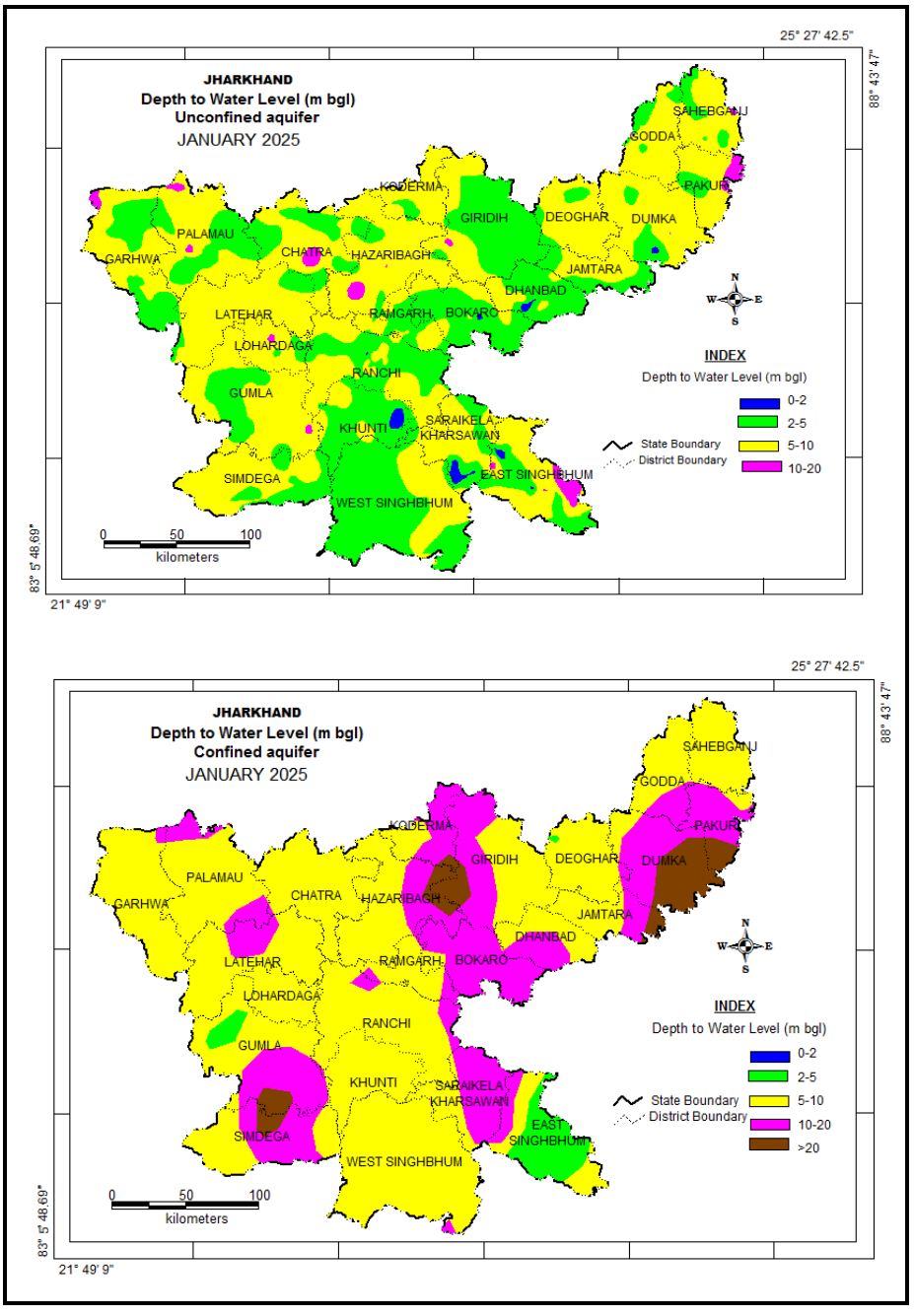
GROUND WATER LEVEL BULLETIN

January 2025



State Unit Office
Jharkhand
March 2025

GROUND WATER LEVEL BULLETIN

January 2025

JHARKHAND

1.0 INTRODUCTION

Groundwater bulletin is prepared by CGWB depicting changes in groundwater regime of the country through different seasons. It is an effort to obtain information on groundwater levels through representative monitoring wells. The important attributes of groundwater regime monitoring are groundwater level.

The natural conditions affecting the groundwater regime involve climatic parameters like rainfall, evapotranspiration etc., whereas anthropogenic influences include pumpage from the aquifer, recharge due to irrigation systems and other practices like waste disposal etc.

Groundwater levels are being measured by Central Ground Water Board four times a year during January, March/April/May, August and November. The regime monitoring started in the year 1969 by Central Groundwater Board. A network of 25437 observation wells called National Hydrograph Network Stations (NHNS), as on 30.04.2024, located all over the country is being monitored.

2.0 STUDY AREA

Jharkhand state, was created on 15th November, 2000, consists of districts falling on Chotanagpur Plateau of erstwhile Bihar on the birthday of legendary tribal freedom fighter Birsa Munda. Presently it consists of 24 districts and 260 administrative blocks. The capital of the state is Ranchi. The state spreads over 79714 sq km, between Latitude 21º 55' 00" and 25º 15' 00" and Longitude 83º 15' 00"and 87º 55' 00". The state is bounded by Bihar in the north and by West Bengal in the east. The other two sides, west and south, are bounded by Chhattisgarh and Orissa states respectively (Figure.1).

The population of the state as per 2011 census is 03.30 crore. The population density is 414 person/km^2. The urban population is 7.912 million and the rural population is 25.05 million. The tribal population constitutes about 28% of total population. The state is moderately urbanized with Ranchi as its capital city. Nearly 24% of total population

of the state lives in urban areas. Important urban centers are in the state are Jamshedpur, Dhanbad, Hazaribagh, Daltonganj, Dumka and Deoghar.

Fig 1: Administrative Map of Jharkhand

3.0 GROUND WATER LEVEL MONITORING

Central Ground Water Board, State Unit Office Ranchi, is monitoring changes in groundwater regime in Jharkhand 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 March 2024 was 582 which include 460 dug wells and 122 piezometers (**Figure 2**). In August 2024, 562 wells monitored (458 DW, 104 Pz, out of which 49 wells were dry), while 25 wells (9 dug wells and 16 piezometers) could not be monitored due to various reasons like inaccessibility, filled up, installation of pump units, road damaged, gate locked, etc. . The district-wise breakup of the water level monitoring stations is given in **Table-1**.

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

Sl.No	District	DW	PZ	TOTAL
1	Bokaro	16	1	17
2	Chatra	17	4	21
3	Deoghar	11	5	16
4	Dhanbad	20	4	24
5	Dumka	17	7	24
6	E. Singhbhum	36	3	39
7	Garhwa	23	8	31
8	Giridih	18	4	22
9	Godda	19	3	22
10	Gumla	17	3	20
11	Hazaribagh	28	10	38
12	Jamtara	11	5	16
13	Khunti	14	6	20
14	Koderma	7	6	13
15	Latehar	12	6	18
16	Lohardaga	12	2	14
17	Pakur	11	4	15
18	Palamu	25	7	32
19	Ramgarh	17	6	23
20	Ranchi	56	12	68
21	Sahibganj	21	3	24
22	Saraikela	14	1	15
23	Simdega	14	7	21
24	W Singhbhum	24	5	29
Total		**460**	**122**	**582**

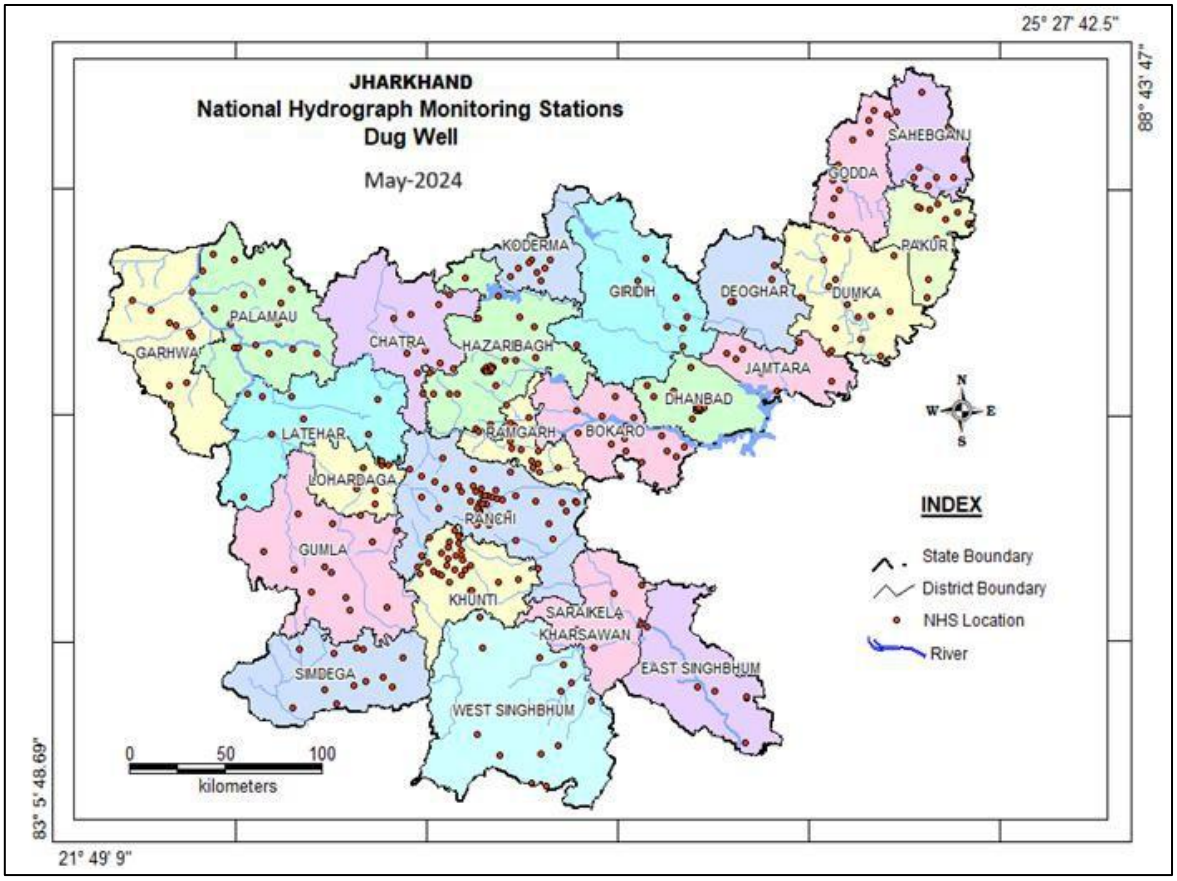


Figure-2: Map showing location of National Hydrograph Monitoring Stations of Jharkhand

4.0 RAINFALL

The amount and distribution of rainfall have a strong bearing on the state economy, as the agricultural activity is mainly dependent on rainfall. In addition, rainfall is the main source of ground water recharge in the entire state. The annual normal rainfall for the state is 1301 mm. District-wise; it ranges from 1528 mm at Pakur to 1084.1 mm at Godda. District wise distribution of normal annual rainfall is given in Table 2. The analysis of isohyets of mean annual rainfall indicates that in major part of the state, the rainfall remains between 1200 and 1400 mm/year. Major part of the annual downpour is from the south-western monsoon, which sets in the second week of June. This monsoon rainfall accounts for about 83% of the total annual rainfall of the state. District wise percentage of monsoon rainfall ranges from 79.13% in Dumka to as

high as 87.98% at Chatra. Annual Normal Rainfall (cm) of Jharkhand State is showing in Figure-3

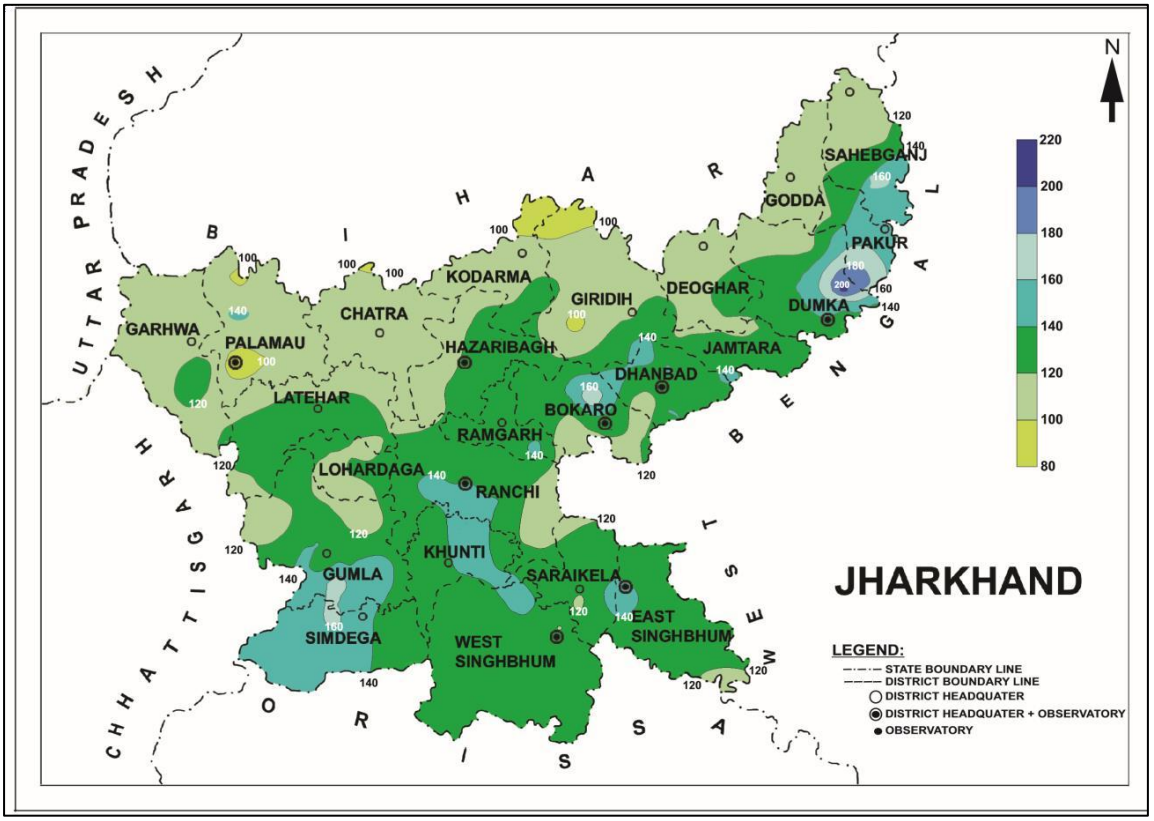


Figure-3: Annual Normal Rainfall (cm) of Jharkhand State

Table-2: District-wise Normal Rainfall of Jharkhand State

Sl. No.	Name of the Districts	Normal Annual Rainfall (mm)	Normal Monsoon Rainfall (mm)
1.	Bokaro	1259.6	1040.2
2.	Chatra	1206.3	1061.3
3.	Deoghar	1220.7	993.3
4.	Dhanbad	1295.6	1074.7
5.	Dumka	1422.5	1125.6
6.	East Singhbhum	1403.4	1136.4
7.	Garhwa	1210.3	1047.7

8.	Giridih	1215.6	1024.2
9.	Godda	1084.1	883.6
10.	Gumla	1460.9	1208.5
11.	Hazaribagh	1251.2	1040.5
12.	Jamtara	1447.4	1182.5
13.	Khunti	1323.2	1086.4
14.	Koderma	1115.9	940.7
15.	Latehar	1237.2	1061.3
16.	Lohardaga	1194.3	985.3
17.	Pakur	1528.0	1215.3
18.	Palamau	1169.4	1014.5
19.	Ramgarh	1251.2	1040.5
20.	Ranchi	1323.2	1086.4
21.	Sahebganj	1410.6	1153.9
22.	Saraikela	1307.6	1068.7
23.	Simdega	1506.5	1317.0
24.	West Singhbhum	1351.6	

5.0 GROUND WATER LEVEL SCENARIO

5.1 UNCONFINED AQUIFER

5.1.1 Depth to Water Level January 2025

Depth to Water Level in Unconfined Aquifer (January 2025)

The map of depth to water level of January 2025 (Figure-5), with respect to Jharkhand state, based on data for unconfined aquifers reveals that the depth to water level between 0-2 m found in limited areas including parts of Khunti, Saraikela Kharsawan, Dhanbad, E.Singhbhum, Bokaro, Dumka and patches in Ranchi district. Depth to water level within range of 2-5 m observed in major parts of Giridih, Dhanbad, Bokaro, Khunti, West Singhbhum, Ramgarh, Garhwa , Palamu district and smaller parts of Simdega , Godda , Pakur district. Major part of the state showing depth to water level within range

of 5-10 m covering the maximum area of Hazaribagh, Laterhar, Lohardaga, Deoghar, Godda, Dumka district. and some smaller parts of Giridih, W.Singhbhum. Depth to water level within range of 10-20 m covering small parts of Pakur, Chatra, Hazaribagh, E. Singhbhum district and some smaller patches in area of Palamu, Lohardaga, Giridih district.. The deeper water level maybe due to temporal heavy ground water withdrawal and pumping effect near to observation wells.

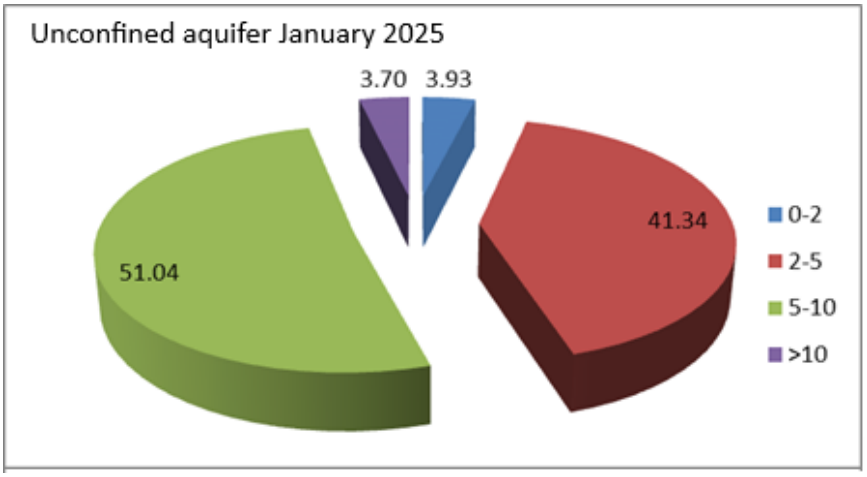


Figure 4- percentage of wells in different water level ranges in unconfined aquifer

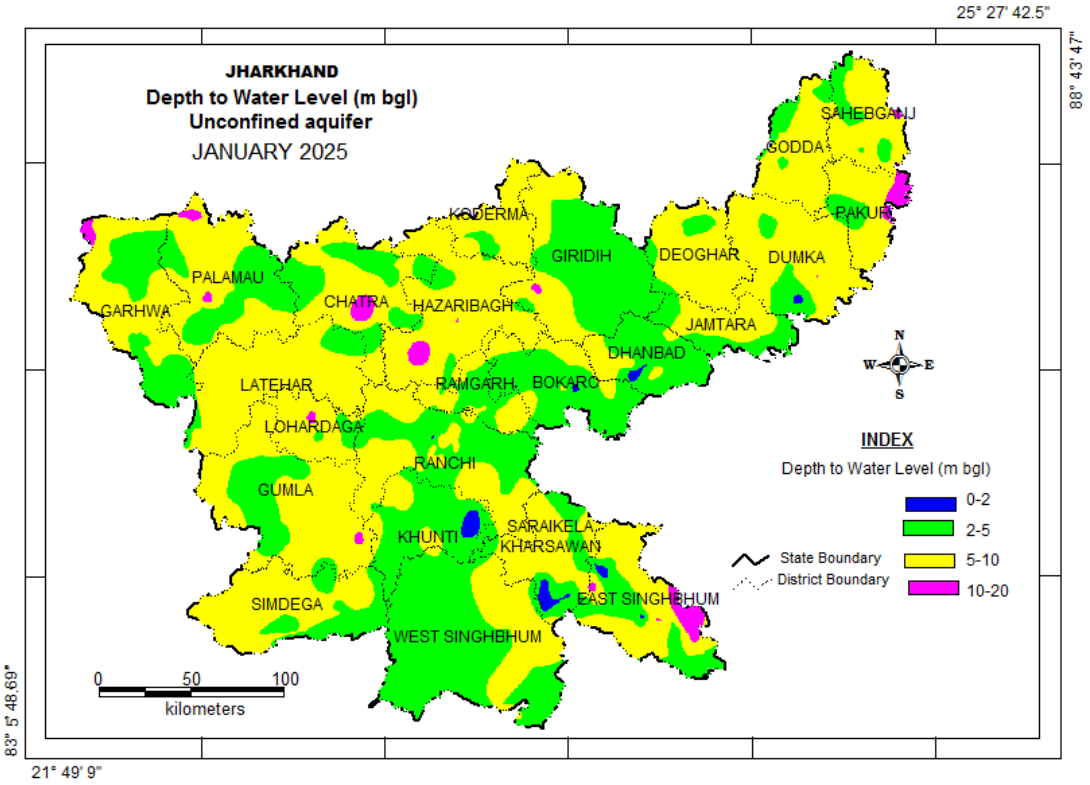


Figure 5- (January- 2025) Depth to water level map of Jharkhand

5.1.2 SEASONAL FLUCTUATION IN WATER LEVEL

Seasonal Fluctuation of Water Level in Unconfined Aquifer (May/Pre-monsoon 2024 to January 2025)

In general major area of Jharkhand state shows rise in water level in comparison with depth to water level of January 2025 with respect to May 2024. (Figure-7)

Rise in Water Levels

Major part of the state showing water level rise within the range of 0-2 m covering the maximum part of Gumla, Latehar, Simdega, Garhwa Dumka, Godda, Sahebganj, E Singhbhum, W singhbhum and Saraikela Kharsawan district, some parts of Khunti, Ranchi, Hazaribagh, Palamu, Deoghar Pakur, Ramgarh and some other smaller patches over the state. Water level rise within range of 2-4 m has been observed in major part of Giridih, Bokaro, Dhanbad, Jamtara, Palamu, Ranchi dsitrict some parts of Garhwa, E singhbhum, Sahebganj, Deoghar and Dumka district, and some other smaller patches. Rise in water level more than 4 m observed in small patches in Palamu, Garhwa, Giridih, Bokaro, Ranchi, Dhanbad, Deoghar and Latehar district.

Fall in Water Levels:

A small part of Jharkhand state shows fall in water level when it's compared with January 2025 with respect to May 2024. 0 to 2 m fall in water level observed in small part of Chatra, Gumla, Palamu, Simdega, Garhwa, Pakur Sahebganj, Dumka district and some other parts of the state. 2- 4 m fall of water level observed in Simdega, Chatra, E singhbhum and some other small parts of the state. More than 4 m water level fall shows only in one small part of Sahebganj district.

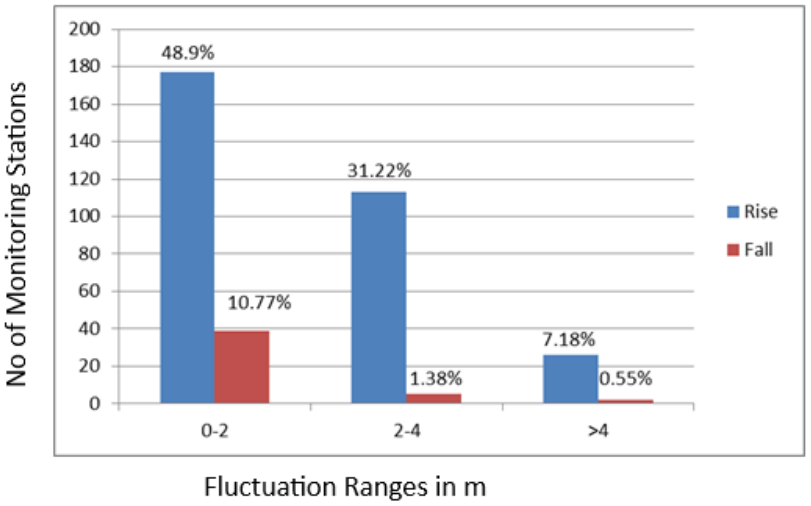


Figure 6: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt May 2024)

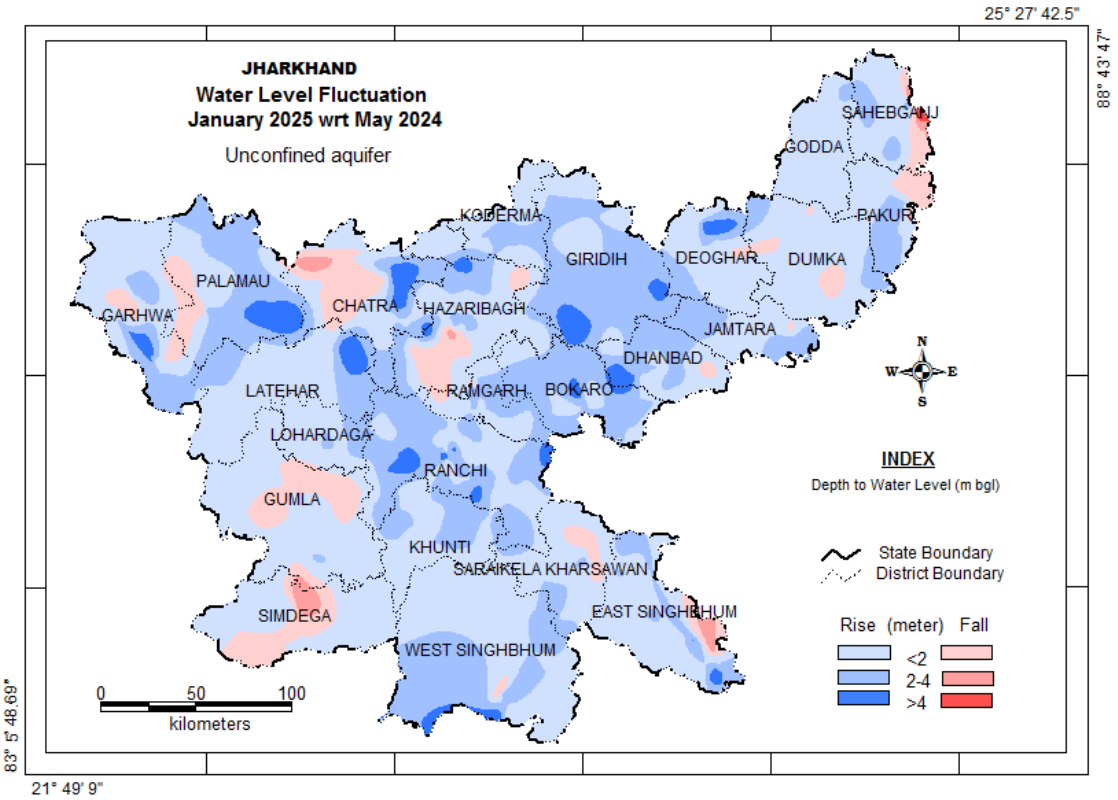


Figure 7: Water level fluctuation in unconfined Aquifer (May 2024 to January 2025)

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

Major area of Jharkhand state shows rise in water level when it's compared with January 2025 with respect to August 2024 depth to water level. (Figure-9)

Rise in Water Levels

Water level rise within the range of 0-2 m is observed in parts of Giridih, Bokaro, Dhanbad, W.Singhbhum, Ramgarh, Jamtara and also some patches covering part of Koderma, Garhwa, Sahebganj, Gumla, Godda district. Water level rise within range of 2-4 m, covers part of Godda, Sahebganj, Deoghar, Garhwa, Koderma district and smaller areas of Pakur, Lohardaga, Dhanbad and Bokaro district. Water level rise more than 4 m covers the part of Hazaribagh , Gumla, Latehar, Pakur, Ranchi , Simdega district and in smaller patch like area of Dhanbad and Ramgarh districts.

Fall in Water Levels:

Small parts of Jharkhand state shows fall in water level when it's compared with January 2025 with respect to August 2024 depth to water level. Water level fall within the range of 0-2 m observed in small part of Deoghar, Chatra, Dhanbad and small patches of Khunti, Bokaro, Sahebganj, Palamu districts. Water level fall within the range of 2- 4 m observed in small patches in Deoghar and Sahebganj districts. No wells shows fall in water level more than 4 m.

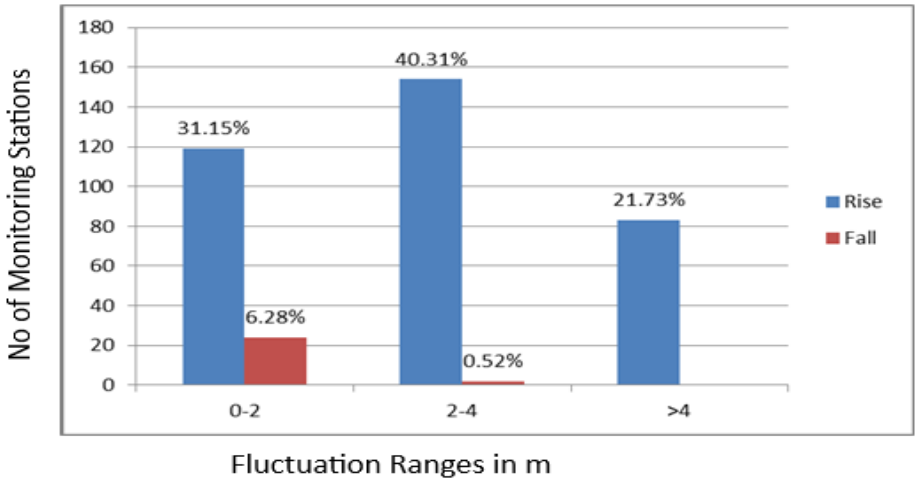


Figure 8: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt August 2024)

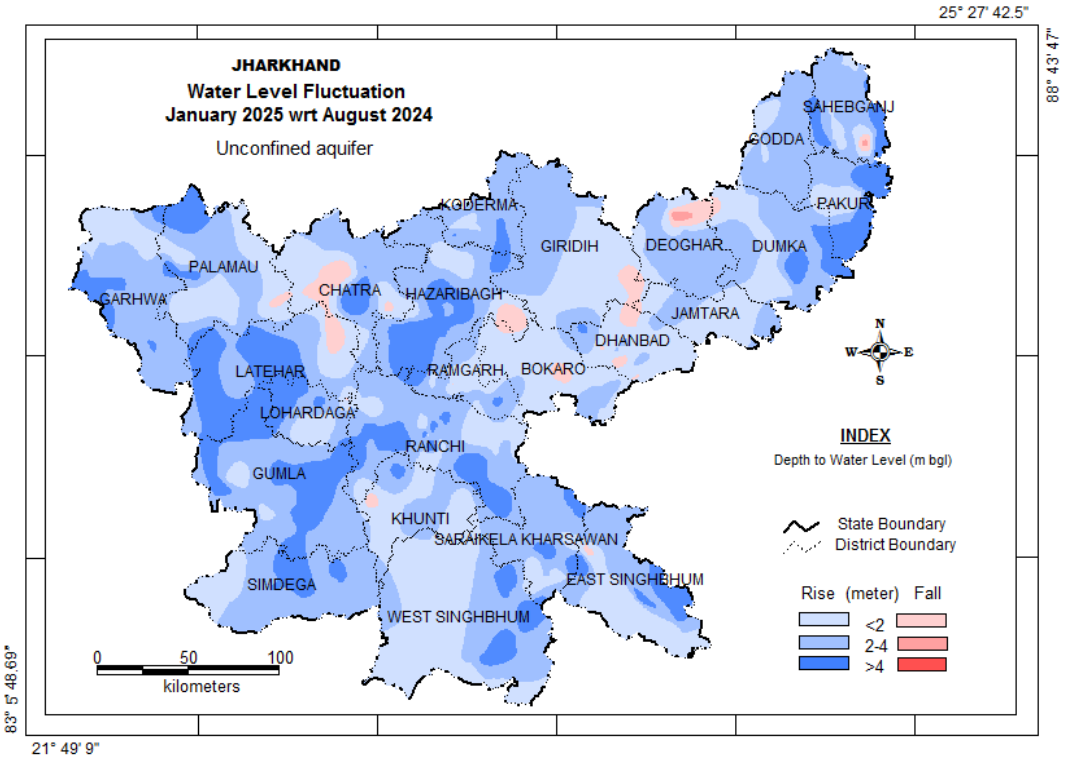


Figure 9: Water level fluctuation in unconfined Aquifer (August 2024 to January 2025)

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

Major area of Jharkhand state shows fall in water level when it's compared with January 2025 with respect to November 2024 depth to water level. (Figure-11)

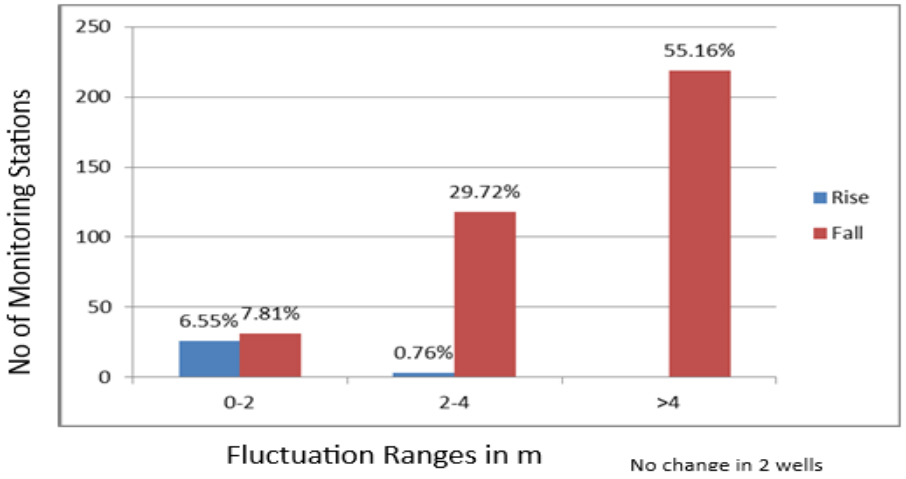


Figure 10: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt November 2024)

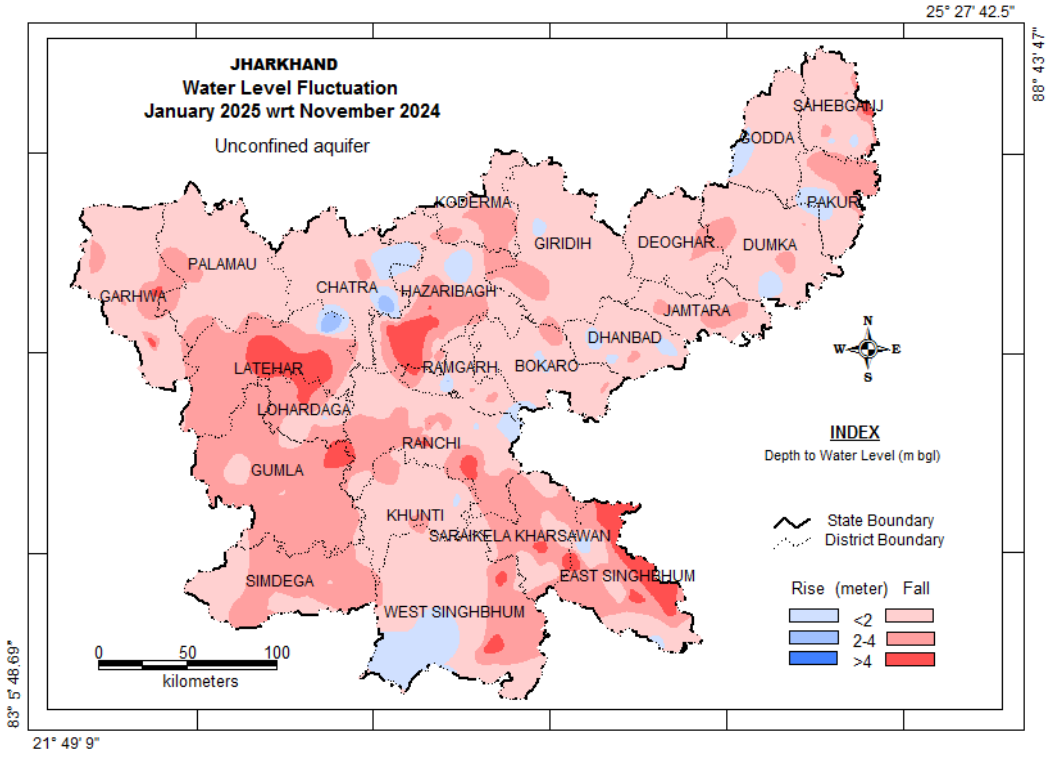


Figure 11: Water level fluctuation in unconfined Aquifer (November 2024 to January 2025)

Fall in Water Levels:

Major parts of the state shows fall in water level within the range of 0-2 m covering the maximum part of Dhanbad, Bokaro, Ramgarh, Giridih, Deoghar, Dumka, Godda, Khunti district and smaller parts of Simdega , Gumla, Koderma, Pakur districts. Water level fall within the range of 2- 4 m has been observed in parts of Gumla, Latehar, Hazaribagh, Koderma, Simdega, also observed in some parts of Dumka, Sahebganj, Deoghar, Chatra, Palamu and other smaller patches in Bokaro , Dhanbad district. Water level fall more than 4 m has been observed in area like Latehar, Hazaribagh, E.Singhbhum, Gumla and also observed small patches like area of Sahebganj, Ranchi and Garhwa district and other small parts of the state.

Rise in Water Levels:

A small area of Jharkhand state shows rise in water level when it's compared with January 2025 with respect to November 2024. Rise of water level in tune of 0-2 m is recorded in parts of Chatra, W.Singhbhum, Godda, Pakur, Dumka, Dhanbad and in small patches of Sahebganj district. 2-4 m rise of water level noticed in very smaller part of Chatra, Latehar districts. No well shows rise in water level more than 4 m.

5.1.3 ANNUAL FLUCTUATION IN WATER LEVEL

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

Rise in Water Levels:

Rise in water level within the range of 0-2 m has been observed in parts of Giridih, Dhanbad, Ranchi, Khunti, E.Singhbhum, some parts of Dumka, Chatra, Palamu, Lohardaga and small patches of Godda, Gumla. Water level rise in the range of 2-4 m observed in parts of Palamu, Garhwa, Latehar, Pakur, Sahebganj districts. Water level rise more than 4 m is observed in parts of Palamu, Latehar, Pakur, Sahebganj and other small parts of the state. (Figure-13)

Fall in Water Levels:

Water level fall within the range of 0-2 m has been observed in parts of Gumla , Simdega, Latehar, Godda, W.Singhbhum, Deoghar and some parts of Dhanbad, Jamtara ,Khunti districts. 2-4 m rise in water level has been observed in smaller part of Dumka, Pakur, Hazaribagh district and in small patches of Dumka, Garhwa and Ranchi district. Water level fall more than 4 m shown in parts of Dumka, Sahebganj, Palamu district.

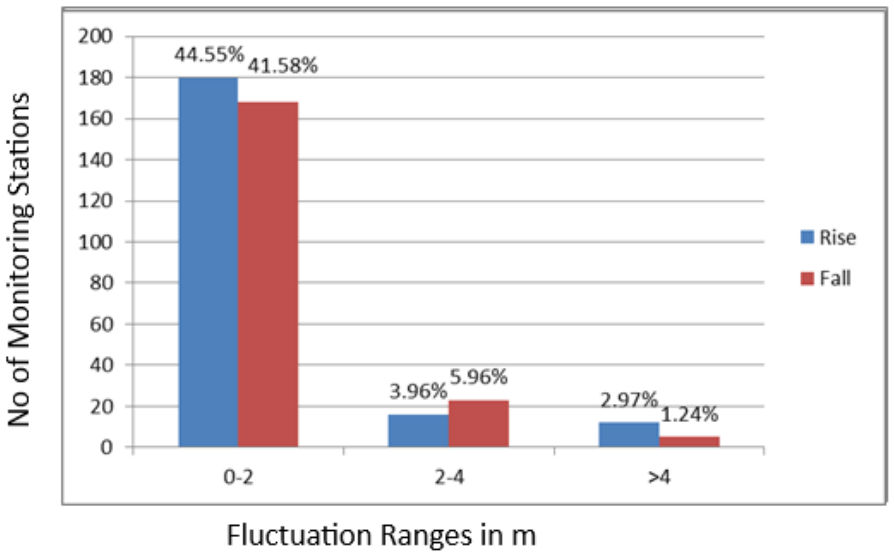


Figure 12: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt January 2024)

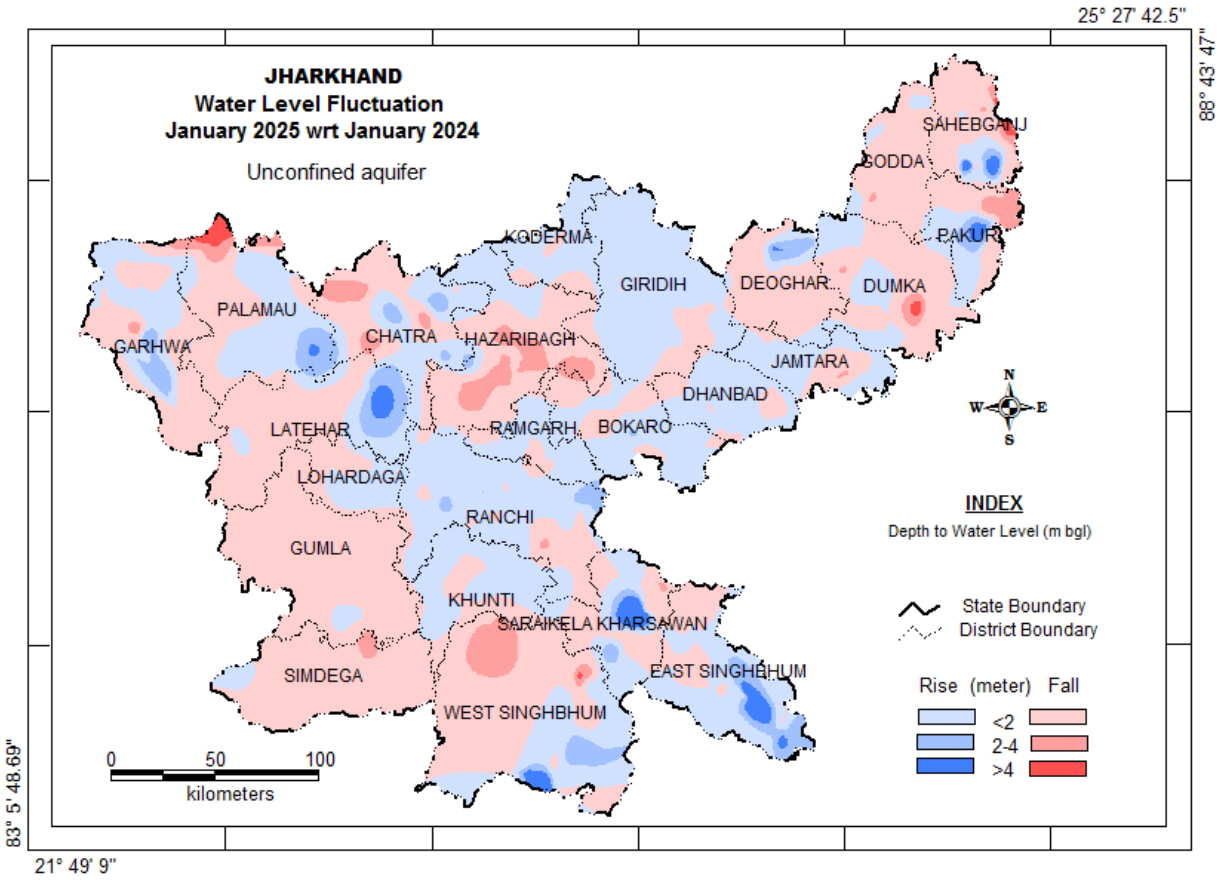


Figure 13: Annual water level fluctuation in unconfined aquifer (January2024 to January 2025)

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

Rise in Water Levels:

Water level rise within the range of 0-2 m has been observed in parts of Koderma, Giridih, Dhanbad, Garhwa district and in small parts of Simdega , Gumla, Sahebganj, Lohardaga districts. Water level rise in the range of 2-4 m observed in parts of Palamu, Khunti, Giridih, Latehar and in small patches of Dhanbad, Ranchi, W.Singhbhum districts. Water level rise more than 4 m has been observed in parts of Jamtara, Sahebganj, Pakur, Giridih and Ranchi districts. (Figure-15)

Fall in Water Levels:

Water level fall within the range of 0-2 m has been observed in parts of Gumla, Simdega, Latehar, W.Singhbhum, some some minor parts observed in area of Giridih, Koderma, Garhwa, Dhanbad districts. 2-4 m fall of water level observed in very small parts of Simdega, Gumla, Hazaribagh, Dumka , Deoghar and small patches in parts of Sahebganj, Ranchi districts. Water level fall more than 4 m shown in parts of Sahebganj, Dumka, E.Singhbhum, Hazaribagh districts.

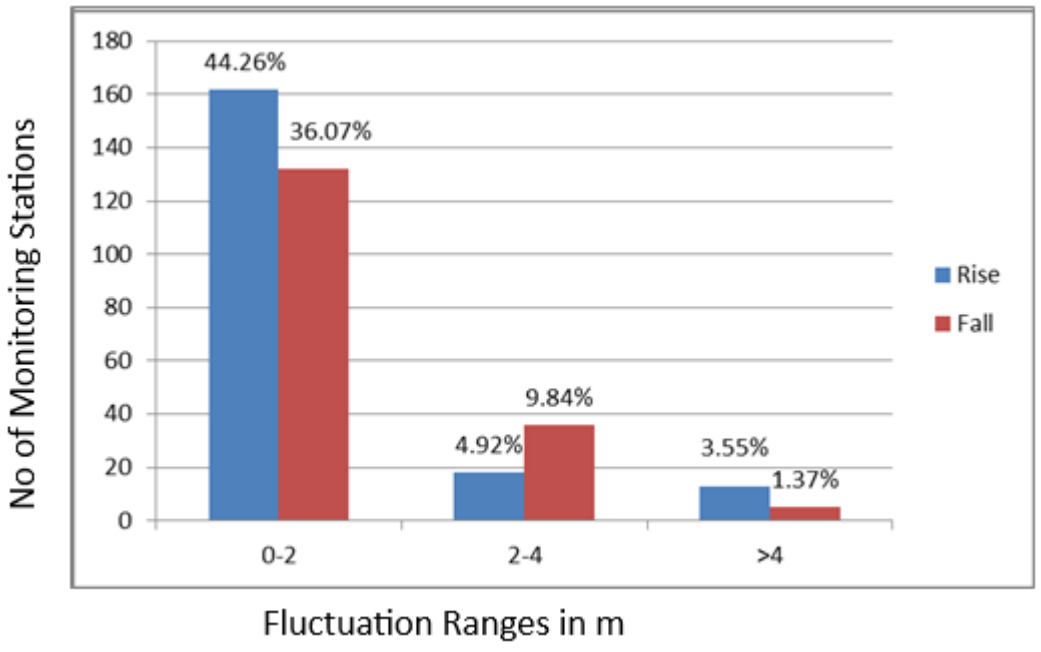


Figure 14: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt January 2023)

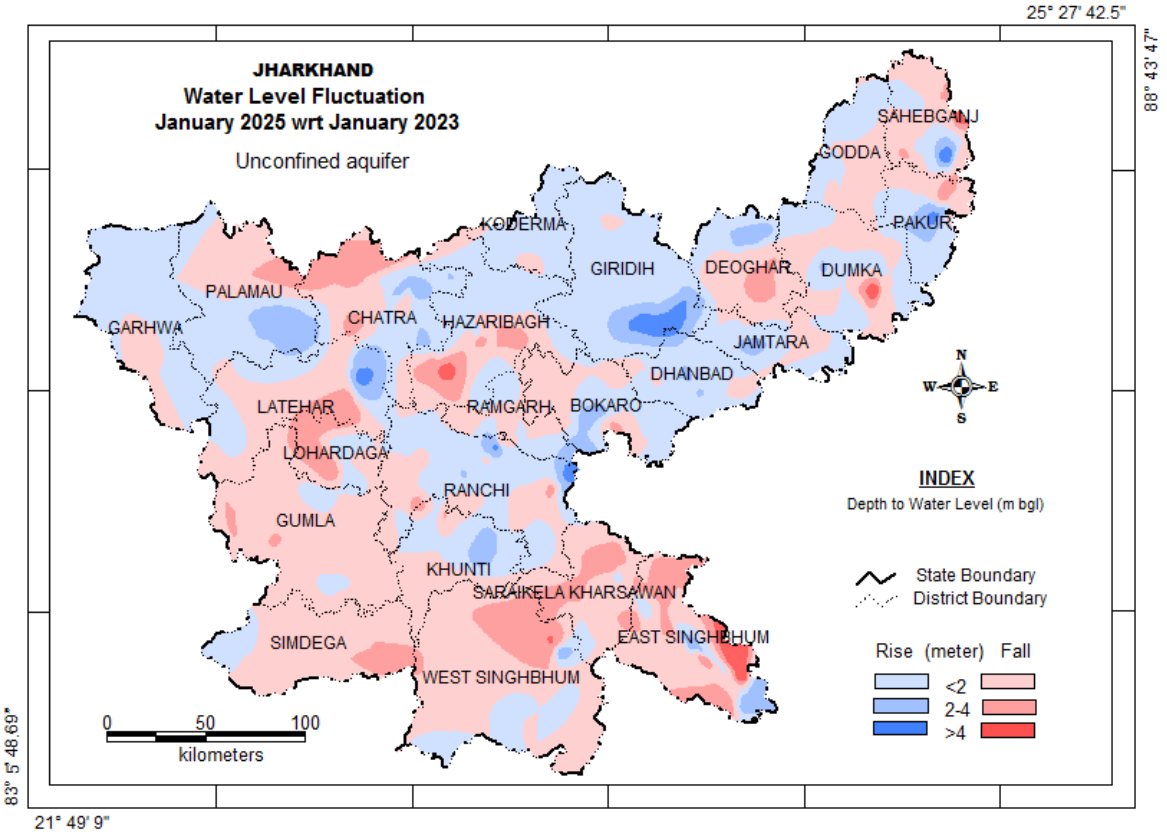


Figure 15: Annual water level fluctuation in unconfined aquifer (January 2023 to January 2025)

5.1.4 DECADAL FLUCTUATION IN WATER LEVEL

Decadal Fluctuation of Water Level in Unconfined Aquifer (Decadal Mean January) (2015-2024) to January 2025)

Rise in Water Levels:

Water level rise within the range of 0-2 m has been observed in parts of Bokaro, Giridih, Garhwa, Dhanbad, Khunti, and in small parts of E.Singhbhum, Simdega, Pakur districts. Water level rise in the range of 2-4 m has been observed in small parts of Giridih, Latehar, Hazaribagh, Deoghar districts and in small patches of E.Singhbhum, Chatra districts. Water level rise more than 4 m shown in parts of Latehar, Sahebganj and Hazaribagh districts. (Figure-17)

Fall in Water Levels:

Water level fall within the range of 0-2 m has been observed in parts of Godda, Dumka, W.Singhbhum, Gumla, E.Singhbhum, Simdega, some parts of Jamtara, Dhanbad, Bokaro, Garhwa districts. 2-4 m fall in water level has been observed in small parts of Simdega, Dumka, Sahebganj, Palamu, Pakur and in small patches of Godda,

W.Singhbhum, Lohardaga districts. Water level fall more than 4 m shown in parts of Sahebganj, Dumka, Latehar, Palamu districts.

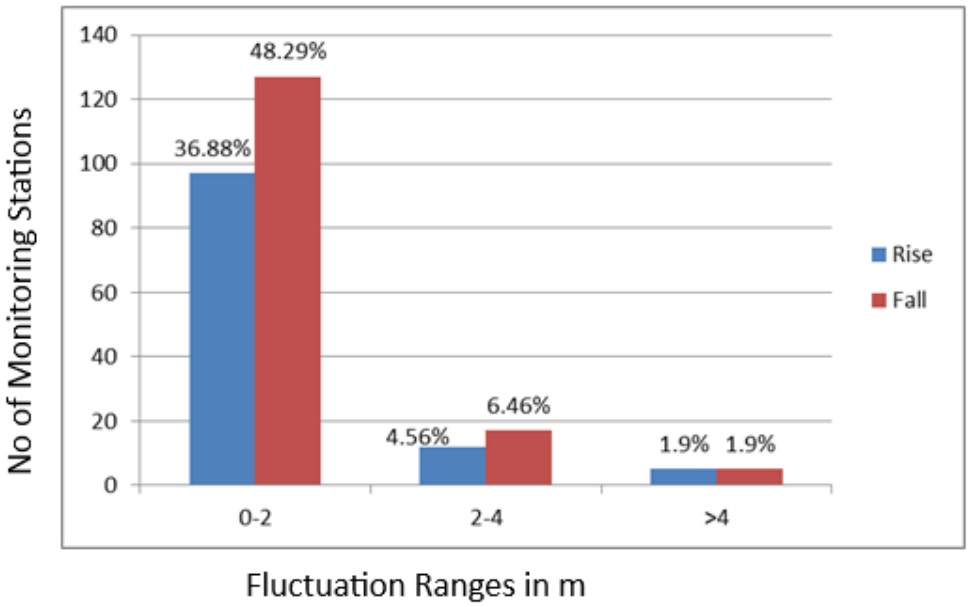


Figure 16: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt mean January 2016 to 24)

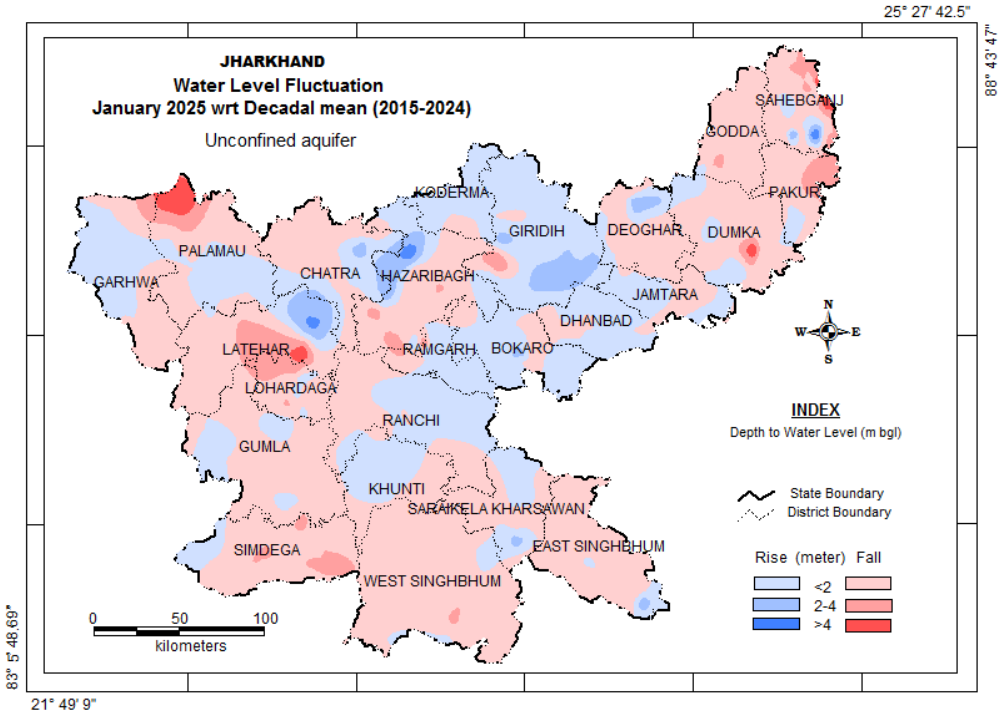


Figure 17: Decadal water level fluctuation in unconfined Aquifer (January 2025 to Decadal Mean January (2015-2024)

5.2 Confined/Semi-confined Aquifer

5.2.1 DEPTH TO PIEZOMETRIC HEAD

The depth to piezometric level map (Figure-19) of confined aquifer for January 2025 depicts that maximum area of Jharkhand state showing water level within range of 5 to 10 m bgl which covers maximum part of garhwa, Palamu, Chatra, Latehar, Lohardaga, ranchi, Hazaribagh, Khunti, West Singhbhum, Giridih, Deoghar, Godda and Sahebganj district and some other parts of the state. In parts of Bokaro, Saraikela Kharsawan, Giridih, Hazaribagh, Koderma, Dumka, Pakur, Jamtara, Simdega, Gumla district shows depth to water level within range of 10-20 m bgl. A small part of northern side of the state covering Dumka, Pakur, Jamtara, Hazaribagh, Koderma and Giridih district and south western part covering part of Gumla and Simdega district shows deeper water level more than 20 m bgl. Water level within range of 2 to 5 m bgl covers part of East Singhbhum and Gumla district. Water level within 2 m bgl during January 2025has not been observed.

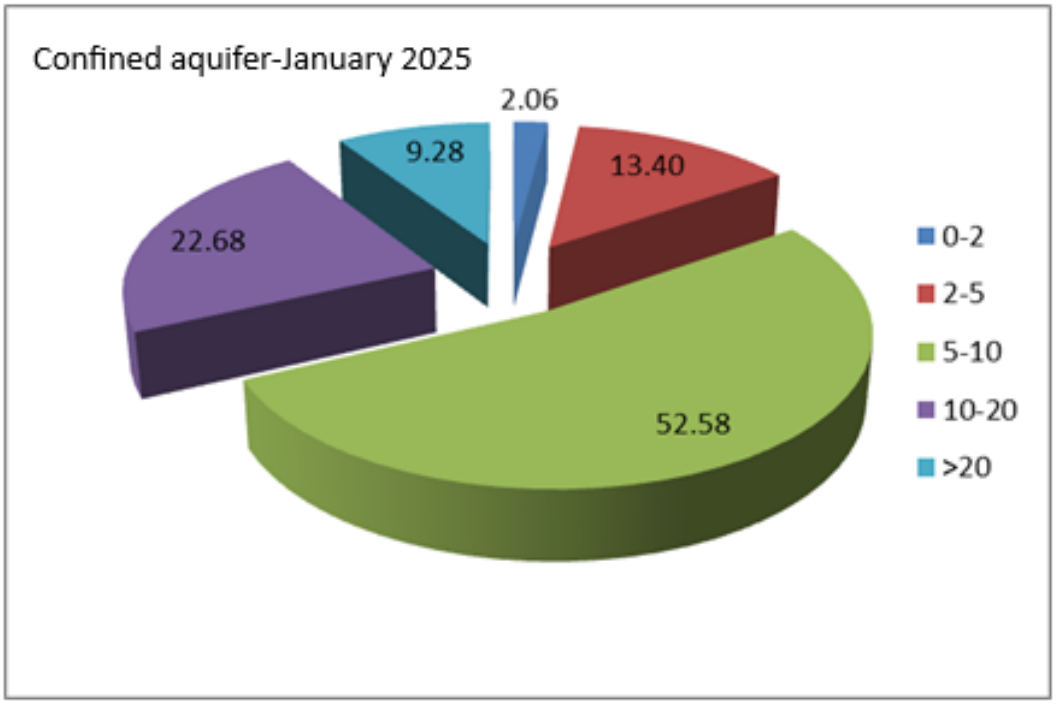


Figure 18- percentage of wells in different water level ranges in confined aquifer

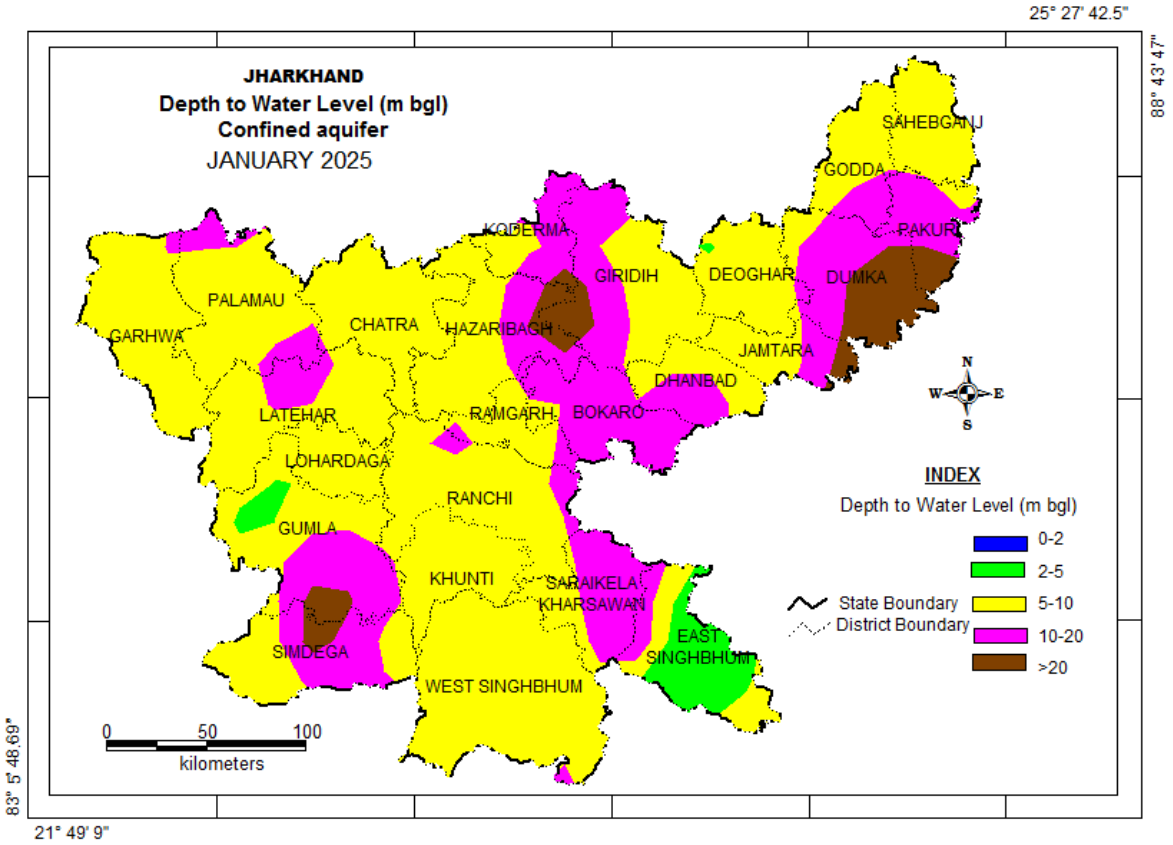


Figure 19: Depth to Piezometric head (January 2025)

5.2.2 SEASONAL FLUCTUATION IN PIEZOMETRIC HEAD

Seasonal Fluctuation of Piezometric head in confined Aquifer (May/Pre-monsoon 2024 to January 2025)

Fluctuation map (Figure-21) of January 2025 with respect to May 2024 in confined aquifer reveals that major part of Jharkhand state shows rise in water level. The maximum part shows water level rise within 2 m covering major part of E & W Singhbhum, Sahebganj, Godda, Dumka, Deoghar, Jamtara, Hazaribagh, Latehar, Lohardaga and Garhwa district. Water level rise in the range 2 to 4 m has been observed in major parts of Palamu, Chatra, Ranchi, Gumla, Dhanbad, Bokaro and Giridih district, some part of Koderma, Latehar, Khunti and Ramgarh district. Water level rise more than 4 m has been observed in parts of Simdega, Gumla, ranchi, Khunti, Bokaro, Dhanbad, Koderma and Giridih district.

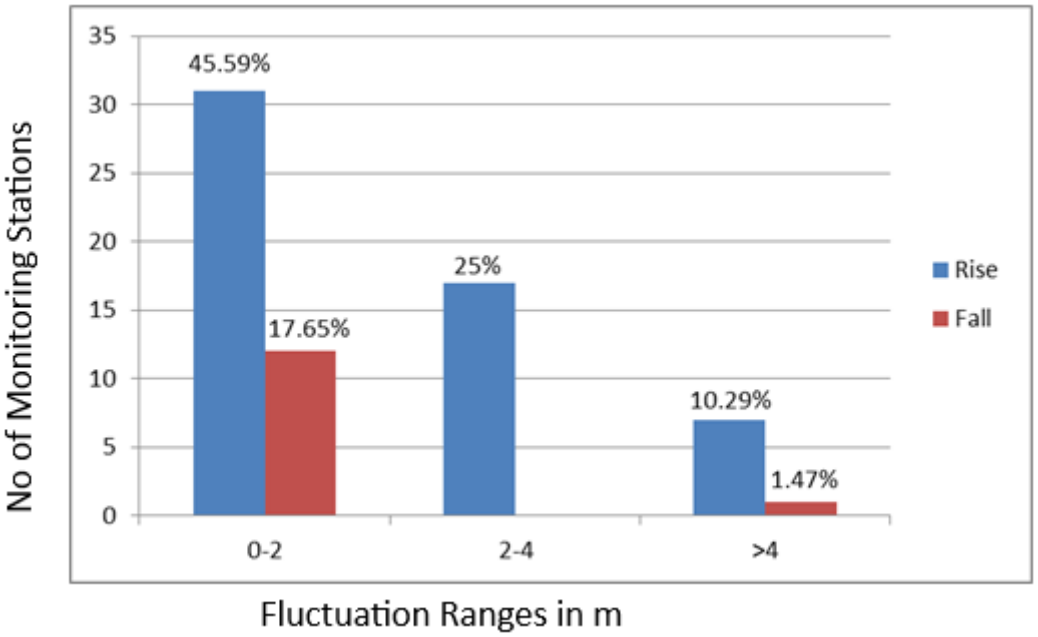


Figure 20: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt May2024)

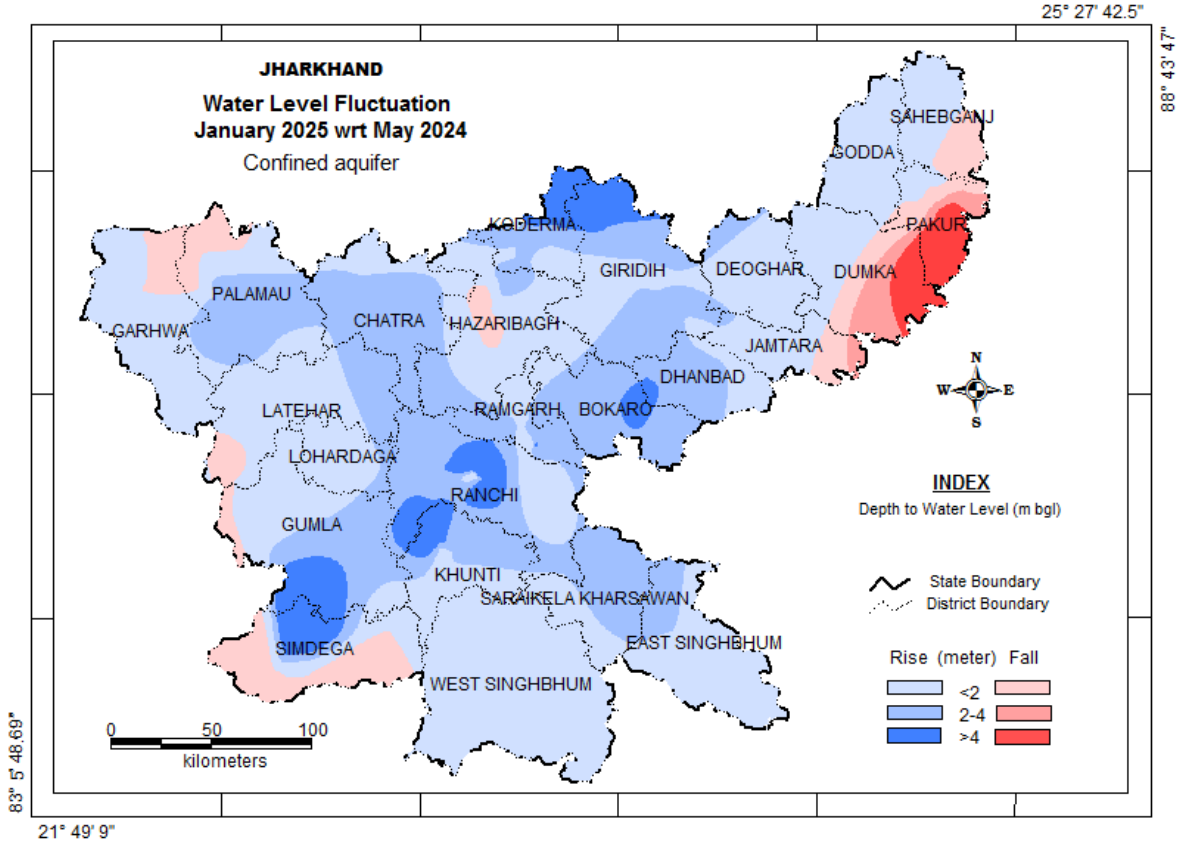


Figure 21: Seasonal Fluctuation of Piezometric head in confined Aquifer (May/Pre-monsoon 2024 to January 2025)

Water level fall has been observed in small parts of north eastern part and western part of the state. Water level fall ranging between 0 to 2m has been observed in parts of Simdega, Gumla, Latehar,Palamu, Garhwa, Hazaribagh, Jmatara, Dumka and Pakur district. Water level fall more 2 -4 m has been observed in parts of Dumka and Pakur district. Water level fall more than 4 m has been observed in small parts of the state covering Pakur and Dumka district.

Seasonal Fluctuation of Piezometric head in confined Aquifer (August 2024 to January 2025)

Fluctuation map (Figure 23) of January 2025 with respect to August 2024 in confined aquifer reveals that major part of Jharkhand state shows fall in water level.

The maximum part shows fall in water level within the range of 2 to 4 m covering major part of Giridih, Hazaribagh, Chatra, Latehar, Gumla, W Singhbhum, Deoghar, Dumka, Sahebganj, Godda and Pakur district and some parts of the state. Water level fall more than 4 m has been observed in major parts of Ranchi, Saraikela Kharsawan, Bokaro and Pakur district and parts of Simdega, W Singhbhum, Gumla Latehar, Gahwa and Palamu district and some other parts of the state. Water level fall within 2 m has been observed in parts of Jamtara, Deoghar, Giridih, Deoghar, Dhanbad, Hazaribagh, Khunti, W Singhbhum, Lohardaga, and Garhwa district and some other small parts of the state.

A small part of the state shows rise in water level, when compared to depth to water level of January 2025 to August 2024. Water level rise within 2 m has been observed in parts of Simdega, Palamu and West Singhbhum district. Water level rise in range of 2-4 m has been observed in a small part of Simdega, Gumla and E Singhbhum district. Water level rise more than 4 m has been observed in only south eastern part of the state which covers major area of East Singhbhum district.

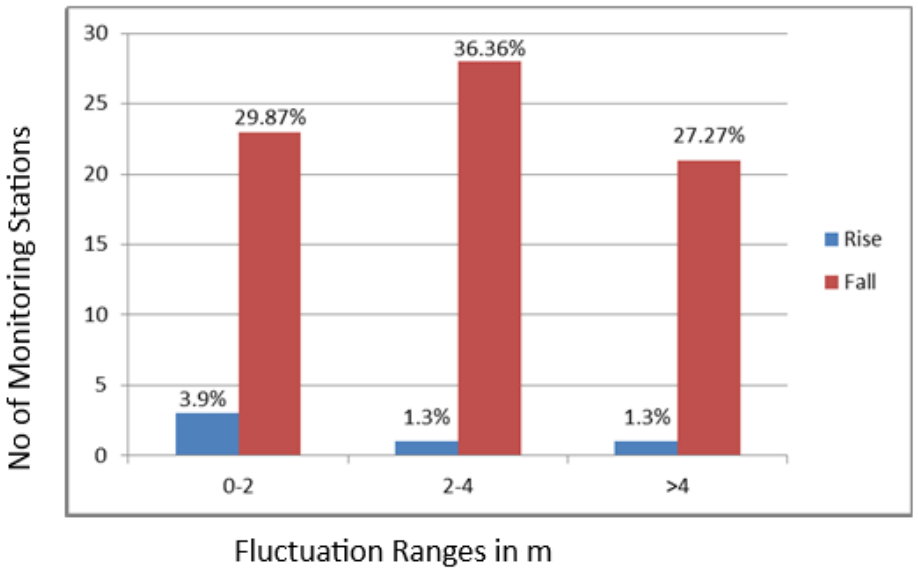


Figure 22: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt August 2024)

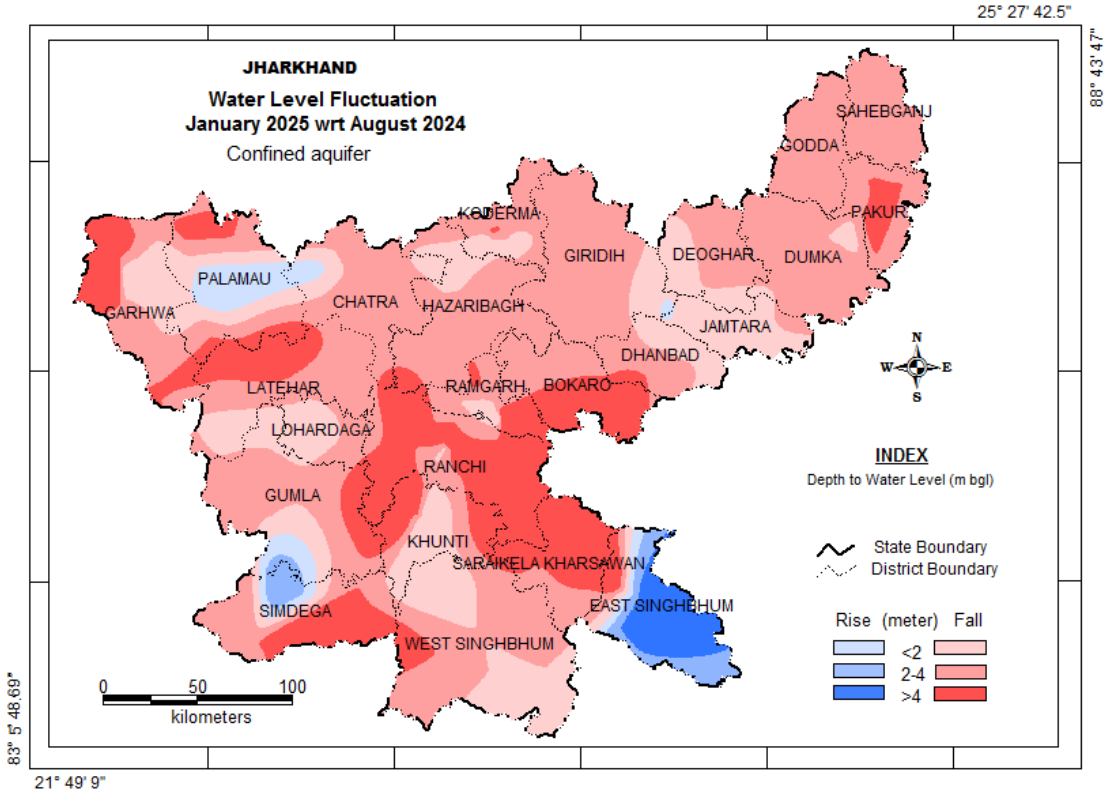


Figure 23: Seasonal Fluctuation of Piezometric head in confined Aquifer (August 2024 to January 2025)

Seasonal Fluctuation of Piezometric Level in confined Aquifer (November 2024 to January 2025)

Fluctuation map (Figure-25) of January 2025 with respect to November 2024 in confined aquifer reveals that major part of Jharkhand state shows fall in water level.

The maximum part shows water level fall within range of 0 to 2 m covering major part of Dumka, Deoghar, Jamtara, Hazaribagh, Ramgarh, Ranchi, Khunti, W Singhbhum, Lohardaga, Chatra, Palamu and Garhwa district, some parts of Pakur, Saraikela Kharsawan, Simdega, Bokaro, Dhanbad district and some parts of the state. Water level fall within range of 2 to 4 m has been observed in major parts of Saraikela Kharsawan, Simdega, Godda, Gumla, Sahebganj and Koderma district. Water level fall more than 4 m has been observed in small parts of the state covering parts of Simdega, Saraikela Kharsawan, Koderma, Giridih and Godda district.

No rise in water level has been observed during the season.

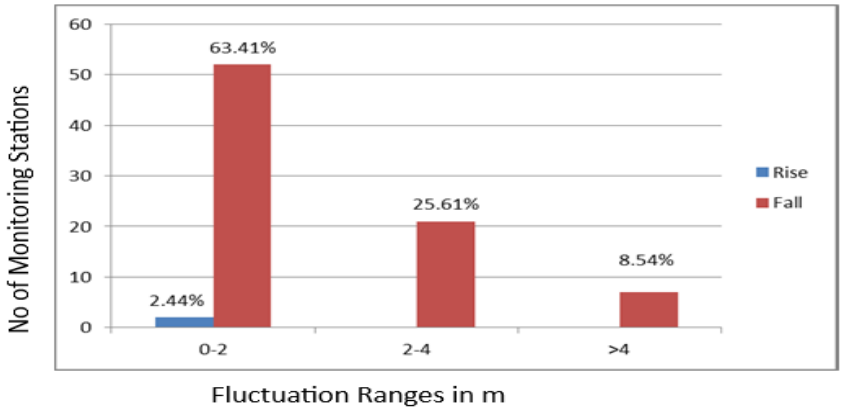


Figure 24: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt November 2024)

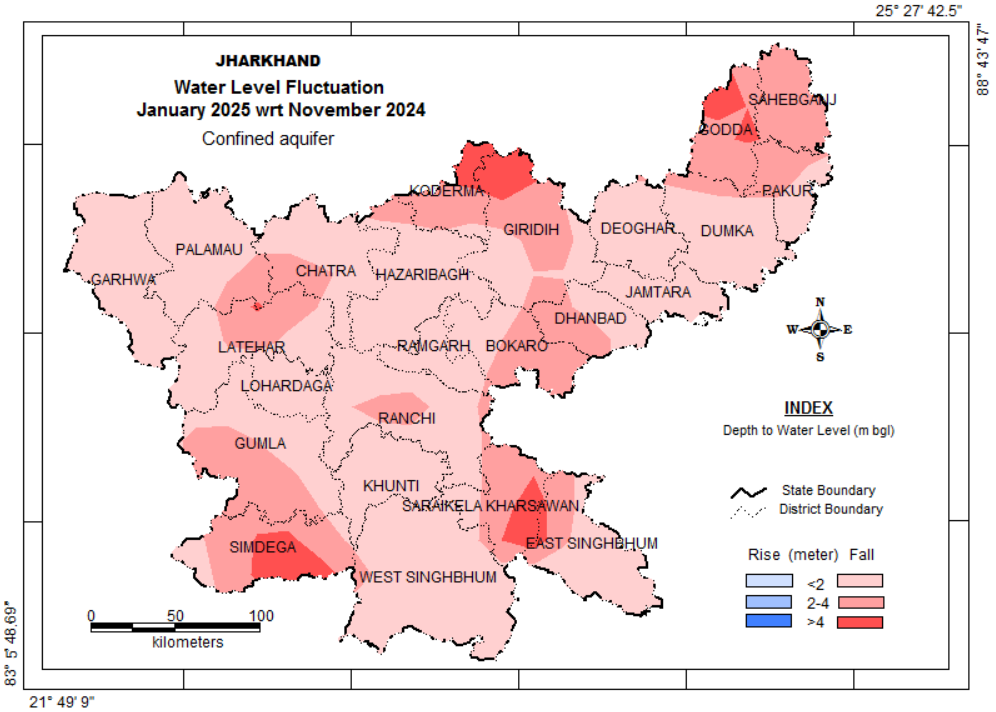


Figure 25: Seasonal Fluctuation of Piezometric head in confined Aquifer (November 2024 to January 2025)

5.2.3 ANNUAL FLUCTUATION IN PIEZOMETRIC LEVEL

Annual Fluctuation of Piezometric Level in confined Aquifer (January 2024 to January 2025)

Depth to piezometric level fluctuation map (Figure-27) of January 2025 with respect to January 2024 shows that there is rise in water level mainly in mid part and south eastern part of the state. 0 to 2m rise in water level has been observed in Palamu, Latehar, Lohardaga, Ranchi, Ramgarh, Dhanbad, Bokaro and Dumka district. Water level rise within the range of 2-4 m has been observed in small part of the state covering major part of East Singhbhum district, parts of Bokaro, Ramgarh, Ranchi, Chatra, Palamu and Garhwa district. Water level rise more than 4 m has been observed in parts of Ranchi and Ramgarh district.

Water level fall observed in north eastern and south western part of the state. Fall of water level within the range of 0 to 2 m covers entire Sahebganj, Godda district, major part of Pakur, Dumka, Deoghar, Jamtara, Hazaribagh, Gumla Latehar, Palamu and Garhwa district and some other part of the state. Water level rise within range of 2 to 4 m has been observed in major part of Simdega and West Singhbhum district and parts of Gumla, Saraikela Kharsawan, Palamu , Pakur district and other parts of the state.

Water level rise within range of 0 to 2 m covers the entire Dhanbad and Lohardaga district, major part of Bokaro, Ranchi, Ramgarh and Palamu district and some other parts of the state. Water level rise within the range of 2 to 4 m has been observed covering major part in East Singhbhum district parts of Garhwa, Chatra, Bokaro, Ramgarh, Ranchi district. Water level rise more than 4 m has been observed in very small part of the state covering Ramgarh and Ranchi district.

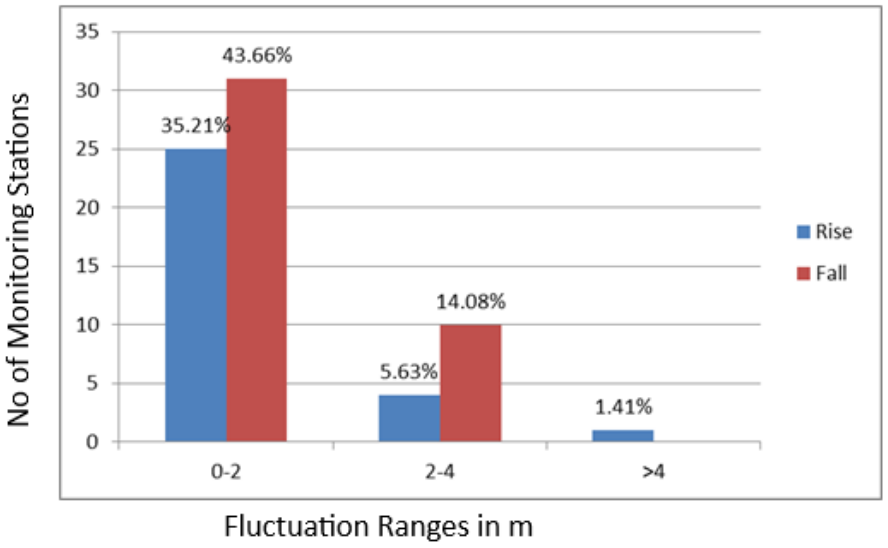


Figure 26: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt January 2024)

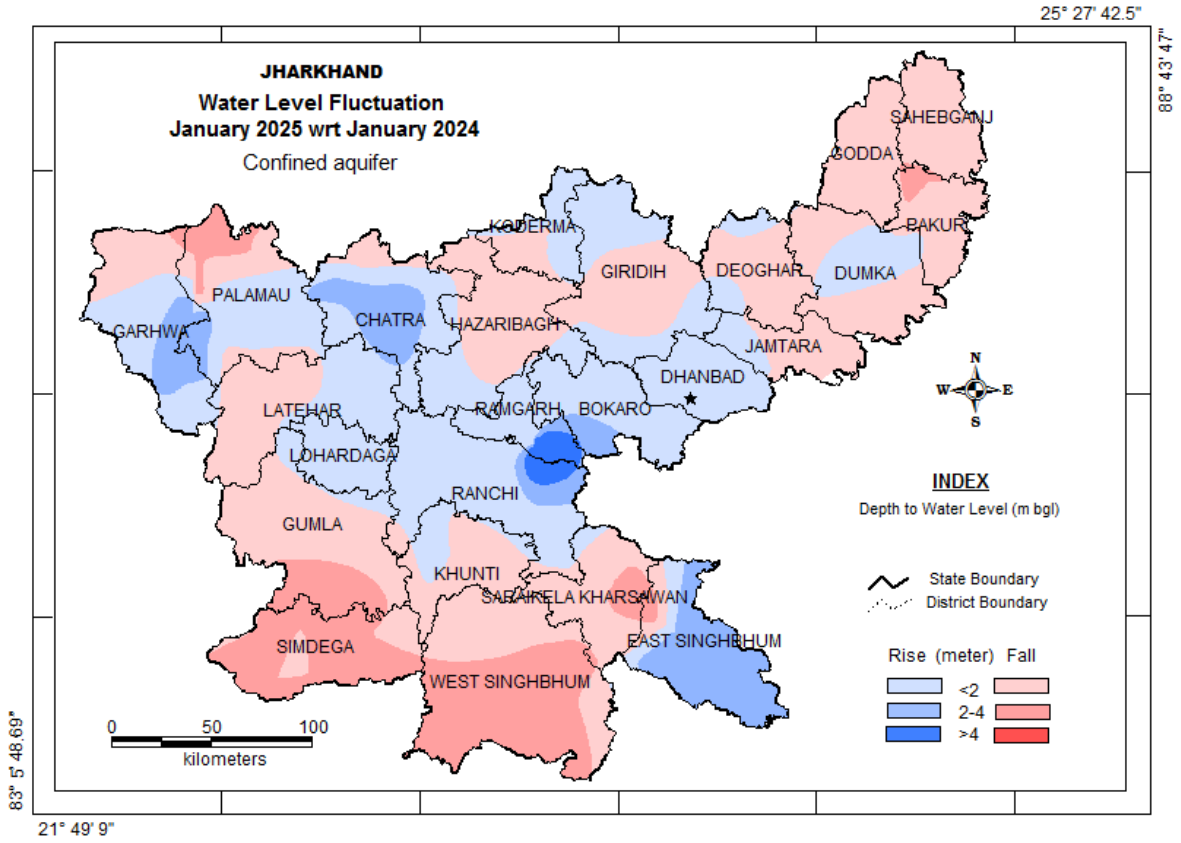


Figure 27: Annual Fluctuation of Piezometric head in confined Aquifer (January 2024 to January 2025)

Annual Fluctuation of Piezometric Level in confined Aquifer (January 2023 to January 2025)

Piezometric level fluctuation map (Figure-29) of January 2025 with respect to January 2023 shows that there is rise of water level mainly in mid and northern part of the state.

Rise in water level in the range of 0 to has been observed in maximum part of Garhwa, Chatra, Latehar, Bokaro, Dhanbad, Khunti, Bokaro, Jamtara and Godda district. Water level rise within range of 2 to 4 m has been observed in major part of West Singhbhum district and parts of Ranchi, Palamu, Dumka, Koderma, Giridih, and Garhwa district. Water level rise more than 4 m has been observed in small part of the state covering the small patches in Saraikela Kharsawan, West Singhbhum, Ranchi, Ramgarh, Dumka, Garhwa and Palamu district.

Water level fall has been observed all over the state except mid part of the state. 0 to 2 m fall of water level has been observed in major part of Sahebganj, Deoghar, Hazaribagh, Pakur, Giridih, Gumla, Latehar and East Singhbhum district. Water level fall within range of 2 to 4 m has been observed in parts of Gumla, Simdega, Saraikela Kharsawan, East Singhbhum and Ranchi district. Water level fall more than 4 m has been observed in parts of Gumla, Simdega Ranchi and East Singhbhum district.

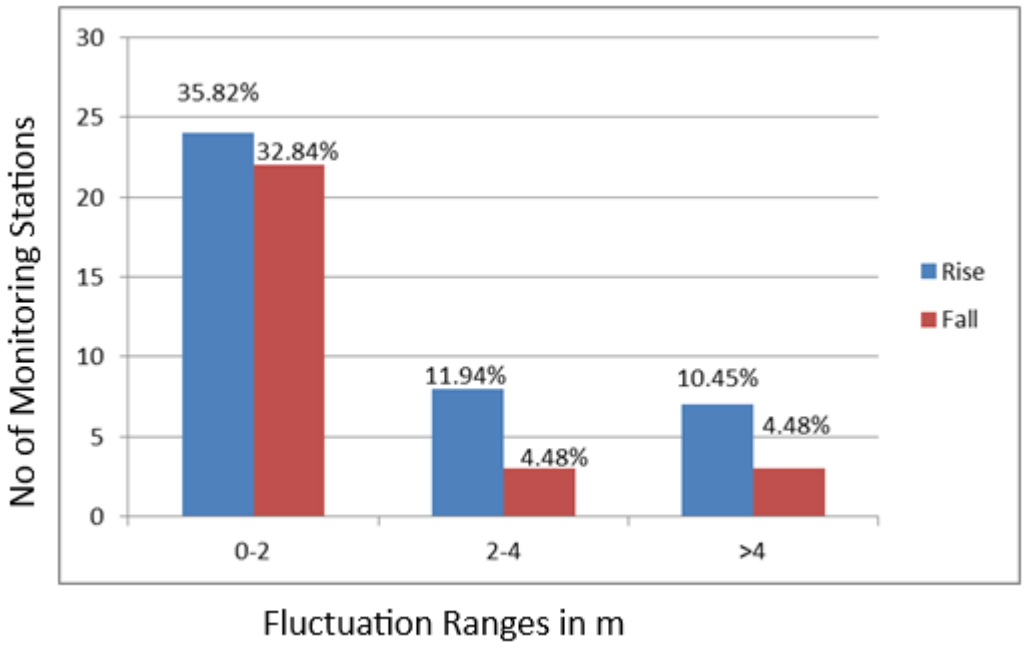


Figure 28: Percentage of wells showing rise and fall in water level in unconfined aquifer (January 2025 wrt January 2023)

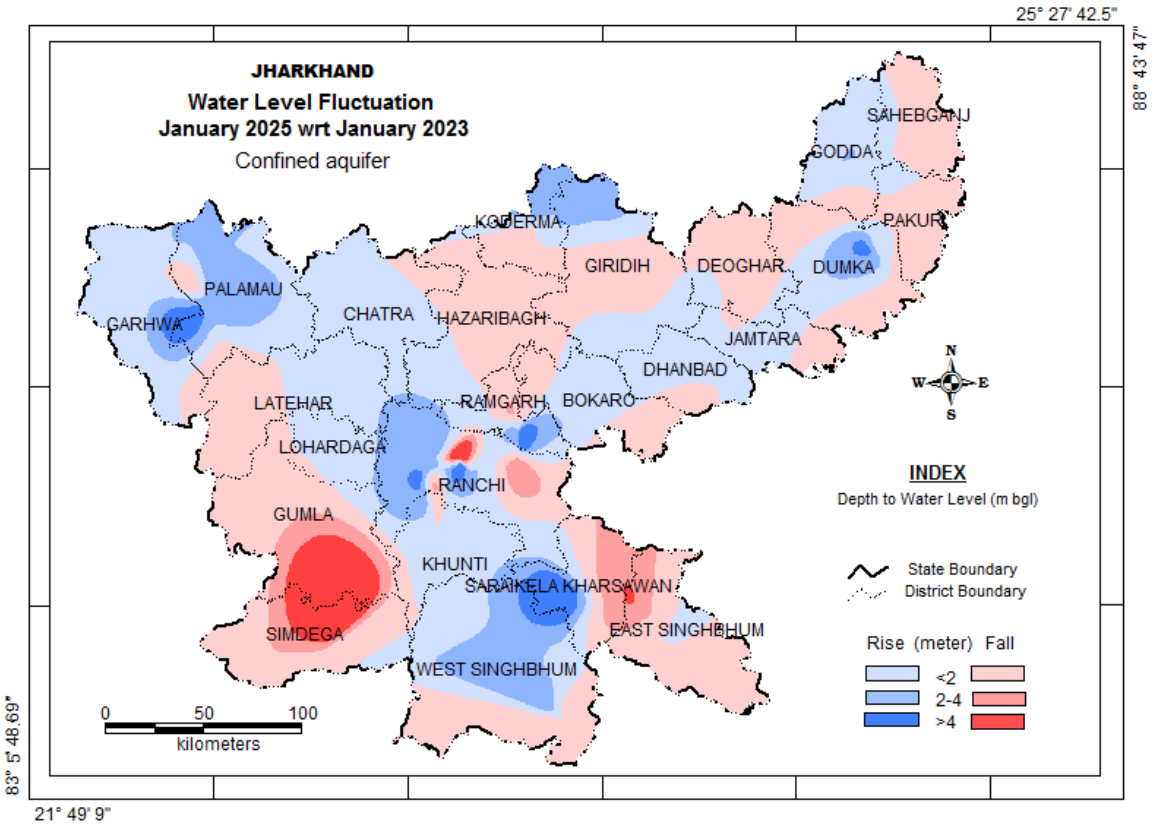


Figure 29: Annual Fluctuation of Piezometric head in confined Aquifer (January 2023 to January 2025)

5.2.4 Decadal Fluctuation in Piezometric Level

In Jharkhand confined/deeper water level monitoring started from August 2022 therefore long term decadal data is not available and hence decadal Fluctuation of Piezometric head in confined Aquifer (Decadal Mean January (2015-2024) to January 2025) could not been analysed.

6.0 SUMMARY

As a component of the National Ground Water Monitoring Programme, the CGWB, SUO Ranchi conducts monitoring of the ground water conditions on a quarterly basis: in January, pre-monsoon May, post- monsoon August, and November.

The Monitoring of National Hydrograph monitoring stations during January 2025 of shows that in unconfined aquifer the water level behavior ranges within 2 to 5 m bgl throughout the Jharkhand state, in some part depth to water level ranges between 5 to 10 m bgl. Few monitoring stations shows water level within the range of 0 to 2 m bgl and also in more than 10 m bgl. When water level compared to May 2024 and August 2024, with respect to January 2025, it shows rise in water level, while in comparison with November 2024 fall in water level has been observed. Annual water level fluctuation shows fall in both, when compared to January 2023 and January 2024 throughout the Jharkhand state. Depth to water level of January 2025 when compared to decadal average water level it shows fall in water level in major part of the state.

The Monitoring of National Hydrograph monitoring stations during January 2025 shows that in Confined aquifer the water level behavior ranges within 5 to 10 m bgl covering maximum area of Jharkhand state, some part shows depth to water level 10 to 20 m bgl. When compared to May 2024 rise in water level has been observed, but comparison between August 2024 and November 2024, fall of water level has been observed in maximum part of the State. Annual water level fluctuation map for January 2025, with respect to January 2023 and January 2024 has been prepared. Both map shows water level rise in Ranchi, Chatra, Ramgarh, Dhanbad and Palamu district and fall in Hazaribagh, Giridih, Gumla, Latehar, Sahebganj amd Palamu district.

7.0 Recommendations

In unconfined aquifer, depth to water level for January 2025 within 2 to 5 m bgl has been observed in major part of Jharkhand state. Seasonal comparison of January 2025 to May 2024 and January 2025 to August 2024 shows rise in water level. Seasonal comparison of January 2025 with November 2024 shows water level fall in major part of the State. When compared with annual fluctuation with January 2023 and January 2024, fall in water level has been observed. The comparison of January 2025 with respect to decadal water level reflects fall in West Singhbhum, Gumla, Latehar, Dumka, Godda, Sahebganj, Pakur districts. These districts has also shown fall in water level when analyzing the annual fluctuation. Therefore it is recommended that unconfined aquifer should be recharged artificially and crops with less water requirement may be cultivated to avoid the rapid depletion of water level.

The water level in confined aquifer shows that major part varies between 5 to 10 m depth to water level. Comparison of pre-monsoon 2024 period and January 2025 piezometric level of confined aquifer shows rise but in comparison with August and November 2024, it shows fall in maximum area of the state. The areas which observed fall is recommended for artificial recharge. The annual fluctuation (both January 2023 and January 2024) with respect to January 2025 shows rise of water level in Ranchi, Chatra, Ramgarh, Dhanbad, and Palamu district and fall in Hazaribagh, Giridih, Gumla, Latehar, Sahebganj and Pakur district. The parts of Gumla and Simdega district shows significant fall of water level during this period, for these highly water deficit area the suitable artificial recharge structure and rejuvenation of ancient conservation structure are recommended with consultation of the line departments to arrest the water level decline.