भूजल स्तर बुलेटिन

पूर्व - मॉनसून

(मई 2025)

Ground water Level Bulletin

Pre-Monsoon

(May 2025)

केंद्रीय भूमि जल बोर्ड

मध्य-पूर्वी क्षेत्र

पटना

Central Ground Water Board
Mid-Eastern Region
Patna

1.0 Introduction

The Central Ground Water Board (CGWB) prepares a groundwater bulletin that depicts changes in the groundwater regime of the state across different seasons. This bulletin is based on data collected from representative monitoring wells to assess groundwater levels.
Groundwater regime monitoring is influenced by both natural and human factors. Natural factors include climatic parameters such as rainfall and evapotranspiration, while human activities like groundwater extraction, irrigation recharge, and waste disposal also impact water levels.
Central Ground Water Board, MER, Patna monitors groundwater levels four times a year—in January, May, August, and November. This monitoring Programme has been in place since 1969. In Bihar, the monitoring is carried out through a network of 1094 wells, known as National Hydrograph Network Stations (NHNS).

2.0 Study Area

Bihar state lies between 83° 19' 50" and 88° 17' 40" E Longitudes and 24° 20' 10" and 27° 31' 15" N Latitudes *(Source: https://state.bihar.gov.in/)* . It shares international border with Nepal in the north and is bounded in the east, west and south by West Bengal, Uttar Pradesh and Jharkhand states respectively. The state covers geographical area of 94,163 Sq.km and has its capital at Patna (Fig 1). Administratively, the state of Bihar is divided into 38 districts and 534 community development blocks. As per the 2011 Census, the total population of the state is 103,804,637, with a population density of 1,102 persons per square kilometre. On average, each district has a population of approximately 2,731,701. The most populous district is Patna, with a population of 5,772,804, while the least populous is Sheikhpura, with 634,927 inhabitants.
(source https://dse.bihar.gov.in/Source/Provisional%20Population%20Totals%202011-Bihar.pdf).

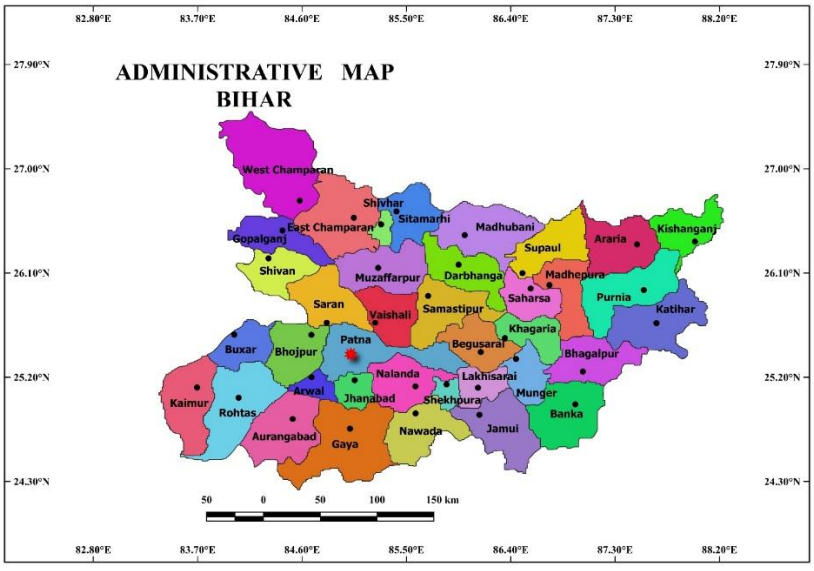

Figure-1: Map showing major administrative divisions of Bihar

Bihar's geology is characterized by three major geological units: the southern Precambrian rocks of the Chotanagpur Granite-Gneiss Complex, the Vindhyan sedimentary formations in the southwest, and the vast alluvial plains of the Indo-Gangetic basin in the north. The southern region is underlain by ancient crystalline rocks—mainly granites, gneisses, schists, and quartzites—while the Vindhyan Supergroup, comprising sandstones, limestones, and shales, occurs prominently in the Kaimur–Rohtas plateau area. The northern part of Bihar, which makes up most of the state, is covered by Quaternary alluvium deposited by major rivers like the Ganga, Gandak, Kosi, and Son, forming fertile plains and flood-prone regions.

(***Source:***
Geological Survey of India (2012). Concise Information on Background and State-wise Geology and Mineral Resources – Bihar)

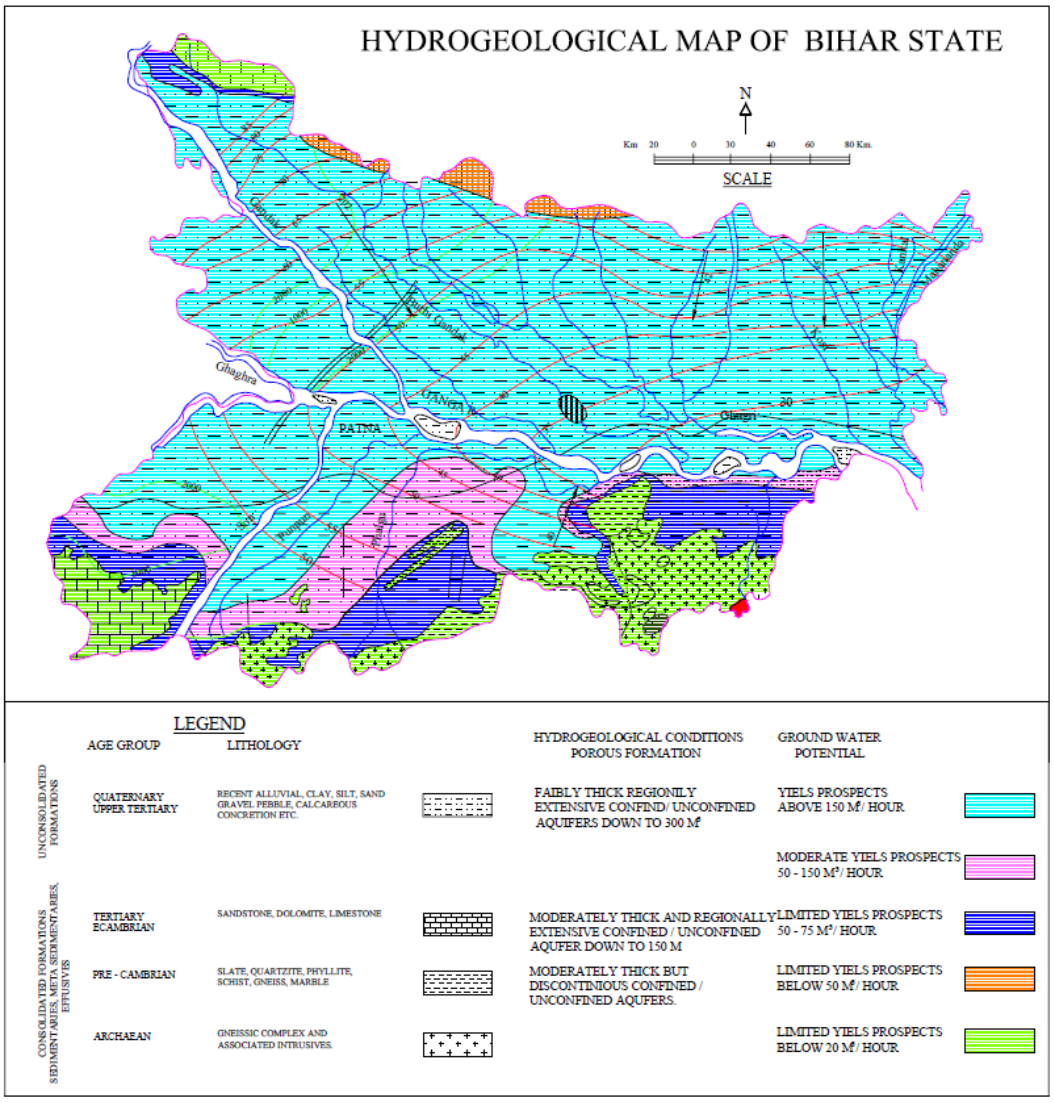

Figure -2: Hydrogeological Map of Bihar state

3.0 Ground Water Level Monitoring

Central Ground Water Board, Mid Eastern Region, Patna, is monitoring changes in groundwater regime in the state on quarterly basis continuously. This is facilitated by a network of monitoring stations across the State, located in diverse hydrogeological and geomorphic units. As of May 2025, there are 1,094 monitoring wells for groundwater regime monitoring. Out of these, 977 are dug wells, 94 are piezometers, and 23 are RTDAS stations. Groundwater level data was successfully collected from 883 of these wells. The water level data from the remaining wells could not be collected due to various factors such as wells being dry, locked gates, and lack of accessibility. The district-wise breakup of the water level monitoring stations is given in **Table-1**

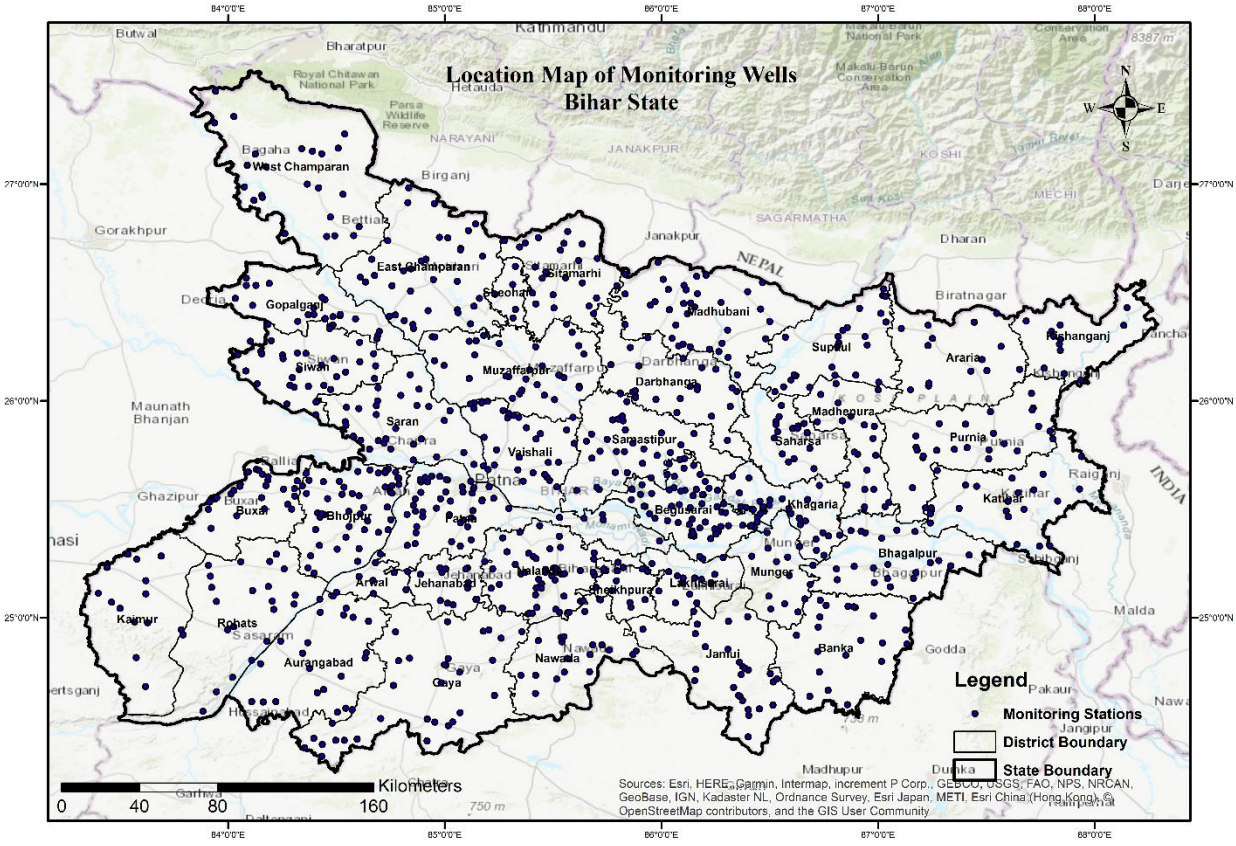

Figure 3- Map showing Location map of Monitoring wells Bihar

Table :1				
District-wise distribution of water level monitoring stations in Bihar				
Name of District	**No. of Dug wells**	**No. of piezometers**	**No.of RTDAS**	**Total**
ARARIA	13	4	0	17
ARWAL	11	0	0	11
AURANGABAD	19	1	2	22
BANKA	20	1	0	21
BEGUSARAI	59	0	1	60
BHAGALPUR	22	0	1	23
BHOJPUR	46	2	0	48
BUXAR	32	7	3	42
DARBHANGA	23	7	0	30
GAYA	33	12	0	45
GOPALGANJ	25	3	0	28
JAMUI	27	1	0	28
JEHANABAD	12	2	0	14
KAIMUR (BHABUA)	15	3	2	20
KATIHAR	24	3	1	28
KHAGARIA	29	2	2	33
KISHANGANJ	14	0	0	14
LAKHISARAI	14	0	0	14
MADHEPURA	20	0	0	20
MADHUBANI	36	0	0	36
MUNGER	13	0	0	13
MUZAFFARPUR	31	0	1	32
NALANDA	45	4	0	49
NAWADA	23	1	0	24
PASHCHIM CHAMPARAN	24	3	0	27
PATNA	44	25	9	78
PURBI CHAMPARAN	37	1	0	38
PURNIA	25	0	0	25
ROHTAS	23	1	1	25
SAHARSA	17	0	0	17
SAMASTIPUR	27	2	0	29
SARAN	40	3	0	43
SHEIKHPURA	12	1	0	13
SHEOHAR	8	0	0	8
SITAMARHI	25	2	0	27
SIWAN	31	2	0	33
SUPAUL	26	0	0	26
VAISHALI	32	1	0	33
TOTAL	977	94	23	1094

Table1 District-wise distribution of water level monitoring stations in Bihar

4.0 Rainfall

DISTRICTWISE RAINFALL DISTRIBUTION

S.No.	MET. SUBDIVISION/ UT STATE/DISTRICT (NAME)	DAY : 01.06.2025 TO 01.06.2025				PERIOD : 01.06.2025 TO 01.06.2025			
		ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.	ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.
1	ARARIA	1.2	4.6	-75%	LD	1.2	4.6	-75%	LD
2	ARWAL	0.0	1.5	-100%	NR	0.0	1.5	-100%	NR
3	AURANGABAD	0.0	0.4	-100%	NR	0.0	0.4	-100%	NR
4	BANKA	0.3	1.4	-75%	LD	0.3	1.4	-75%	LD
5	BEGUSARAI	2.0	2.7	-28%	D	2.0	2.7	-28%	D
6	BHABUA	0.0	0.4	-100%	NR	0.0	0.4	-100%	NR
7	BHAGALPUR	3.4	4.1	-17%	N	3.4	4.1	-17%	N
8	BHOJPUR	0.0	1.0	-100%	NR	0.0	1.0	-100%	NR
9	BUXAR	0.3	0.8	-59%	D	0.3	0.8	-59%	D
10	DARBHANGA	10.0	2.3	337%	LE	10.0	2.3	337%	LE
11	EAST CHAMPARAN	0.0	2.2	-100%	NR	0.0	2.2	-100%	NR
12	GAYA	0.0	0.7	-99%	LD	0.0	0.7	-99%	LD
13	GOPALGANJ	2.4	1.6	49%	E	2.4	1.6	49%	E
14	JAHANABAD	0.0	3.4	-100%	NR	0.0	3.4	-100%	NR
15	JAMUI	3.7	1.4	162%	LE	3.7	1.4	162%	LE
16	KATIHAR	8.8	4.4	99%	LE	8.8	4.4	99%	LE
17	KHAGARIA	0.2	1.8	-90%	LD	0.2	1.8	-90%	LD
18	KISHANGANJ	14.3	6.2	131%	LE	14.3	6.2	131%	LE
19	LAKHISARAI	2.0	2.8	-30%	D	2.0	2.8	-30%	D
20	MADHEPURA	0.0	3.3	-100%	NR	0.0	3.3	-100%	NR
21	MADHUBANI	7.8	1.9	312%	LE	7.8	1.9	312%	LE
22	MONGHYR	0.5	1.6	-70%	LD	0.5	1.6	-70%	LD
23	MUZAFFARPUR	2.7	2.3	17%	N	2.7	2.3	17%	N
24	NALANDA	0.0	1.8	-100%	NR	0.0	1.8	-100%	NR
25	NAWADA	0.0	1.7	-100%	NR	0.0	1.7	-100%	NR
26	PATNA	0.6	2.1	-69%	LD	0.6	2.1	-69%	LD
27	PURNEA	0.8	4.6	-83%	LD	0.8	4.6	-83%	LD
28	ROHTAS	0.4	0.2	89%	LE	0.4	0.2	89%	LE
29	SAHARSA	3.7	3.1	18%	N	3.7	3.1	18%	N
30	SAMASTIPUR	3.0	1.7	74%	LE	3.0	1.7	74%	LE
31	SARAN	0.0	2.1	-100%	NR	0.0	2.1	-100%	NR
32	SHEIKHPURA	0.9	0.9	-4%	N	0.9	0.9	-4%	N
33	SHEOHAR	0.0	1.8	-100%	NR	0.0	1.8	-100%	NR
34	SITAMARHI	4.2	3.8	11%	N	4.2	3.8	11%	N
35	SIWAN	1.1	2.3	-52%	D	1.1	2.3	-52%	D
36	SUPAUL	5.4	3.2	68%	LE	5.4	3.2	68%	LE
37	VAISHALI	0.8	1.7	-52%	D	0.8	1.7	-52%	D
38	WEST CHAMPARAN	0.2	2.7	-91%	LD	0.2	2.7	-91%	LD

Table 2: Rainfall deviation from normal rainfall

PERIOD: 01-03-2025 TO 28-05-2025

S. NO.	MET. SUBDIVION/STATE/ DISTRICT	12.03.2025	19.03.2025	26.03.2025	02.04.2025	09.04.2025	16.04.2025	23.04.2025	30.04.2025	07.05.2025	14.05.2025	21.05.2025	28.05.2025
1	ARARIA	-100%	-100%	873%	-100%	25%	511%	7%	-51%	-20%	-27%	420%	-64%
2	ARWAL	-100%	-100%	31%	-100%	-100%	100%	-100%	1133%	-100%	-100%	-100%	98%
3	AURANGABAD	-100%	-92%	274%	-100%	-100%	258%	-100%	-2%	249%	-84%	60%	93%
4	BANKA	-100%	-100%	-82%	-100%	-100%	1482%	886%	-62%	421%	-100%	14%	222%
5	BEGUSARAI	-100%	-100%	-100%	-100%	181%	1098%	1048%	49%	135%	-5%	-99%	15%
6	BHABUA	-100%	-100%	-44%	-100%	-100%	408%	-100%	-58%	768%	-1%	-100%	95%
7	BHAGALPUR	-100%	-99%	-99%	-100%	-85%	591%	102%	-94%	23%	-100%	-75%	7%
8	BHOJPUR	-100%	-100%	54%	-100%	-83%	1312%	-86%	23%	298%	60%	-100%	-39%
9	BUXAR	-100%	-100%	191%	-100%	-100%	743%	-100%	-78%	554%	-83%	-100%	99%
10	DARBHANGA	-100%	-100%	303%	-100%	54%	364%	114%	127%	17%	-76%	42%	-54%
11	EAST CHAMPARAN	-100%	-94%	-100%	-100%	65%	996%	-22%	-56%	-9%	46%	-34%	-34%
12	GAYA	-100%	-96%	155%	-100%	-100%	830%	-100%	364%	655%	-64%	22%	168%
13	GOPALGANJ	-100%	-89%	-100%	-100%	-100%	1651%	122%	-97%	208%	-68%	-11%	-60%
14	JAHANABAD	-100%	-100%	111%	-100%	-100%	642%	-100%	-100%	352%	-100%	-100%	-65%
15	JAMUI	-100%	-100%	77%	-100%	-100%	2252%	319%	-1%	479%	-96%	-5%	16%
16	KATIHAR	-100%	-100%	25%	-100%	-100%	776%	-74%	-82%	128%	-99%	163%	109%
17	KHAGARIA	-100%	-100%	-100%	-100%	-100%	1906%	355%	181%	129%	-100%	-53%	67%
18	KISHANGANJ	-100%	-100%	39%	-100%	32%	407%	-66%	93%	-16%	-57%	162%	-18%
19	LAKHISARAI	-100%	-100%	-100%	-100%	-86%	4072%	1130%	-73%	126%	-39%	62%	-96%
20	MADHEPURA	-100%	-100%	92%	-100%	-100%	1028%	-79%	-2%	-17%	-97%	35%	-61%
21	MADHUBANI	-100%	-100%	1070%	-100%	588%	810%	-76%	188%	-98%	-89%	80%	-5%
22	MONGHYR	-100%	-100%	-100%	-100%	54%	1953%	638%	-32%	105%	-100%	-99%	245%
23	MUZAFFARPUR	-100%	-100%	-100%	-100%	-100%	470%	155%	103%	24%	58%	-19%	-61%
24	NALANDA	-100%	-100%	-63%	-100%	11%	2562%	64%	-29%	1039%	-89%	-100%	-2%
25	NAWADA	-100%	-100%	85%	-100%	316%	4019%	-100%	-24%	188%	-96%	10%	58%
26	PATNA	-100%	-100%	-74%	-100%	-99%	1321%	182%	41%	493%	-75%	-99%	-97%
27	PURNEA	-100%	-99%	200%	-100%	-99%	568%	-39%	-22%	28%	-96%	256%	-22%
28	ROHTAS	-100%	-99%	-34%	-100%	-33%	322%	-100%	-58%	149%	11%	-98%	114%
29	SAHARSA	-100%	-100%	70%	-100%	-100%	1023%	-47%	-49%	-53%	-84%	-71%	-72%
30	SAMASTIPUR	-100%	-100%	-100%	-100%	-100%	496%	459%	-80%	236%	-5%	-48%	-73%
31	SARAN	-100%	-100%	-100%	-100%	-100%	1054%	57%	-41%	358%	-49%	-93%	-99%
32	SHEIKHPURA	-100%	-100%	-77%	-100%	-100%	6011%	317%	-57%	7%	-100%	-90%	-95%
33	SHEOHAR	-100%	-100%	26%	-100%	931%	919%	27%	-86%	-100%	-60%	-34%	-63%
34	SITAMARHI	-100%	-100%	188%	-100%	405%	467%	92%	-62%	-94%	-90%	-6%	-46%
35	SIWAN	-100%	-100%	-100%	-100%	-100%	2094%	68%	-86%	494%	-66%	-81%	29%
36	SUPAUL	-100%	-100%	506%	-100%	293%	1123%	-84%	48%	-20%	-87%	153%	7%
37	VAISHALI	-100%	-100%	-100%	-100%	-100%	846%	243%	36%	460%	-94%	-87%	-77%
38	WEST CHAMPARAN	-100%	-100%	-79%	-100%	-100%	580%	-49%	-19%	45%	-68%	7%	-5%

Table 3: District wise variability of rainfall in the state

Depth To Water Level in Unconfined Aquifer (May 2025).

Depth to Water Level in the unconfined aquifer for May 2025 has been analyzed from 804 dug wells. The water levels range from 0.9 mbgl in Nalanda district to 16.8 mbgl in Bhagalpur district. About 3% of the wells have a water level of less than 2 mbgl, 43% of the wells have water levels between 2 to 5 mbgl, 51% have water levels between 5 to 10 mbgl, and 3% of wells show water levels more than 10 mbgl.

Shallow water levels ranging from 2 to 5 mbgl are mainly observed in the northern part of Bihar. Water levels between 5 and 10 mbgl are found across the state, while levels deeper than 10 mbgl occur only in a few small patches.

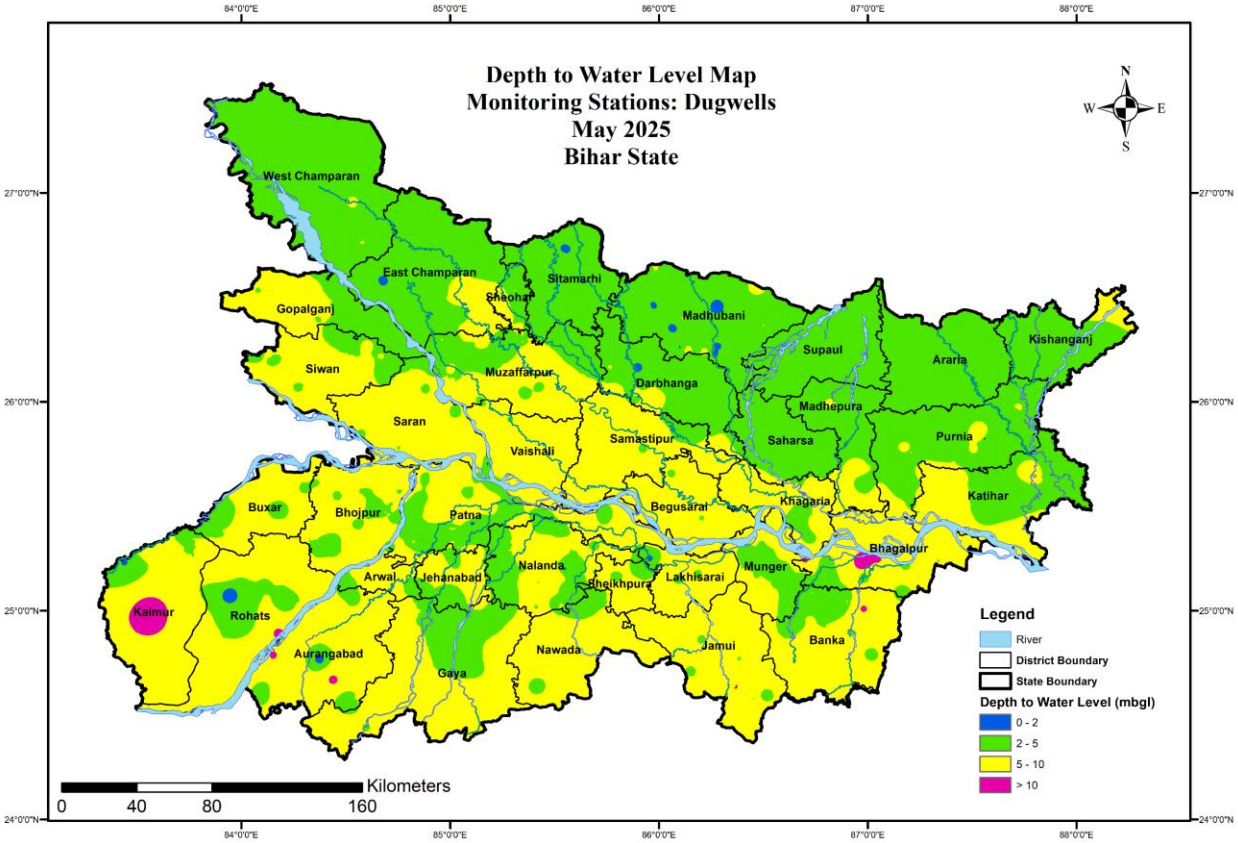

Figure 4 Depth To Water Level in Unconfined Aquifer (May 2025)

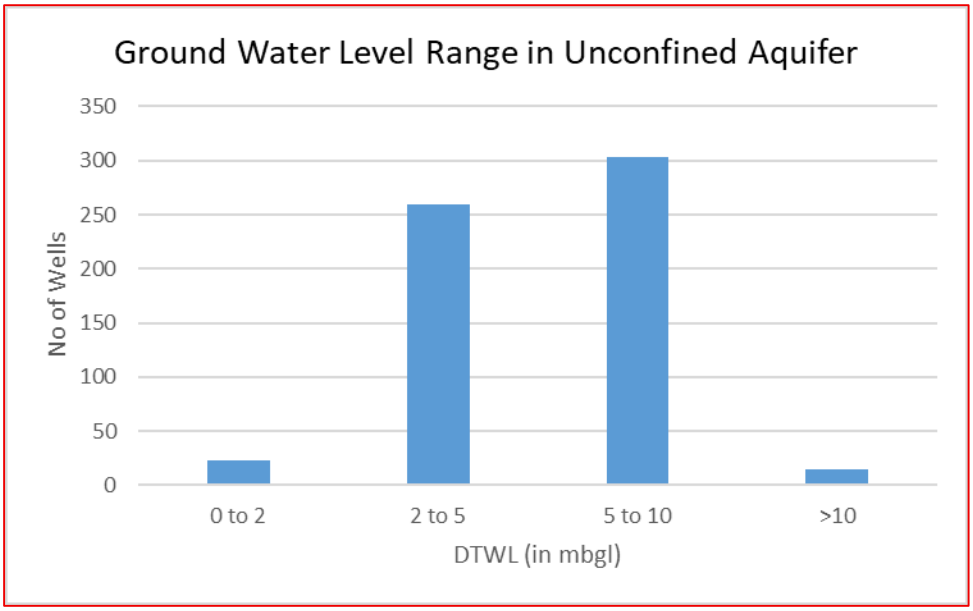

Figure 5- Graph showing Depth to Water level of Monitoring Stations (Dugwells) Bihar

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

The annual fluctuation in water levels within the unconfined aquifer (from May 2024 to May 2025) was analyzed using data from 528 dug wells, with 305 wells (58%) showing a rise in water level and 223 wells (42%) showing a decline.

Rise in Water Levels:

Out of 528 dug wells, 305 wells are showing a rise in water levels, and out of these 305 wells, 95% are showing a rise of less than 2 meters, 4% are showing a rise between 2 to 4 meters, and only 1% of wells are showing a rise of more than 4 meters. A rise of less than 2 meters is mainly observed in parts of Araria, Kishanganj, Purnea, Katihar, Sheohar, Sitamarhi, East Champaran, and West Champaran districts. The rise of 2 to 4 meters is primarily observed in Kaimur, Rohtas, Nawada, and Nalanda districts. The rise of over 4 meters is observed in wells located in Kaimur, Rohtas, and Nalanda districts.

Fall in Water Levels:

Out of 528 dug wells, 223 wells are showing a fall in water levels, and out of these 223 wells, 88% of wells are showing a fall of less than 2 meters, 9% are showing a fall between 2 to 4 meters, and only 3% of wells are showing a fall of more than 4 meters. A fall of less than 2 meters is observed across all districts, significantly in Saran, Vaishali, Muzaffarpur, Samastipur, Aurangabad, and Gaya districts. The 9% of wells showing a fall of 2 to 4 meters are primarily located in Bhagalpur, Buxar, and Sheikhpura districts. The fall of over 4 meters is observed in wells located in Jamui, Munger, and Samastipur districts.

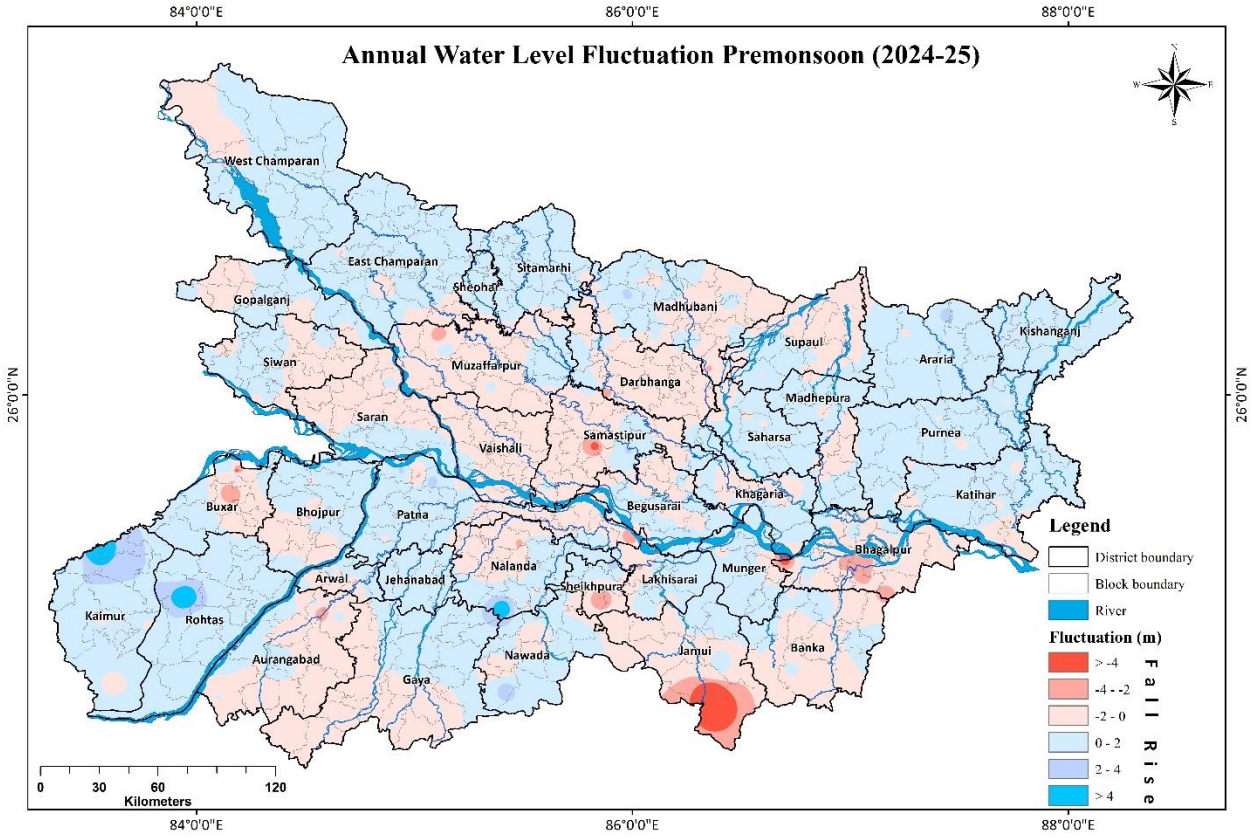

Figure 6-Map showing Annual Water level fluctuation map of unconfined aquifer of Bihar

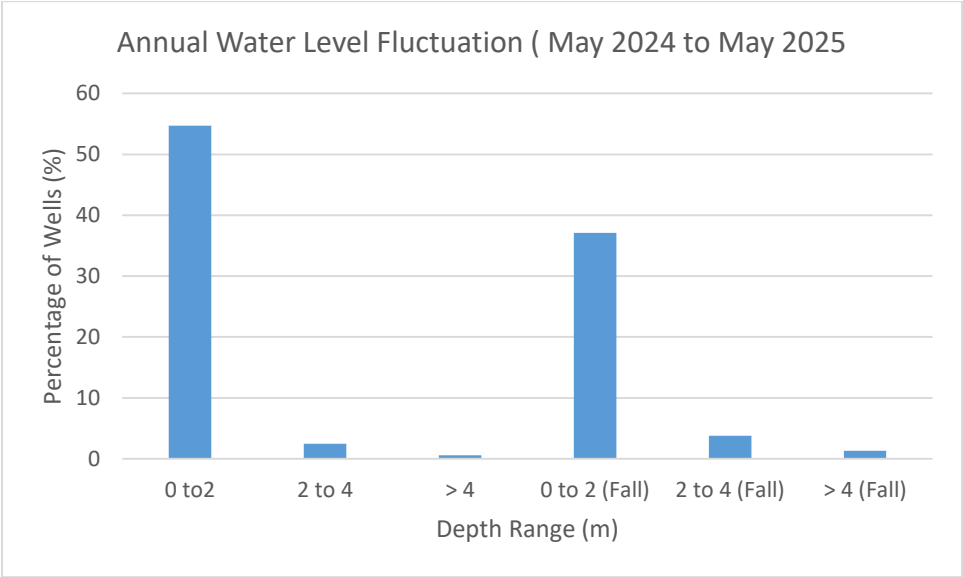

Figure 7- Chart showing Annual Water level fluctuation of Monitoring Stations (Dugwells) Bihar

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

Fluctuation of water level in the unconfined aquifer between May 2023 and May 2025 has been analyzed from 517 dug wells. Out of these, 286 (55%) wells show a rise in water level, and 231 (45%) wells show a fall in water level.

Rise in Water Levels:

Out of 517 dug wells, 286 wells are showing a rise in water levels, and out of these 286 wells, 91% of wells are showing a rise of less than 2 meters, 7% are showing a rise between 2 to 4 meters, and only 2% of wells are showing a rise of more than 4 meters. A rise of less than 2 meters is mainly observed in parts of Araria, Supaul, Banka, Munger, Madhepura, Saharsa, and West Champaran districts. The rise of 2 to 4 meters is primarily observed in Kaimur, Buxar, Jamui, and Nalanda districts. The rise of over 4 meters is observed in wells located in Kaimur and Nalanda districts.

Fall in Water Levels:

Out of 517 dug wells, 231 wells are showing a fall in water levels, and out of these 231 wells, 93% of wells are showing a fall of less than 2 meters, while the remaining 6% are showing a fall between 2 to 4 meters, and only 1% of wells are showing a fall of more than 4 meters. A fall of less than 2 meters is observed across all districts, significantly in Saran, Muzaffarpur, Gaya, Rohtas, Nawada, and Samastipur districts. The 8% of wells showing a fall of 2 to 4 meters are primarily located in Gaya, Bhagalpur, Lakhisarai, and Buxar districts.

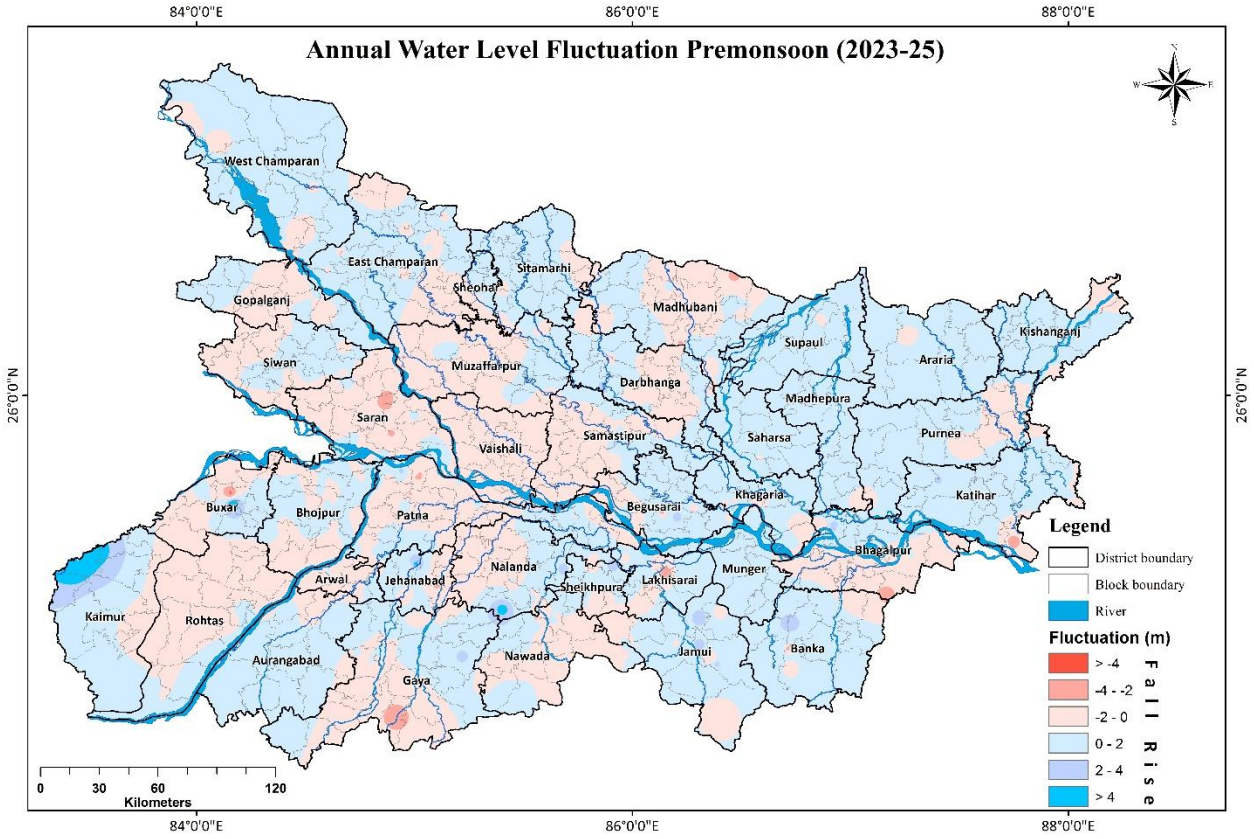

Figure 8-Map showing Annual Water level fluctuation map (May 2023 – May 2025) of unconfined aquifer of Bihar

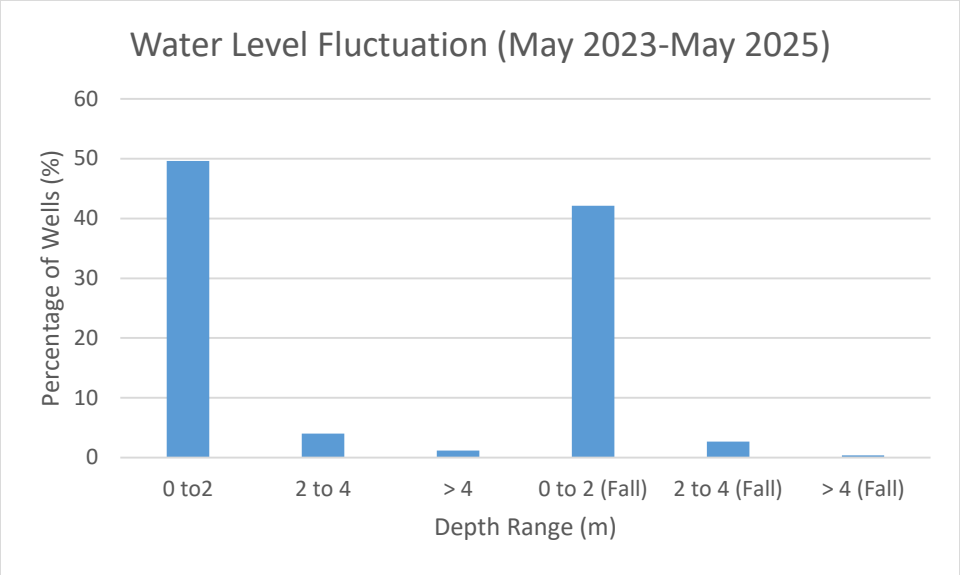

Figure 9- Chart showing Annual Water level fluctuation of Monitoring Stations (Dugwells) Bihar

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

Decadal fluctuation of water level in the unconfined aquifer (Decadal Mean May 2015–2024 to May 2025) has been analyzed from 476 dug wells. Out of these, 220 (46%) wells are showing a rise in water level, and 256 (54%) wells are showing decline in water level.

Rise in Water Levels:

Out of 476 dug wells, 220 wells are showing a rise in water levels. Out of these 220 wells, a water level rise of less than 2 meters is seen in 90% of the wells, 2 to 4 meters in 8% of the wells, and more than 4 meters in 2% of the wells. A water level rise of less than 2 meters is observed across all districts, significantly in Purbi Champaran, Paschim Champaran, Araria, Katihar, Kishanganj, Lakhisarai, and Rohtas districts, while a rise of 2 to 4 meters is significantly observed in Aurangabad, Rohtas, and Munger districts

Fall in Water Levels:

Out of the 476 wells, 256 wells are showing a fall in water levels. Out of these 256 wells, 95% are showing a fall of less than 2 meters, 4% are showing a fall in the range of 2 to 4 meters, and the remaining 1% of wells are showing a fall of more than 4 meters. A fall of less than 2 meters is observed in all districts, mainly in parts of Gaya, Nalanda, Patna, Samastipur, Saran, and Nawada districts. A fall beyond 2 meters is mainly observed in Saran, Samastipur, and Bhagalpur districts.

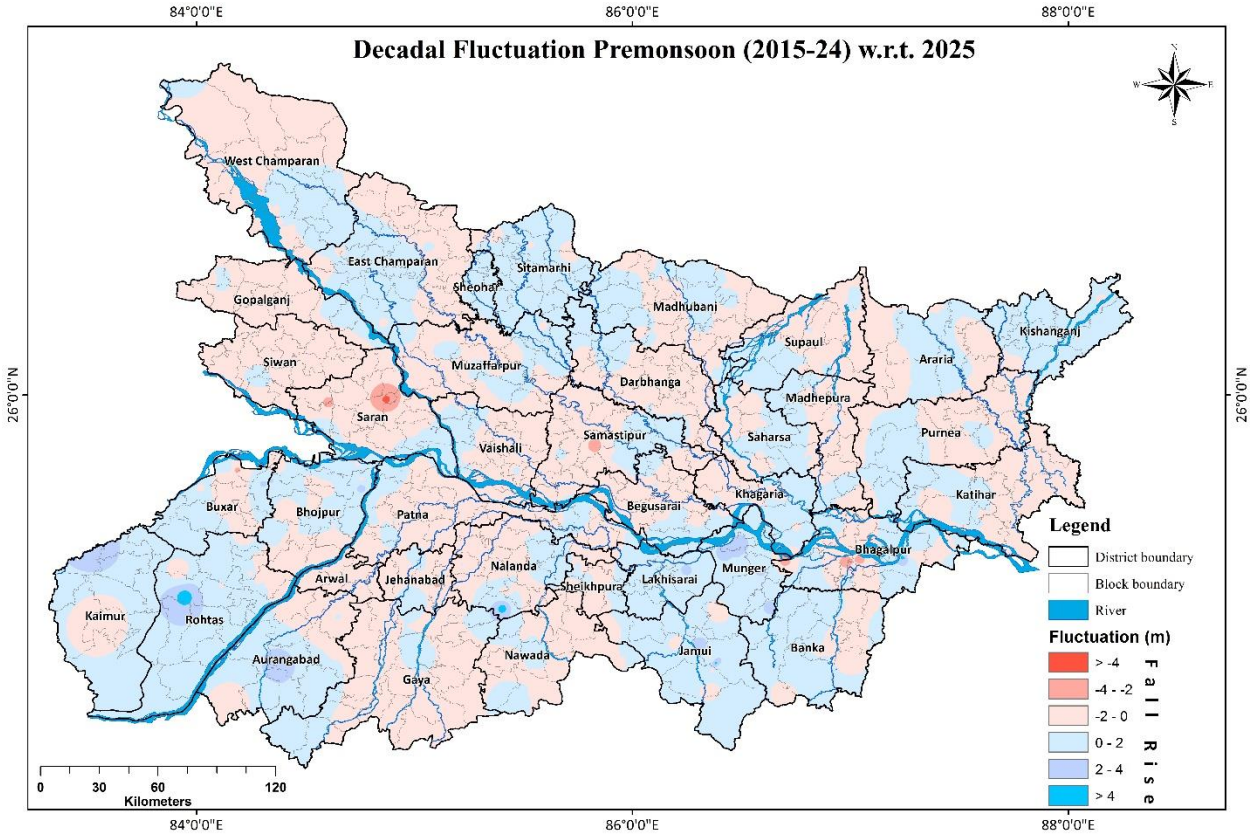

Figure 10- Map showing Decadal Water level fluctuation map of unconfined aquifer of Bihar

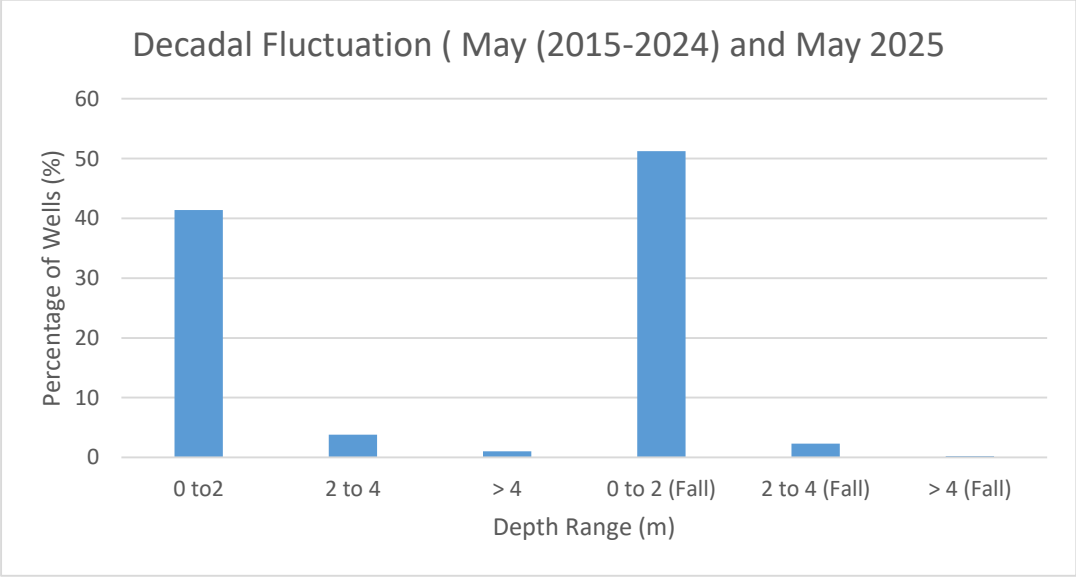

Figure 11- Chart showing Decadal Water level fluctuation of unconfined aquifer of Bihar

Summary

As a component of the National Ground Water Monitoring Programme, the CGWB, MER, Patna conducts monitoring of the groundwater conditions on a quarterly basis. The water levels range from 0.9 mbgl in Nalanda district to 16.8 mbgl in Bhagalpur district. About 3% of the wells have a water level of less than 2 mbgl, 43% of the wells have water levels between 2 to 5 mbgl, and 54% have water levels greater than 5 mbgl. Over the period from May 2023 to May 2024, 305 wells are showing a rise in water levels, with 95% of these showing a rise of less than 2 meters, especially in Araria, Kishanganj, Purnea, and Katihar. In contrast, 223 wells are showing a decrease, mostly under 2 meters, in districts like Jamui, Vaishali, and Samastipur. Over the past decade (2015–2024), 220 wells are showing a rise in water levels, predominantly under 2 meters, with significant rise in Rohtas, Aurangabad, and Jamui, while 256 wells are showing a fall, mainly under 2 meters, in areas like Saran and Gaya.

Recommendations:

Based on the observed groundwater level fluctuations across Bihar, the following recommendations are proposed to ensure sustainable water resource management:

- Encourage rainwater harvesting in urban and rural areas to improve groundwater recharge.
- Conduct awareness campaigns on water conservation techniques.
- Participatory groundwater management may be encouraged to ensure sustainable resource use.