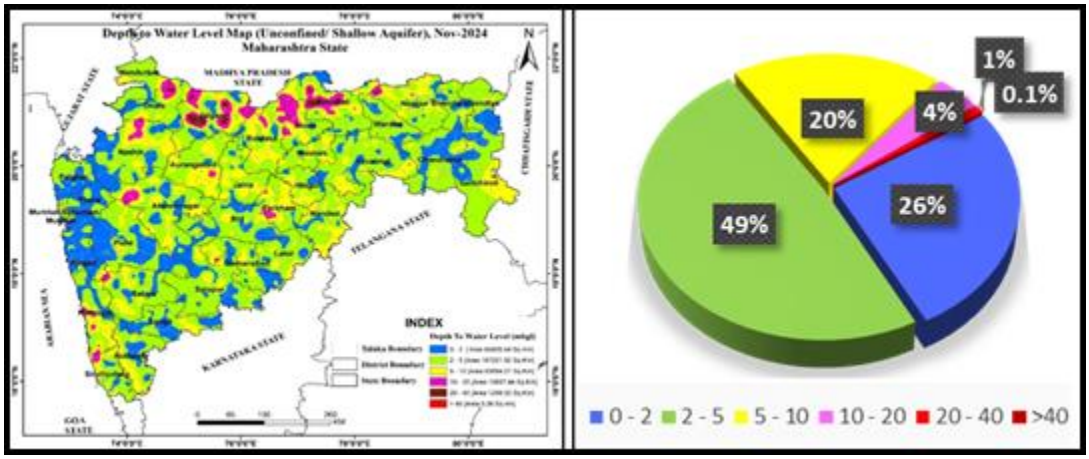
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION



GROUND WATER LEVEL BULLETIN

November- 2024

Maharashtra

ABSTRACT

Ground water level Scenario during November-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 2175 observation wells known as the Ground Water Monitoring Wells (GWMW's) located all over Maharashtra which comprises of 1776 dug wells and 314 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.

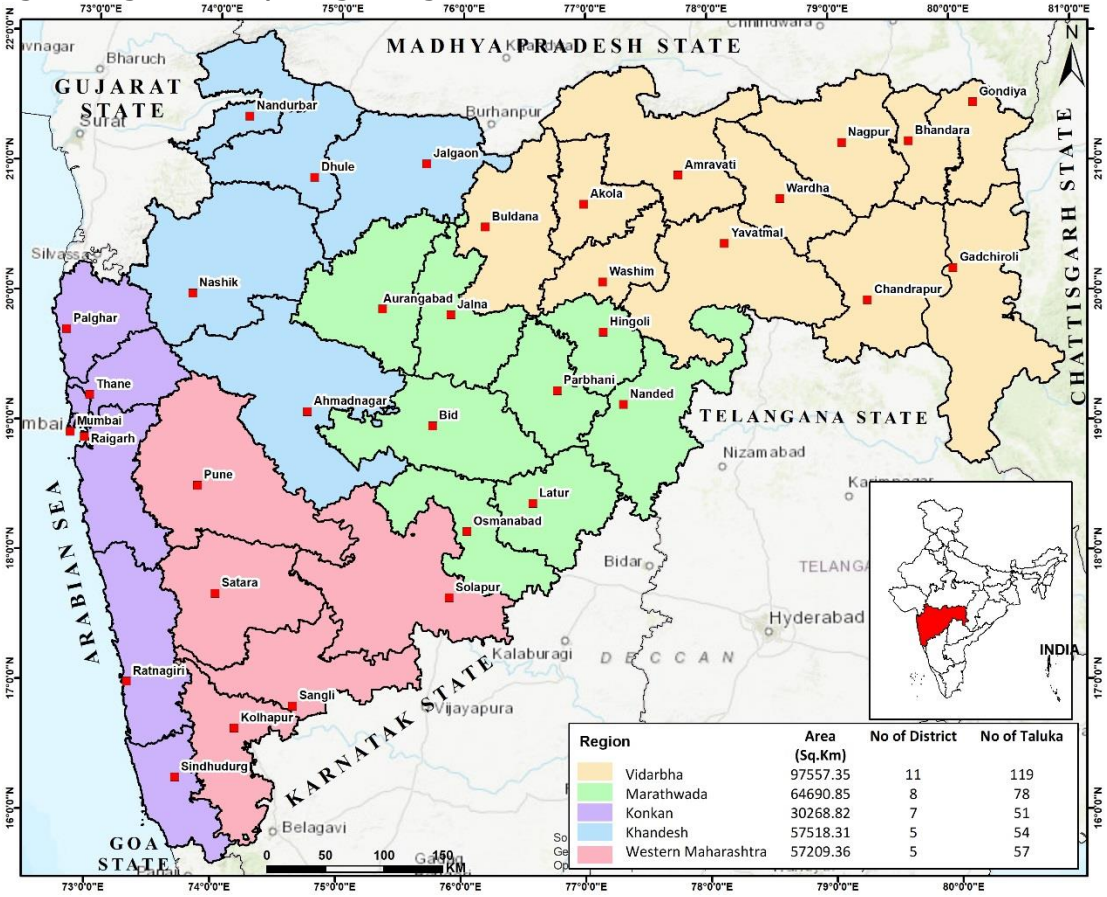


Fig. 1: Location & administrative division, Maharashtra state.

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 2175 Ground Water Monitoring Wells (GWMW) (DW: 1857 & Pz: 318) 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 November-2024, 2111 GWMWs (DW: 1820; PZs: 291) were monitored over entire Maharashtra. However, 64 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 November 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 November 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	78	11	1	1	1	0	80	12	92
2	Akola	25	6	0	0	1	1	26	7	33
3	Amravati	85	12	0	0	6	4	91	16	107
4	C. Sambhaji Nagar (Aurangabad)	50	4	0	0	0	1	50	5	55
5	Beed	64	1	1	0	0	0	65	1	66
6	Bhandara	30	2	0	0	1	2	31	4	35
7	Buldana	69	52	0	0	2	1	71	53	124
8	Chandrapur	62	10	0	0	2	2	64	12	76
9	Dhule	37	6	0	0	0	0	37	6	43
10	Gadchiroli	43	4	0	0	0	0	43	4	47
11	Gondia	18	8	0	0	1	0	19	8	27
12	Hingoli	28	0	0	0	1	0	29	0	29
13	Jalgaon	62	5	0	0	0	0	62	5	67
14	Jalna	49	6	0	0	0	0	49	6	55
15	Kolhapur	41	4	0	0	0	0	41	4	45
16	Latur	41	6	0	0	0	1	41	7	48

S. No.	District	Active		Dry		Wells Not Monitored		Total No of wells		
		DW	BW	DW	BW	DW	BW	DW	BW	Total well
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	158	32	0	0	1	1	159	33	192
20	Nanded	54	1	0	0	2	1	56	2	58
21	Nandurbar	22	4	0	0	0	0	22	4	26
22	Nashik	71	7	0	0	0	0	71	7	78
23	Dharashiv (Osmanabad)	38	2	0	0	1	1	39	3	42
24	Parbhani	44	2	0	0	3	0	47	2	49
25	Pune	65	5	0	0	2	0	67	5	72
26	Raigad	49	1	0	0	0	0	49	1	50
27	Ratnagiri	63	18	0	0	2	0	65	18	83
28	Sangli	38	16	0	0	2	4	40	20	60
29	Satara	50	3	0	0	4	1	54	4	58
30	Sindudurg	58	15	0	0	0	1	58	16	74
31	Solapur	52	7	0	0	3	1	55	8	63
32	Thane and Palghar	66	2	0	0	0	0	66	2	68
33	Wardha	59	8	0	0	2	2	61	10	71
34	Washim	47	5	0	0	0	1	47	6	53
35	Yavatmal	77	25	0	0	0	2	77	27	104
	Grand Total	**1818**	**290**	**2**	**1**	**37**	**27**	**1857**	**318**	**2175**

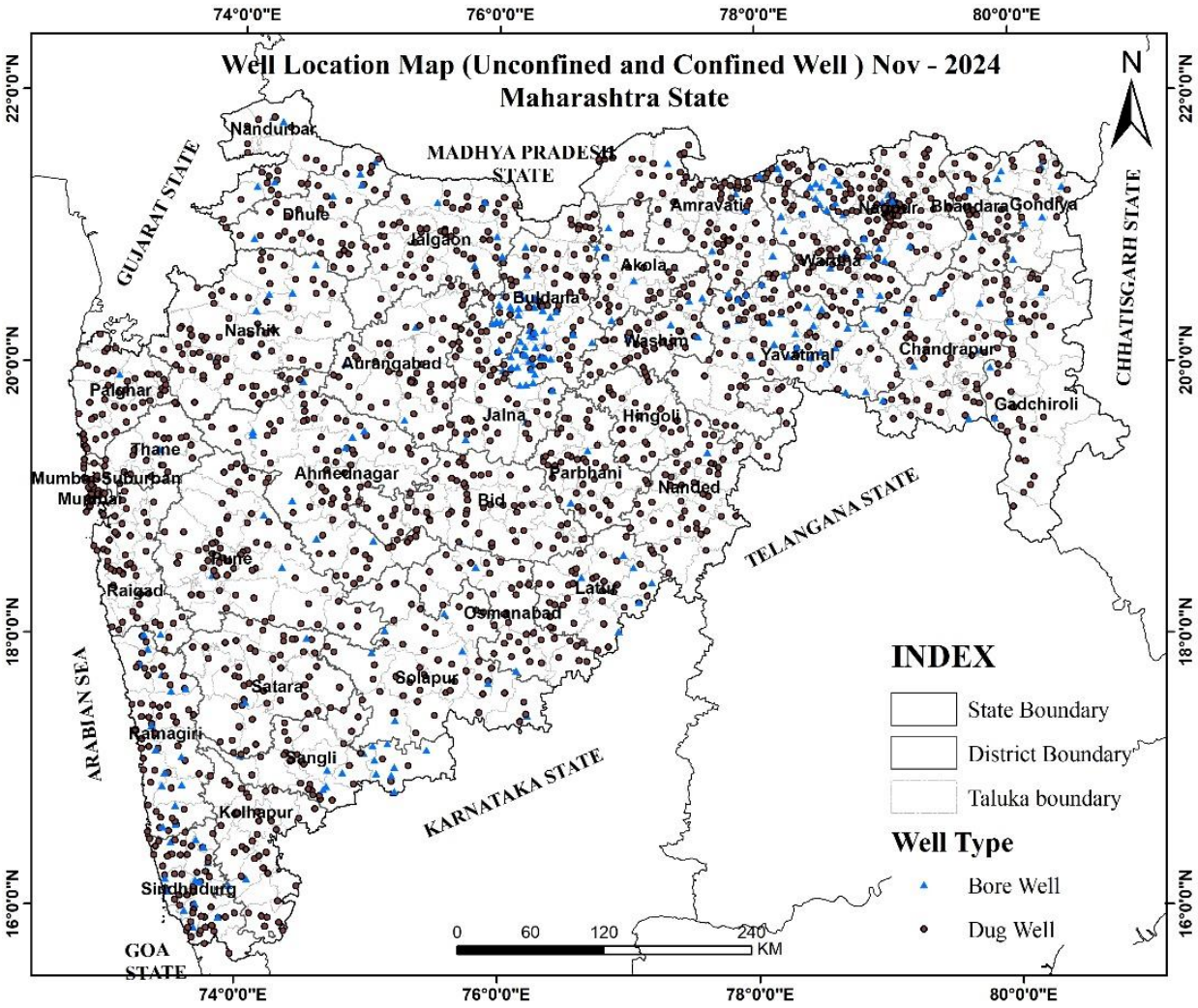


Fig. 2: Ground Water Monitoring Wells (GWMWs), Maharashtra.

4.0 RAINFALL

As per the IMD, the departure of monsoon rainfall from normal rainfall for the period from 1st June 2024 to 30th 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, 22 district received excess rainfall, Hingoli district received deficient rainfall and remaining 13 districts has received normal rainfall during this period.

Table 2: District wise departure of rainfall with respect to Normal rainfall (01-06-2024 to 30-09-2024)

S.No.	District	% Departure of Rainfall wrt Normal Rainfall	Category
1	Ahmednagar	49	Excess
2	Akola	13	Normal
3	Amravati	-2	Normal
4	Aurangabad	19	Normal
5	Beed	29	Excess
6	Bhandara	13	Normal
7	Buldhana	24	Excess
8	Chandrapur	14	Normal
9	Dhule	37	Excess
10	Gadchiroli	25	Excess
11	Gondia	8	Normal
12	Hingoli	-35	Deficient
13	Jalgaon	46	Excess
14	Jalna	31	Excess
15	Kolhapur	45	Excess
16	Latur	37	Excess
17	Mumbai	18	Normal
18	Mumbai Suburban	33	Excess
19	Nagpur	11	Normal
20	Nanded	15	Normal
21	Nandurbar	36	Excess
22	Nashik	44	Excess
23	Osmanabad	23	Excess
24	Palghar	32	Excess
25	Parbhani	32	Excess
26	Pune	43	Excess
27	Raigad	21	Excess
28	Ratnagiri	26	Excess
29	Sangli	48	Excess
30	Satara	15	Normal
31	Sindhudurg	40	Excess
32	Solapur	12	Normal

S.No.	District	% Departure of Rainfall wrt Normal Rainfall	Category
33	Thane	12	Normal
34	Wardha	29	Excess
35	Washim	16	Normal
36	Yavatmal	29	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)

The depth to water level data of 1921 wells is used for the analysis. Depth to water level in shallow unconfined aquifer ranges from near ground level 0.1 mbgl (Pune district) to 48.1 mbgl (Jalgaon district). Water level of less than 2 mbgl is recorded in 26% of wells, between 2 to 5 mbgl in 49% of wells, between 5 to 10 mbgl in 20 % of wells, between 10 to 20 mbgl in 4 % of wells and water level more than 20 mbgl is registered in 1 % of wells.

Water levels <2 mbgl are observed in 26% of wells covering about 64,629 sq km area covering major parts of Raigad, Thane, Pune, Palghar of Konkan region; Chandrapur and Gadchiroli districts of Vidarbha region and Nashik district of Khandesh region. Water levels between 2 and 5 mbgl covering an area of ~1,67,222 sq km are observed in 49% of wells covering major part of the state. About 20% of wells, covering an area of ~63,684 sq km show depth to water level between 5 to 10 mbgl. Depth to water levels in this range is observed in parts of the Vidarbha, Marathwada and Khandesh regions and parts of Ratnagiri and Sindudurg districts of Konkan region.

Deeper ground water levels ranging from 10 to 20 mbgl are observed in ~4% of wells covering ~10,697 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 in Ratnagiri, Sindudurg, Nashik, Parbhani and Ahmednagar districts. Depth to water levels of >20 mbgl (1 % wells), covering about 1304 sq. km area is observed in northern part of the state occupied by Tapi and Purna alluvium basin in parts of Jalgaon, Akola, Dhule and Amravati districts.

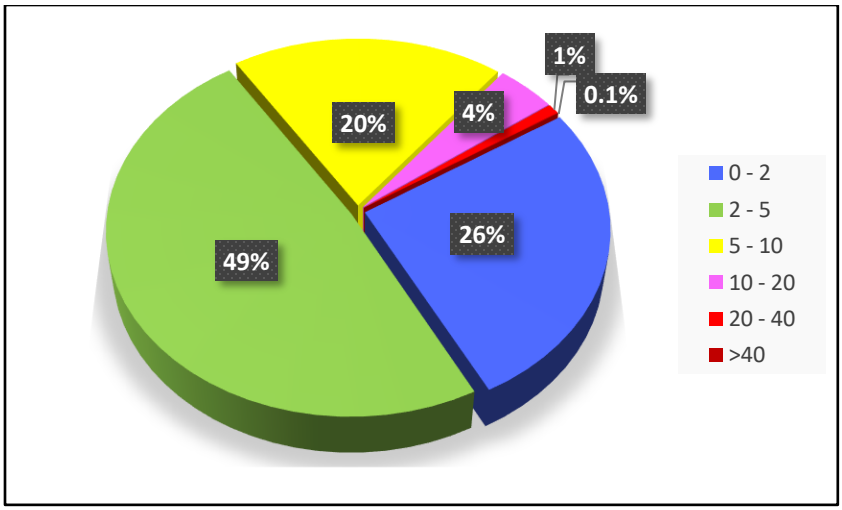


Fig. 3: Percentage of wells in different water level ranges in unconfined aquifer.

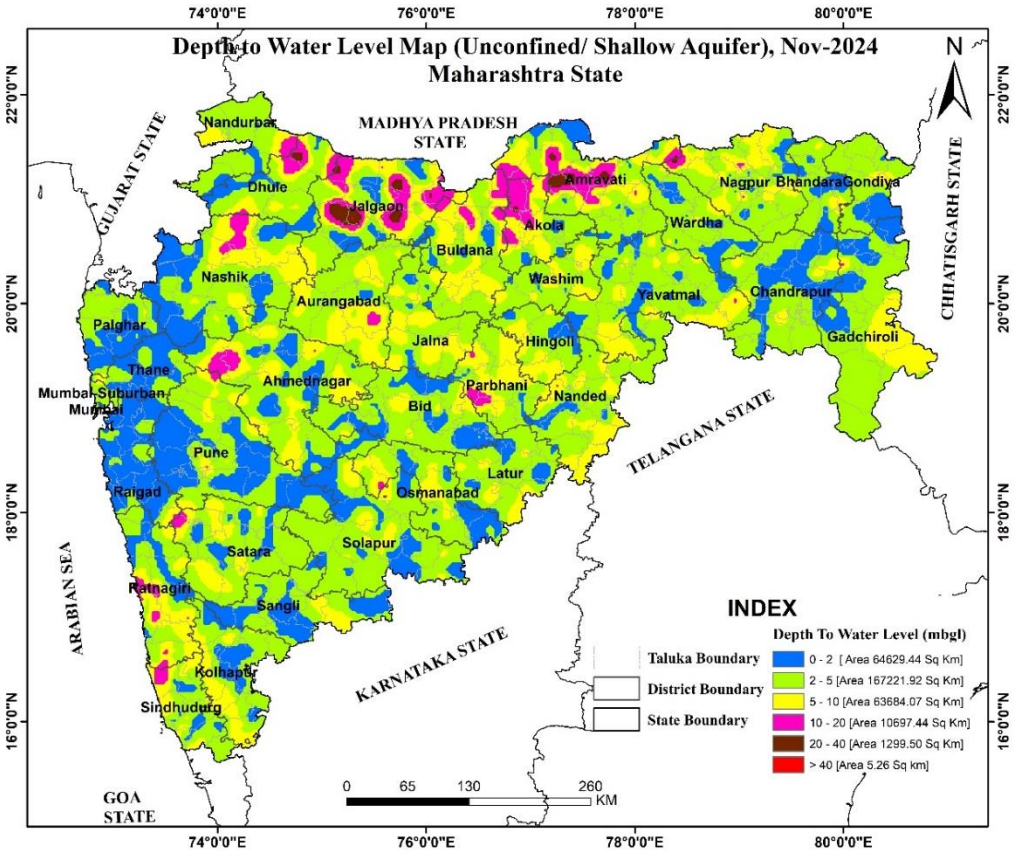


Fig. 4: Depth to Water Level of Unconfined Aquifer During November 2024

5.1.2 SEASONAL FLUCTUATION IN WATER LEVEL FLUCTUATION

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

Water Levels from 1896 station were compared with that of May 2024 to know the seasonal changes in ground water in November 2024. Out of the whole 93% of the wells have recorded a rise in water level and the remaining 7% of the wells have recorded a fall in water level.

Rise in Water Level:

The water levels have shown a general rise in the order of 0 to > 4 m in ~93% 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 41% of wells covering about 1,31,246 sq km area. It is observed in major parts of all districts of Marathwada and Khandesh regions and parts of Ahmednagar, Solapur, Sangli and Pune districts of Western Maharashtra region. The rise in water level up to 4 m was observed in 52% of wells covering an area of 1,71,290 sq km is observed in major parts of all the districts Konkan and Vidarbha regions and parts of Kolhapur, Satara, Sangli districts of Western Maharashtra region.

Fall in Water Level:

About 7% of the wells covering about 4464 sq km area show a decline in water level in the range of 0 to >4 m. Out of which 6% 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 isolated patches of Amravati, Akola, Wardha, Jalgaon, Pune, Kolhapur and Ahmednagar districts.

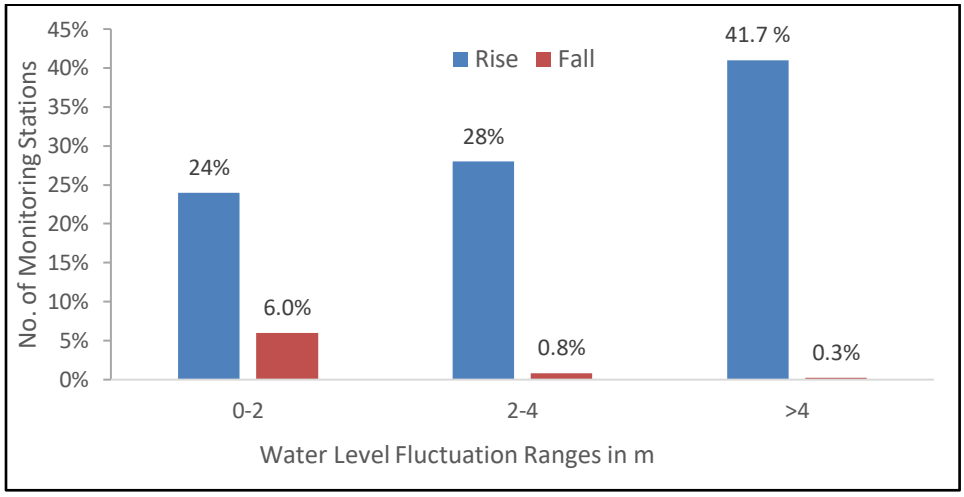


Fig. 5: Percentage of wells showing rise and fall in water level in unconfined aquifer. (May 2024 to November 2024)

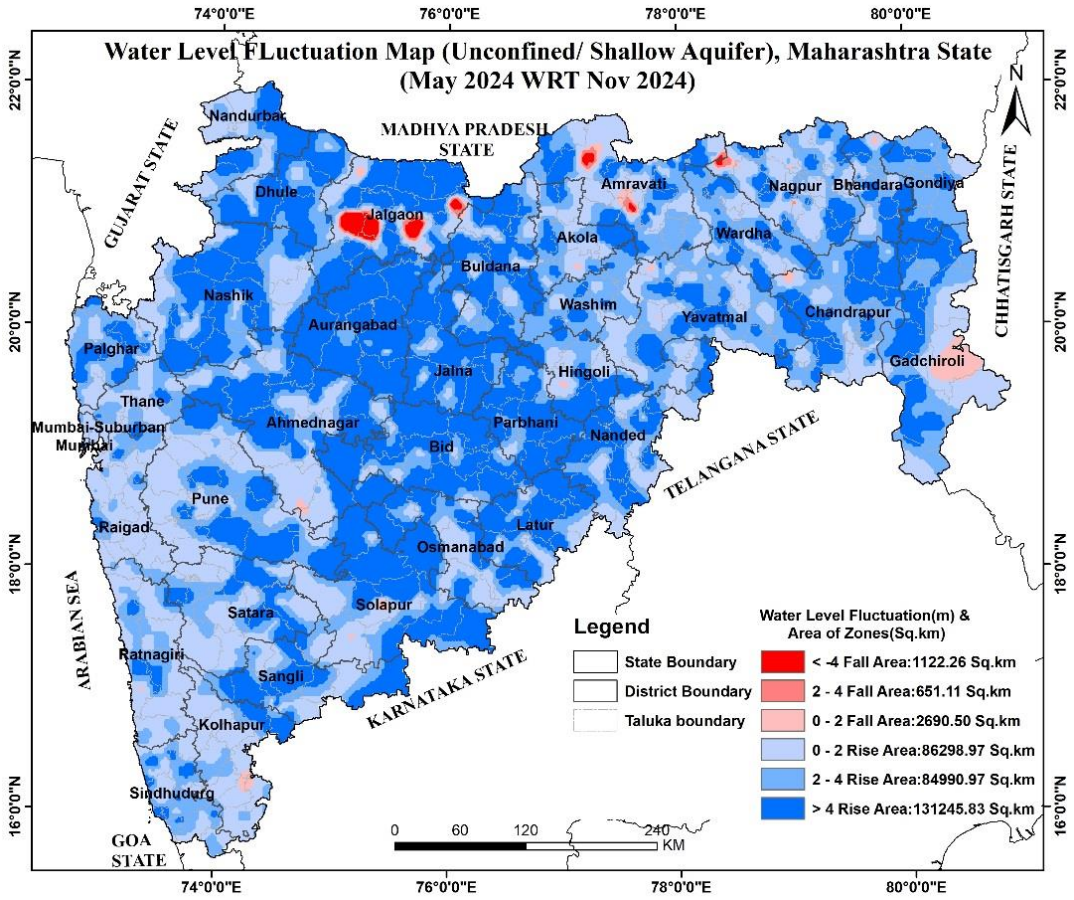


Fig. 6: Seasonal water level Fluctuation in unconfined aquifer. (May 2024 to November 2024)

5.1.3 ANNUAL FLUCTUATION IN WATER LEVEL FLUCTUATION

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

Water Levels from 1840 station were compared with that of November 2023 to know the annual changes in ground water in November 2024. Out of total, 73% of wells have recorded a rise in water level and the reanimating 26% of the wells have recorded a fall in water level. About 1% of the wells shows no fluctuation.

Rise in Water Level:

~ 73% 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 ~11% of wells covering ~30,890 sq km area in parts of all districts of Marathwada and Khandesh regions and parts of Ahmednagar, Solapur, Sangli and Pune districts of Western Maharashtra region. The rise in water level up to 4 m covering an area of ~2,63,930 sq km is observed in major parts of all the districts Maharashtra State.

Fall in Water Level:

About 26 % of the wells covering about 12,319 sq km area in Maharashtra show a decline in water level in the range of 0 to >4 m. Out of which 21% of the wells show 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 upto 4 m covering an area of about 11,109 sq km is observed in isolated parts of Jalgaon, Amravati, Hingoli, Wardha, Nagpur, Nanded and Kolhapur district. Significant decline in water levels >4m has been observed in isolated small parts of Jalgaon and Amravati districts covering 1210 sq km.

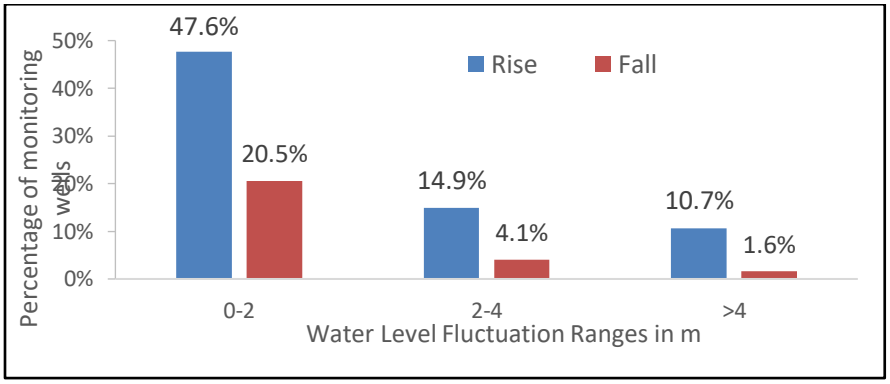


Fig. 7: Percentage of wells showing rise and fall in water level in unconfined aquifer.
(November 2023 to November 2024)

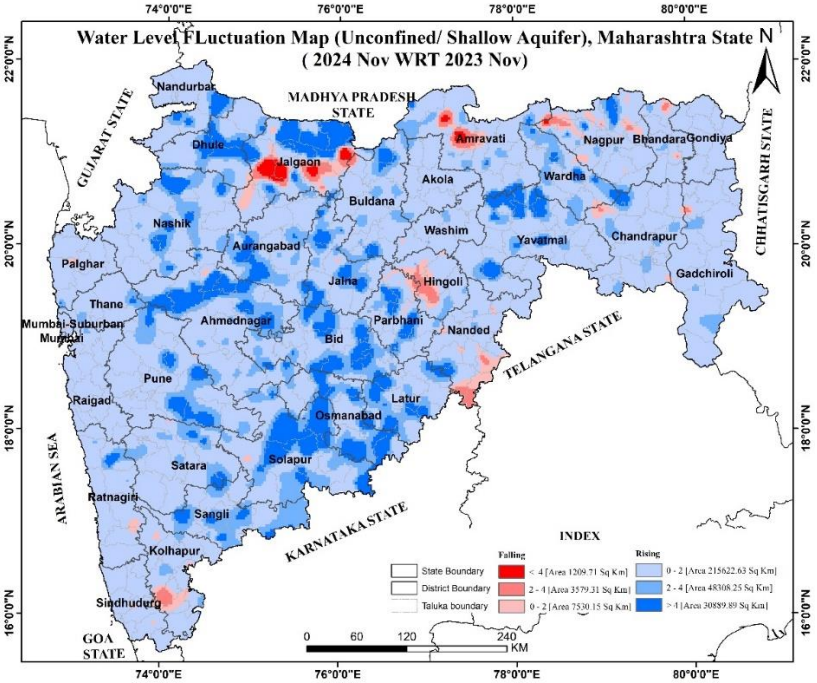


Fig. 8: Annual water level Fluctuation in unconfined aquifer.
(November 2023 to November 2024)

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

Water Levels from 1646 station were compared with that of November 2022 to know the annual changes in ground water in November 2024. Out of the total, 57% of the wells have recorded a rise in water level and the remaining 42% of the wells have recorded a fall in water level. About 1% of the wells show no fluctuation.

Rise in Water Level:

Rise water level of less than 2 m is recorded in 46 % wells, 2 to 4 m in 7% wells and more than 4 m in 4% of the wells. Rise in water level less than 2 m is observed in major part of the state covering 1,59,736 sq km whereas rise in water level between 2m to >4 m has been observed in parts of Nandurbar, Dhule, Jalgaon, Parbhani and Nanded districts and isolated parts of almost all the districts except Mumbai and Raigad districts.

Fall in Water Level:

Fall in water level of less than 2 m is recorded in 31 % wells, 2 to 4 m in 7% wells and more than 4 m in 3% of the wells. Fall in water Level less than 2 m is observed 1,04,927 sq km covering in parts of Marathwada, Western Maharashtra and Vidarbha region whereas fall in Water level between 2 to 4 m and >4 m is observed in isolated parts of almost all the districts of the state except Akola, Mumbai city and Wardha districts covering an area of 16,722 sq km.

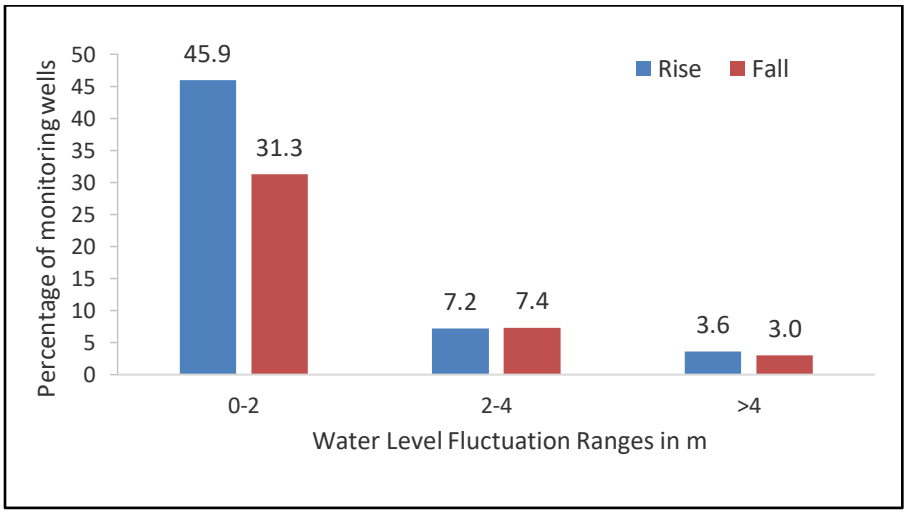


Fig. 9: Percentage of wells showing rise and fall in water level in unconfined aquifer.
(November 2022 to November 2024)

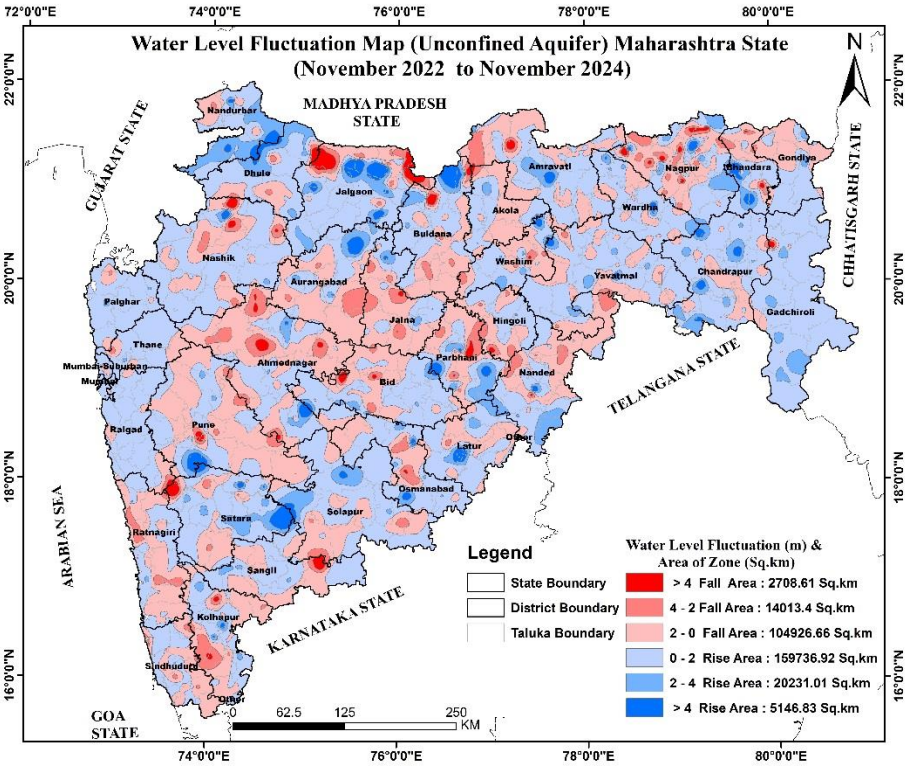


Fig. 10: Annual water level Fluctuation in unconfined aquifer. (November 2022 to November 2024)

5.1.4 DECADAL FLUCTUATION IN WATER LEVEL

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

Mean ground water levels for the period of Nov. 2014-23 was compared with the Ground water level of November 2024. It is observed that, out of 1902 stations compared, 1441 stations accounting for 76% have shown rise in water level and 456 stations accounting for 24% have shown fall in water level. ~1% (0.26%) has shown no fluctuation.

Rise in Water Level:

Rise in water level of less than 2 m is recorded in 52 % wells, 2 to 4m in 17 % wells and more than 4 m in 7% of the wells. Rise in water Level <2 m is observed in major part of the state covering 1,93,063 sq km whereas rise in water level between 2-4 and >4 m has been observed in isolated parts of almost all the districts except Mumbai city, Mumbai sub urban and Raigad districts covering an area of 66,995 sq km.

Fall in Water Level:

Fall in water level of less than 2 m is recorded in 21% wells, 2 to 4 m in 2% wells and more than 4 m in 1% of the wells. Fall in water Level <2 m is observed covering 43,570 sq km in almost all parts of the districts of Konkan, Marathwada and Vidarbha region. Fall in Water level between 2 to 4 m and

>4 m is observed in isolated parts of Nagpur, Bhandara, Gondia, Parbhani, Hingoli, Nanded, Kolhapur, Jalgaon, Ratnagiri and Nashik districts covering an area of 3115 sq km.

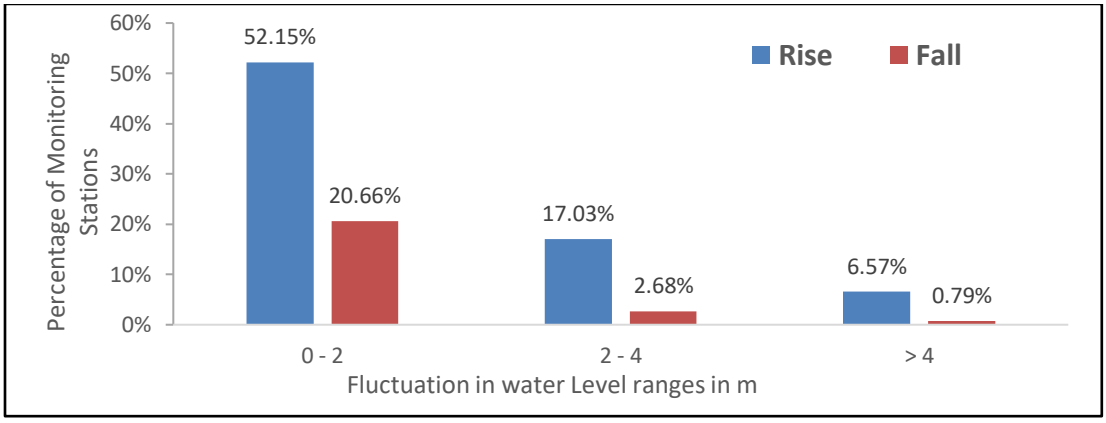


Fig.-11: Percentage of wells showing rise and fall in WL in unconfined Aquifer (Decadal Mean November (2014 -2023) to November 2024)

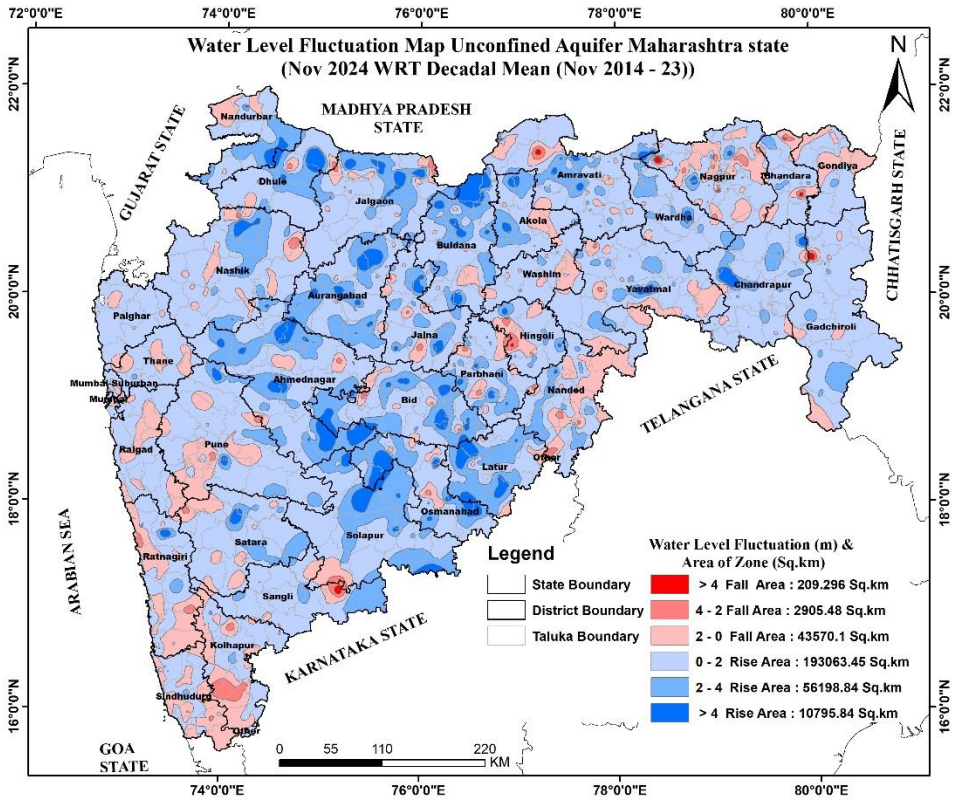


Fig.-12: Decadal Water level fluctuation in unconfined aquifer (Decadal Mean November (2014 -2023) to November 2024)

5.2 DEEPER AQUIFER (CONFINED/ SEMI-CONFINED)

5.2.1 DEPTH TO PIEZOMETRIC LEVEL

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

Analysis of piezometric level data of 179 wells shows piezometric level varies between 0.01 mbgl (Dasmegaon, Dharashiv district) to 182.95 mbgl (Kosumb, Ratnagiri district). Piezometric level of less than 2 mbgl is recorded in 16% of wells, between 2 to 5 mbgl in 27%, between 5 to 10 mbgl 30%, between 10 to 20 mbgl in 15%, between 20-40 mbgl in 5%, more than 40% is recorded in 7% of wells.

Shallow piezometric level of less than 2mbgl is noticed in isolated patches of Nagpur, Buldhana, Chandrapur, Yavatmal, Osmanabad, Pune, Ratnagiri and Nashik districts covering 16% area of state. Piezometric level between 2 to 5 mbgl is observed in major part of the state covering 27% area of the state. Piezometric level between 5 to 10 mbgl is observed mainly in eastern and northern part of the state covering 30% in parts of Ahmednagar, Buldhana, Jalgaon, Nagpur, Jalna, Parbhani, Gondia, Ratnagiri, Sangli, Sindudurg and Solapur districts. Piezometric level between 10 to 20 mbgl covering 15% of the area mainly in parts of Buldhana, Ratnagiri, Sindudurg, Sangli and Solapur districts. Deeper Piezometric level >20 mbgl is observed mainly in parts of Ratnagiri, Sindudurg, Kolhapur, Dhule, Satara, Sangli, Solapur districts covering 12% area of the state.

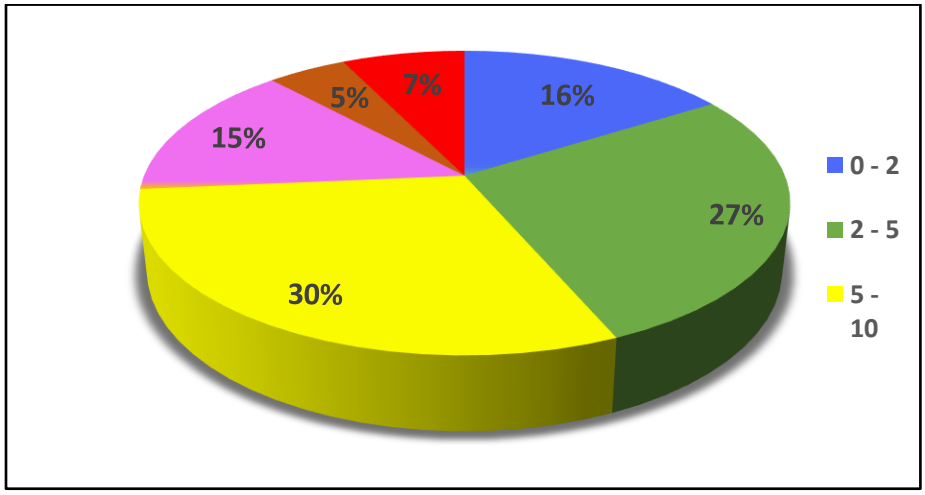


Fig 13: Percentage of wells in different Piezometric Level (November 2024).

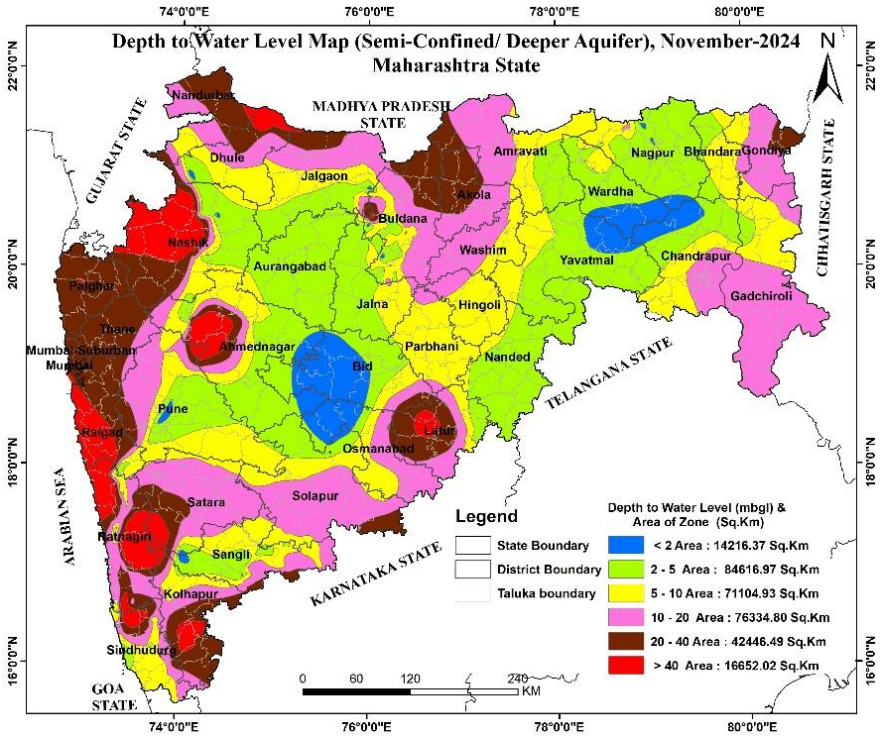


Fig 14: Depth to Piezometric Level in deeper Aquifer in November 2024.

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 Water Level:

Out of 173 wells analysed, 159 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 16 % wells, 2 to 4 m in 23 % wells and more than 4 m in 53 % of the wells. Piezometric level rise of less than 2 m is seen in all the districts, significantly in Buldhana, Ratnagiri, Sindudurg and Sangli districts. Piezometric level of 2 to 4 m is observed mainly in districts such as Buldhana, Nagpur, Ratnagiri and Sindudurg districts. Piezometric level rise of more than 4 m is significantly observed in Buldhana, Sangli, Nagpur, Dhule, Jalgaon, Ahmednagar, Ratnagiri, Sangli, Sindudurg, Solapur, Nandurbar, Latur and Yavatmal districts.

Fall in Water Level:

Out of 173 wells analysed, 14 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 6 % wells,

2 to 4 m in 1 % wells and more than 4 m in 2% of the wells. Fall of less than 2 m is mainly observed in isolated parts of Buldhana, Ahmednagar, Gondia, Nagpur, Osmanabad, Ratnagiri and Sindudurg districts. Fall of 2 to 4 m is observed as isolated patch of only in the district of Akola district and Fall >4 m is observed as isolated patches in Ahmednagar, Ratnagiri, Sangli districts.

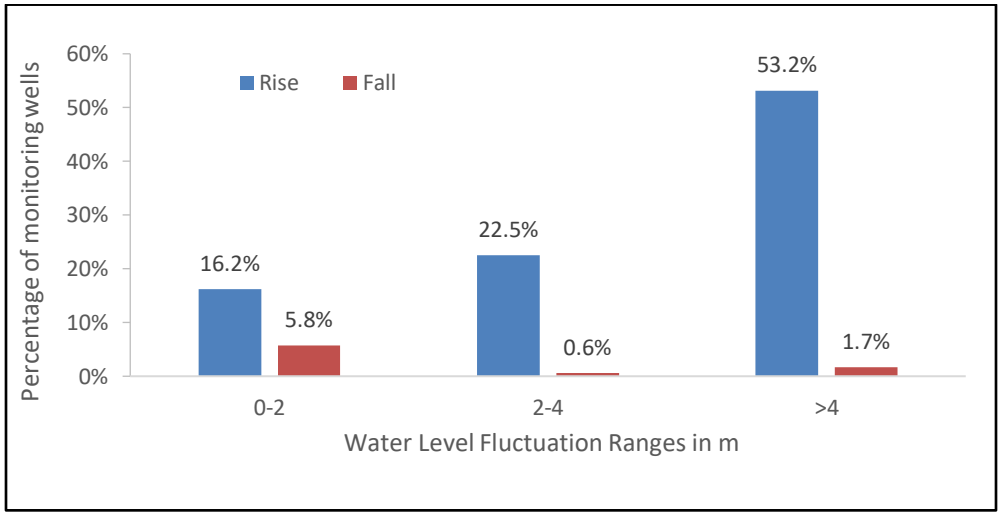


Fig 15: Percentage of Wells showing rise and fall in Piezometric level in confined/Semi -Confined Aquifer (May 2024 to November 2024)

5.2.3 ANNUAL FLUCTUATION IN PIEZOMETRIC LEVEL

Annual Fluctuation of Piezometric level in Confined/Semi Confined Aquifer (November 23 to November 2024)

Rise in Water Level:

Out of 128 Wells analysed, 91 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 36 % wells, 2 to 4 m in 16% wells and more than 4 m in 19% of the wells. Piezometric level rise of less than 2 m is seen in almost all the districts, significantly in Buldhana, Ratnagiri, Sindudurg, Gondia, Jalgaon, Kolhapur and Nashik districts. Piezometric level of 2 to 4 m is observed mainly in parts of Buldhana, Ahmednagar, Dhule and Solapur districts. Piezometric level rise of more than 4 m is observed mainly in parts of Buldhana, Ahmednagar, Nashik, Dhule, Latur and Ratnagiri districts.

Fall in Water Level:

Out of 128 Wells analysed, 37 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 21% wells, 2 to 4 m in 2% wells and more than 4 m in 6% of the wells. Fall of less than

2 m is mainly observed mainly in parts of Buldhana, Ratnagiri and Sindudurg districts. Fall of 2 to 4 m is observed in isolated parts of Nandurbar and Ratnagiri districts. Fall >4 m is observed in parts of Ratnagiri, Ahmednagar, Buldhana, Gadchiroli, Latur, Solapur and Nashik districts.

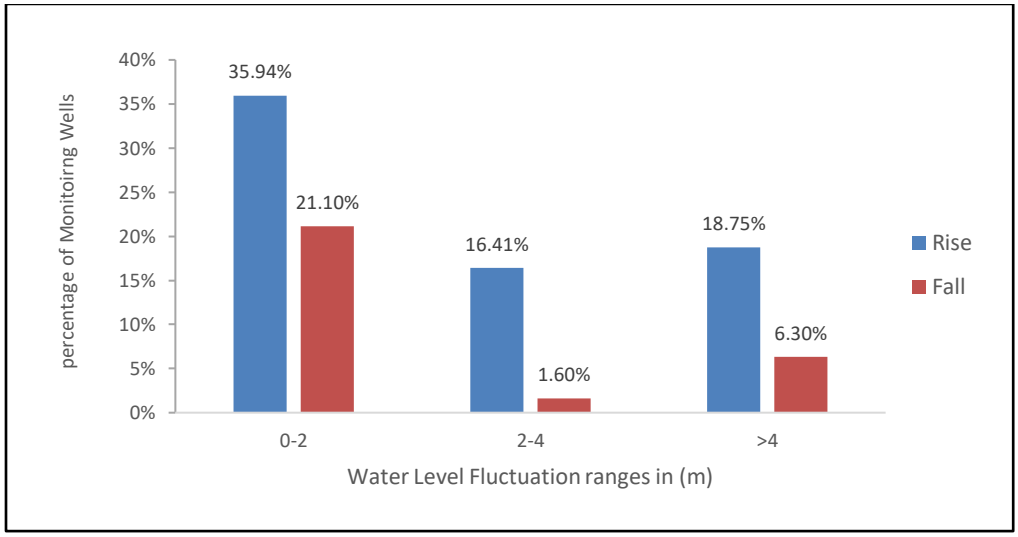


Fig 16: Percentage of Wells showing rise and fall in Piezometric level in confined/Semi -Confined Aquifer (November 2023 to November 2024)

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

Rise in Water Level:

Out of 57 Wells analysed, 29 wells show fall 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 12 % wells and more than 4 m in 5% of the wells. Piezometric level rise of less than 2 m is seen in almost all the districts, significantly in Ahmednagar, Chandrapur and Solapur districts. Piezometric level of 2 to 4m is observed in parts of Nandurbar, Dhule, Amravati, Buldhana, Chandrapur, Gadchiroli and Latur districts. Piezometric level rise of more than 4 m is observed in parts of Jalgaon, Dhule and Chandrapur districts.

Fall in Water Level:

Out of 57 Wells analysed, 28 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 25% wells, 2 to 4 m in 9% wells and more than 4 m in 16 % of the wells. Fall of less than

2 m is observed in parts of Ahmednagar, Nashik, Dhule, Gondia, Yavatmal, Gadchiroli, Pune, Raigad, Osmanabad, Satara and Solapur districts. Fall of 2 to 4 m is observed in isolated parts of Ahmednagar, Nagpur, Gondia and Parbhani districts. Fall >4 m is observed in parts of Solapur, Kolhapur, Ahmednagar, Gondia, Nashik, Ratnagiri and Latur districts.

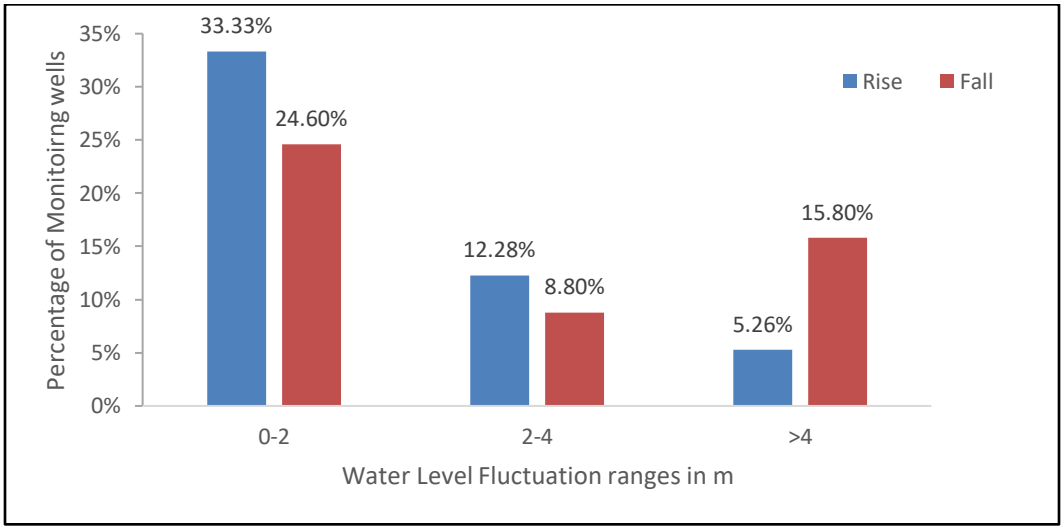


Fig 17: Percentage of Wells showing rise and fall in Piezometric level in confined/Semi -Confined Aquifer (November 2022 to November 2024)

5.2.4 DECADAL FLUCTUATION IN WATER LEVEL

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

Rise in Water Level:

Out of 131 Wells analysed, 92 wells show fall 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 36 % wells, 2 to 4 m in 13 % wells and more than 4 m in 21 % of the wells. Piezometric level rise of less than 2 m is seen in almost all the districts, significantly in Buldhana, Chandrapur, Ratnagiri, Sindudurg, Gondia, Jalgaon, Pune, Kolhapur, Solapur and Nashik districts. Piezometric level of 2 to 4 m is observed mainly in parts of Buldhana, Nandurbar and Solapur districts. Piezometric level rise of more than 4 m is observed mainly in parts of Buldhana, Ahmednagar, Dhule, Nashik, Latur, Solapur, Ratnagiri and Sindhudurg districts.

Fall in Water Level:

Out of 131 Wells analysed, 39 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 19 % wells, 2 to 4 m in 2% wells and more than 4 m in 8% of the wells. Fall of less than 2 m is mainly observed in parts of Buldhana, Ratnagiri and Sindudurg, districts. Fall of 2 to 4 m is observed in isolated parts of Ahmednagar and Ratnagiri districts. Fall >4 m is observed in parts of Kolhapur, Ratnagiri, Solapur, Ahmednagar, Buldhana, Gondia, Gadchiroli, Nashik, Ratnagiri and Latur districts.

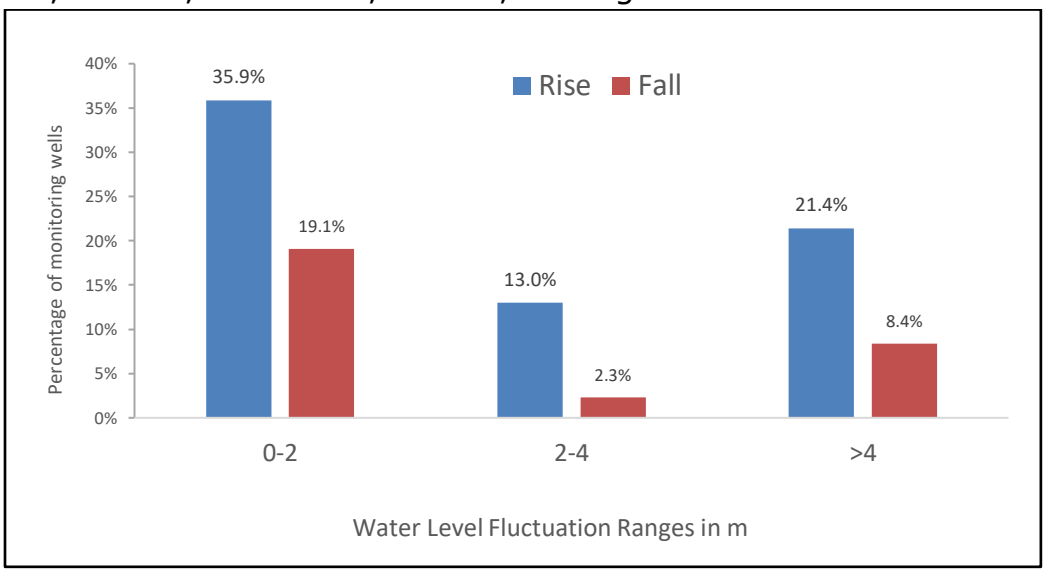


Fig 18: Percentage of Wells showing rise and fall in Piezometric level in confined/Semi -Confined Aquifer (Decadal mean November (2013-22) to November 2023)

6.0 SUMMARY

The groundwater levels in the state are monitored through a network of 2175 wells during four times a year: August, November, January and May and this report evaluates groundwater levels during post-monsoon season of 2024 (November).

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 0.1 to 48.1 m bgl and the more predominate water level range is 2-5 m, which occupies about 1,67,222 sq.km of states geographical area

and in 49% of wells. Shallowest levels were observed in Pune district, while the deepest in Jalgaon district. In most of coastal region, water levels are very shallow (0-2 m and 2-5 m bgl). In northern part, deeper water levels (>10 m) are observed.

- The season fluctuations in water levels during November-24 with respect to May-24 shows that in 93% of wells have shown fall in water levels covering the districts of almost all the districts of the state. In rest of wells falling mostly in Amravati, Akola, Wardha, Jalgaon, Pune, Kholapur and Ahmednagar districts.
- The annual fluctuations during November-24 WRT to November-23, 73% 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 26 % of wells. The rise is mostly occurred in major parts of all the districts of state and fall in isolated parts of Jalgaon, Amravati districts of state.
- The annual fluctuations during November-24 WRT to November-22, shows 57% rise in water levels in the range of 0-2,2-4 and > 4 m and 42% of wells fall in water levels. Rise is mostly observed in almost all the districts except Mumbai & Raigard distrcts and fall in isolated parts of Vidharbha and Marathwada region.
- The decadal fluctuations in water levels during November-24 with respect to last decade (2014-23) of the same season shows rise in 76% of wells, covering 260057 sq. km of states' geographical area. Maximum rise is observed in major parts of all the districts of state. Fall in water levels is observed in 24 % of wells and significant Decline of > 4 m is observed in isolated parts of Nagpur, Bhandara, Gondia, Parbhani, Hingoli, Nanded, Kolhapur, Jalgaon, Ratnagiri and Nashik districts covering an area of 3115 sq km.

Confined/Semi-confined Aquifer (Deeper Aquifer):

- In deeper aquifers (confined/semi-confined) water levels are in the range of 0.01 to 182.95 m bgl, shallowest in Dharashiv and deepest in Kosumb district.
- The season fluctuations in water levels during November-24 with respect to May-24 shows that in 92 % of wells have shown rise in water levels.
- The annual fluctuations during November-24 WRT to November-23, shows rise in water levels in the range of 0-2,2-4 and > 4 m in 71 % of wells and fall in water levels is observed in about 29 % of wells.

- The annual fluctuations during November-24 WRT to November-22, shows rise in water levels in the range of 0-2,2-4 and > 4 m in 50 % of wells and fall in water levels is observed in about 50 % of wells.
- The decadal fluctuations during November-24 WRT to November-2014-23, shows rise in water levels in the range of 0-2,2-4 and > 4 m in 71 % of wells and fall in water levels is observed in about 29 % of wells.