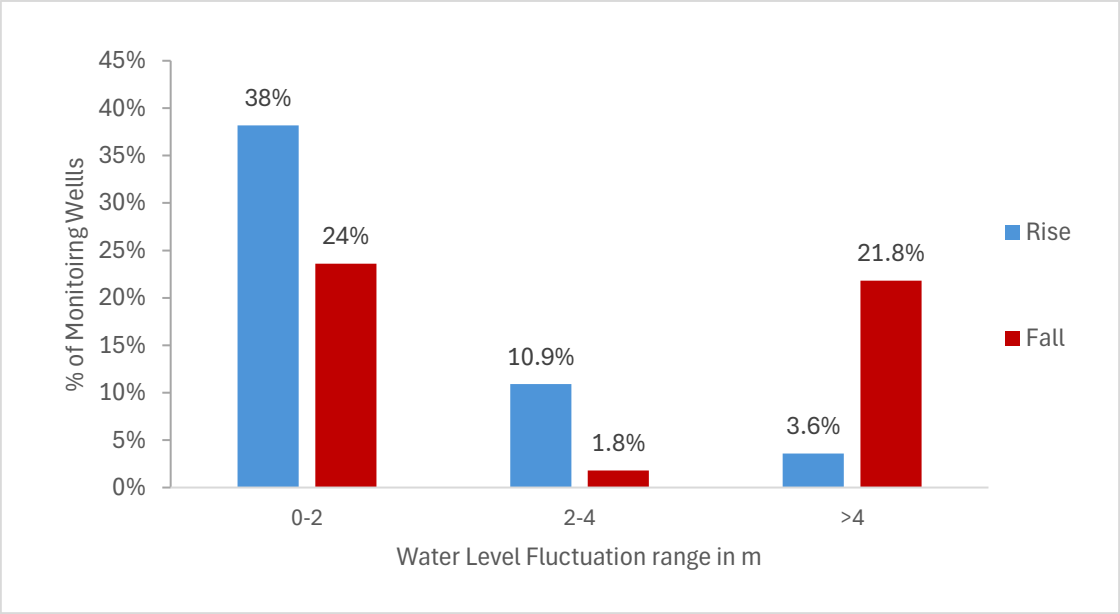


Fig 18: Percentage of Wells showing rise and fall in Piezometric level in Semi-Confined/Confined Aquifer (August 22 to August 2024)

5.2.4 DECADAL FLUCTUATION IN WATER LEVEL

Decadal Fluctuation of Piezometric level in Semi-Confined/Confined Aquifer (August (2014-2023) to August 2024)

Rise in Water Level:

Out of 137 Wells analysed, 104 wells show rise in water level in the range of 0-2, 2-4 and >4 m. piezometric water level rise of less than 2 m is

recorded in 33 % wells, 2 to 4 m in 19 % wells and more than 4 m in 24 % of the wells. Piezometric level rise of less than 2 m is seen in almost all the districts, significantly in Buldhana, Chandrapur, Dhule, Ratnagiri and Sindudurg districts. Piezometric level of 2 to 4 m is observed mainly in parts of Buldhana, Ratnagiri, Sindhudurg and Yavatmal districts. Piezometric level rise of more than 4 m is observed mainly in parts of Buldhana, Ahmednagar, Jalgaon, Nandurbar, Nashik, Parbhani, Ratnagiri and Solapur districts. **(Fig 19)**

Fall in Water Level:

Out of 131 Wells analysed, 33 wells show fall in water level in the range of 0-2, 2-4 and >4 m. Fall in water level of less than 2 m is recorded in 12 % wells, 2 to 4 m in 4.4% wells and more than 4 m in 8% of the wells. Fall of less than 2 m is mainly observed in parts of Buldhana, Gondia and Ratnagiri districts. Fall of 2 to 4 m is observed in isolated parts of Ahmednagar, Gadchiroli, Nashik, Ratnagiri and Solapur districts. Fall >4 m is observed in parts of Buldhana, Dhule, Gondia, Kolhapur, Latur, Ratnagiri and Solapur districts. **(Fig 19)**

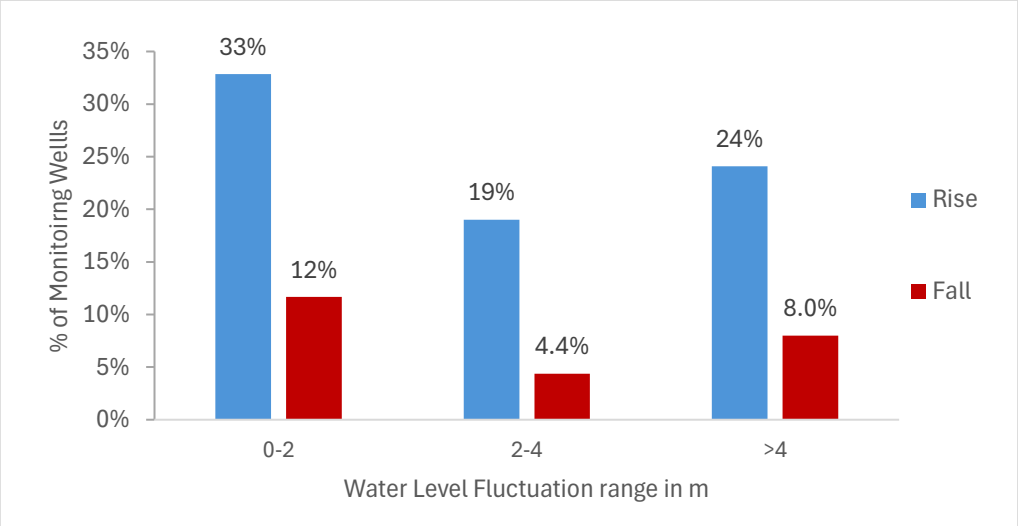


Fig 19: Percentage of Wells showing rise and fall in Piezometric level in Semi-Confined/Confined Aquifer {Decadal mean August (2014-23) to August 2024)

6.0 SUMMARY

The groundwater levels in the state are monitored through a network of 2105 wells during four times a year: August, November, January and May and this report evaluates groundwater levels during August 2024.

Un-confined (Shallow) Aquifer:

- The water levels from both un-confined (Shallow Aquifer) and confined/semi-confined (Deeper Aquifer) are analyzed for their distribution with different ranges and also compared with annual and decadal water levels.
- During this season, in shallow aquifer water levels are in the range of 0.01 to 51 mbgl and the more predominate water level range is 2-5 m, which occupies about 1,31,209 sq.km area of the state and in 34% of wells. Shallowest levels were observed in Nanded and Hingoli districts, while the deepest in Latur district. In most of coastal region, water levels are very shallow (0-2 m and 2-5 mbgl). In northern part, deeper water levels (>10 m) are observed.
- The season fluctuations in water levels during August-24 with respect to May-24 shows that 96% of wells have shown rise in water levels covering the districts of almost all the districts of the state. About 4% of the wells shown fall in water level observed mostly Amravati, Nagpur, Wardha, Jalgaon, Dhule, Jalna, Ahmednagar, Latur and Osmanabad districts.
- The annual fluctuations during August-24 WRT to August-23, 70% of wells shown rise in water levels in the ranges of 0-2, 2-4 and > 4 m and fall in water levels is observed in about 28 % of wells. The rise in water level is observed in major parts of the state covering 2,42,145 sq km and fall in water level is observed mainly in all the districts of Vidarbha region Jalna, Beed, Parbhani, Latur districts of Marathwada region, Raigad and Thane districts of Konkan region and Ahmednagar, Nashik and Dhule districts of Khandesh region.
- The annual fluctuations during August-24 WRT to August-22 shows 48% rise in water levels in the range of 0-2,2-4 and > 4 m and 49% of wells fall in water levels. Rise is mostly observed in almost all the districts of Konkan and Western Maharashtra region and fall is observed mainly in parts of Vidarbha and Marathwada region.
- The decadal fluctuations in water levels during August-24 with respect to last decade (2014-23) of the same season shows a rise in 77% of wells, covering 2,58,656 sq. km area of state mainly in parts of Marathwada and Western Maharashtra region. Fall in water levels is observed in 23 % of wells and Decline of > 2 m is observed mainly in isolated parts of Nagpur, Bhandara, Gondia, Amravati, Buldhana, Ahmednagar, Beed, Jalna, Wardha, Yavatmal, Aurangabad, Dhule and Nashik districts covering an area of ~7322 sq km.

Semi-Confined/Confined Aquifer (Deeper Aquifer):

- In deeper aquifers (confined/semi-confined) water levels are in the range of 0.01 to 182.95 mbgl, shallowest in Ratnagiri and deepest in Sangli district.
- The season fluctuations in water levels during August-24 with respect to May-24 show that in 90 % of wells have shown rise in water levels and 10% wells show fall in water level.
- The annual fluctuations during August-24 WRT to August-23 show rise in water levels in the range of 0-2,2-4 and > 4 m in 81 % of wells and fall in water levels is observed in about 19 % of wells.
- The annual fluctuations during August-24 WRT to August-22 show rise in water levels in the range of 0-2,2-4 and > 4 m in 53 % of wells and fall in water levels is observed in about 47% of wells.
- The decadal fluctuations during August-24 WRT to August-2014-23 show rise in water levels in the range of 0-2,2-4 and > 4 m in 76 % of wells and fall in water levels is observed in about 24 % of wells.