



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
केंद्रीय भूमि जल बोर्ड

Government of India

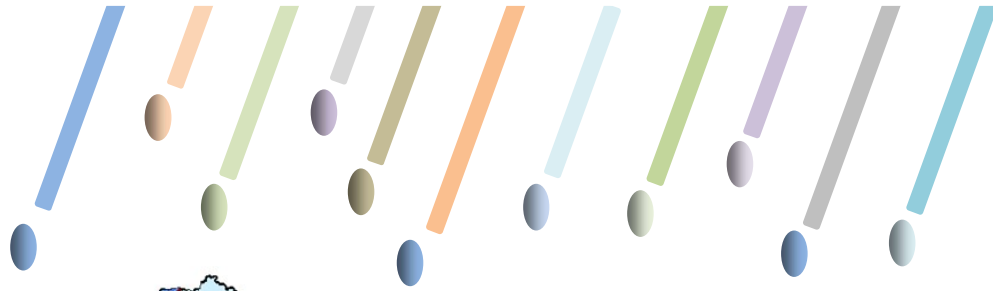
Ministry of Jal Shakti

Department of Water Resources, River Development and Ganga Rejuvenation

Central Ground Water Board

वार्षिक भूजल पुस्तिका, बिहार

Ground Water Year Book, Bihar



Year 2021- 22

मध्य पूर्वी क्षेत्र
लोक नायक जय प्रकाश भवन , फ्रेज़र, रोड, पटना – 01
Mid-Eastern Region
Lok Nayak Jai Prakash Bhawan, Fraser Road, Patna- 01

सितंबर 2022
September 2022



भारत सरकार
Government of India
जल शक्ति मंत्रालय
Ministry of JAL Shakti
केंद्रीय भूमि जल बोर्ड
Central Ground Water Board

**वार्षिक भूजल पुस्तिका, बिहार
(2021-2022)**

**GROUND WATER YEAR BOOK, BIHAR
(2021 - 2022)**

**मध्य पूर्वी क्षेत्र, पटना
MID-EASTERN REGION, PATNA**

September 2022

GROUND WATER YEAR BOOK, BIHAR

(2021-22)

Table of Contents

ABSTRACT.....	vi
1. INTRODUCTION.....	1
2. HYDROGEOLOGY	1
3. GROUND WATER SCENARIO.....	4
3.1 DEPTH TO WATER LEVEL.....	8
3.1.1 May 2021	8
3.1.2 August 2021	9
3.1.3 November 2021.....	12
3.1.4 January 2022	14
3.2 SEASONAL FLUCTUATION.....	16
3.2.1 May 2021 to August 2021.....	16
3.2.2 May 2021 to November 2021	18
3.2.3 May 2021 to January 2022.....	20
3.3.0 ANNUAL FLUCTUATION.....	22
3.3.1 May 2020 to May 2021	22
3.3.2 August 2020 to August 2021	23
3.3.3 November 2020 to November 2021	25
3.3.4 January 2021 to January 2022.....	27
3.4 DECADAL FLUCTUATION.....	29
3.4.1 Decadal Mean of May to May 2021	29
3.4.2 Decadal Mean of August to August 2021	31
3.4.3 Decadal Mean of November to November 2021	33
3.4.4 Decadal Mean of January to January 2022	35
4. HYDROCHEMISTRY	37
5. RAINFALL DATA ANALYSIS	40
6. TREND ANALYSIS DURING PRE AND POST MONSOON	41

List of Tables

Table 1: Generalized Geological Succession of Bihar.	1
Table 2: District wise distribution of the HNS as on March 31.03.21.....	6
Table 3: HNS monitoring schedule	7
Table 4: Number of HNS monitored/analysed during different months.....	7
Table 5: District wise well frequency for different ranges of depth to water level of HNS in May. 2021 in Bihar state .	9
Table 6: District wise well frequency for different ranges of depth to water level of HNS in August. 2021 in Bihar state	11
Table 7: District wise well frequency for different ranges of depth to water level of HNS in Nov. 2021 in Bihar state	13
Table 8: District wise well frequency for different ranges of depth to water level of HNS in Jan. 2021 in Bihar state	15
Table 9: District wise categorization of fluctuation and their frequency of water levels of HNS in Aug. 2021 w.r.t. May 2021	17
Table 10: District wise categorization of fluctuation and their frequency of water levels of HNS in Nov. 2021 w.r.t. May 2021	19
Table 11: District wise categorization of fluctuation and their frequency of water levels of HNS in Jan. 2022 w.r.t. May 2021	21

Table 12: District-wise categorization of frequency and fluctuation water levels of HNS of May. 2021 w.r.t. May. 2020 for Bihar State	23
Table 13: District-wise categorization of frequency and fluctuation water levels of HNS of Aug. 2021 w.r.t. Aug. 2020 for Bihar State	24
Table 14: District-wise categorization of frequency and fluctuation water levels of HNS of Nov. 2021 w.r.t. Nov. 2020 for Bihar State	26
Table 15: District-wise categorization of fluctuation and their frequency of water levels of HNS of Jan 2022 w.r.t. Jan 2021 for Bihar State	28
Table 16: District-wise categorization of fluctuation and their frequency of water levels of HNS of May. 2021 w.r.t. May mean (2011-2020) for Bihar State	30
Table 17: District-wise categorization of fluctuation and their frequency of water levels of HNS of Aug. 2021 w.r.t. Aug. mean (2011-2020) for Bihar.....	32
Table 18: District-wise categorization of fluctuation and their frequency of water levels of HNS of Nov. 2021 w.r.t. Nov. mean (2011-2020) for Bihar State	34
Table 19: District-wise categorization of fluctuation and their frequency of water levels of HNS of Jan. 2022 w.r.t. Jan. mean (2012-2021) for Bihar State	36
Table 20: Calculated Minimum & Maximum and Median value of Chemical Parameters	37

List of Figures

Figure 1: Administrative Map of Bihar state	2
Figure 2: Hydrogeological Map of Bihar state	4
Figure 3: Location of Hydrograph Network Stations in Bihar State, 2021	5
Figure 4: Depth to water level in May 2021	8
Figure 5: Depth to water level in August 2021	10
Figure 6: Depth to water level in November 2021	12
Figure 7: Depth to water level in January 2022	14
Figure 8: Water level Fluctuation between May 2021 and August 2021	16
Figure 9: Fluctuation in ground water level between May 2021 and Nov. 2021.	18
Figure 10: Fluctuation in ground water level between May 2021 and Jan. 2022.....	20
Figure 11: Fluctuation in ground water level between May 2020 and May 2021.....	22
Figure 12: Fluctuation in ground water level between Aug. 2020 and Aug. 2021.....	24
Figure 13: Fluctuation in ground water level between Nov 2020 and Nov. 2021.....	25
Figure 14: Fluctuation in ground water level between Jan. 2020 and Jan. 2021.....	27
Figure 15: Fluctuation in water level between May (mean) and May 2021.....	29
Figure 16: Fluctuation in water level between Aug. (mean) and Aug. 2021	31
Figure 17: Fluctuation in water level between Nov. (mean) and Nov. 2021	33
Figure 18: Fluctuation in water level between Jan. (mean) and Jan. 2022.....	35
Figure 19: Box and Whisker Plot	37
Figure 20: Electrical Conductivity Map.....	38
Figure 21: Bi-carbonate Map	39
Figure 22: District Rainfall Departure Map.....	40

ANNEXURE

- I. Depth to water levels (m bgl) in the months of May' 21, August '21, November '21, and January '22 in Bihar State.
- II. Piezometric Head
- III. Major chemical parameters of ground water samples of HNS collected during pre-monsoon 2021 in Bihar State.
- IV. District-wise percentage of well showing rise, fall or no significant trend during pre-monsoon and post-monsoon season of (2011-20).

GROUND WATER YEAR BOOK, BIHAR (2021 –2022)

List of Contributors

DATA COLLECTION

Singaren Sandeep Purty, Sc – C
Sanjiv Chakrabarty- Sc – B
Alok Kumar Sinha, Sc – B
Pankaj Kumar, Sc – B
Santosh Kumar Sen, AHG
Siperna Nayak, AHG
Suresh Kumar, Asst. Chemist
Divya Kujur, STA (HG)
P. K. Singh, Chief Draftsman
Gyandev Paswan, Officer Surveyor
Nirmal Kumar, Sr. Surveyor
A.C. Saurabh, Sr. Surveyor
Shipra Kumari, Young Professional
Amen Rashid, Young Professional
Arya Mishra, Young Professional

HYDROGEOCHEMISTRY

Ms. Manasi Bhattacharya, Scientist – ‘B’
Shri Suresh Kumar, Asst. Chemist
Ms Shelja Tiwari, Asstt. Chemist
Mr. Anurag Shukla, STA (Chem.)

MAP & TABLES PREPARATION

Santosh Kumar Sen
Assistant Hydrogeologist

Vishal Srivastava
Scientist – ‘B’

Singaren Sandeep Purty
Scientist – ‘C’

CHEMICAL FIGURES & GRAPHS

Ms Shelja Tiwari
Assistant Chemist

ISSUANCE

Report Processing Cell
CGWB, MER, Patna

GROUND WATER YEAR BOOK, BIHAR (2021-2022)

ABSTRACT

Monitoring of ground water levels from 768 (745+23) Hydrograph Network Stations (HNS) were carried out in the year 2021-2022 with an objective to assess ground water regime of phreatic aquifer. The water level monitoring was carried out manually in the months of May'19, August'19, November'19, and January'20. The ground water samples from the HNS were collected in the month of May'21 for chemical analysis. The water level in the HNS represented phreatic aquifer. **During the year 2021-2022, water level monitoring has been badly affected by Covid-19 pandemic.**

The observed water level data had been grouped into four categories viz. 0-2 m, 2-5 m, 5-10 m and >10 m. Thematic maps depicting ground water levels measured in different periods, has been prepared. The water levels has been further analysed for study of its change with respect to measurement of pre-monsoon period of the same year, previous year water level data of the same period and decadal mean water level data of the same period. The fluctuation had been grouped under rise and fall categories. In each category there are three groups viz. 0-2 m, 2-4 m and >4 m. Thematic maps had been prepared for each category of fluctuation.

During pre-monsoon 2021 the ground water levels were found to vary between 0.74 and 11.00 m bgl. The depth to water level rests in range of 2-5 m bgl is 49% of HNS, which spatially covered the major part of the area monitored. The depth to water level rests in range up to 2 m bgl spatially covered mainly southern part of North Bihar Plains (NBP) and at disseminated locations in (SBP). During post-monsoon 2021, water level rested in the range up to 2 m bgl in 55% of the HNS which covers major part of the Bihar State. The fluctuation of water level between pre and post-monsoon 2021 indicated rise in water level in 72% of the HNS. Annual change of water level of May 2021 with respect to May 2020 indicated rise in water level in 85% of the HNS, and during November 2019 with respect to November 2018 indicated rise in 72% of the HNS. The change in water level of May 2019 with respect to the decadal mean of May (May 2011 to May 2020) indicated rise in 89% of the HNS and during November 2019 with respect to the decadal mean of November (November 2011 to November 2020) indicated rise in 82% of HNS.

GROUND WATER YEAR BOOK, BIHAR (2021-2022)

1. INTRODUCTION

Bihar state lies between 83° 20' and 88° 00' E Longitudes and 24° 15' and 27° 23' N Latitudes. 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 is divided into 38 districts and 534 community development blocks. The population of the State is 10.41 crores (2011 census). Population density is 881persons/Sq.km. The urban population is 11,758,016 and rural population is 92,341,436. There are 150 small and large towns in the state. The distribution of urban population is highly skewed as only three towns namely Gaya, Bhagalpur, and Muzaffarpur are having population of more than 3 lakhs, besides urban population of Patna urban agglomeration which is having 1,683,200.

2. HYDROGEOLOGY

Generalized stratigraphic succession of the state is presented in **Table 1**. The hydrogeological map of Bihar is depicted in **Fig 2**.

Table 1: Generalized Geological Succession of Bihar.

<i>Age</i>	<i>Formation</i>	<i>Broad Lithology</i>
Quaternary	Alluvial Deposits	Sand, clay, silt and occasional gravel
Tertiary	Siwaliks	Sandstone, conglomerate, clay stone, gravel
L-Cambrian	Vindhyan Super Group	Sandstone, limestone.
Proterozoic	Chotanagpur Granite Gneiss	Granite, granitic-gneiss, schist, phyllites, dolomites, basic rocks, amphibolites.
Archean	Bihar Mica belt	Gneiss, Pegmatites etc.,

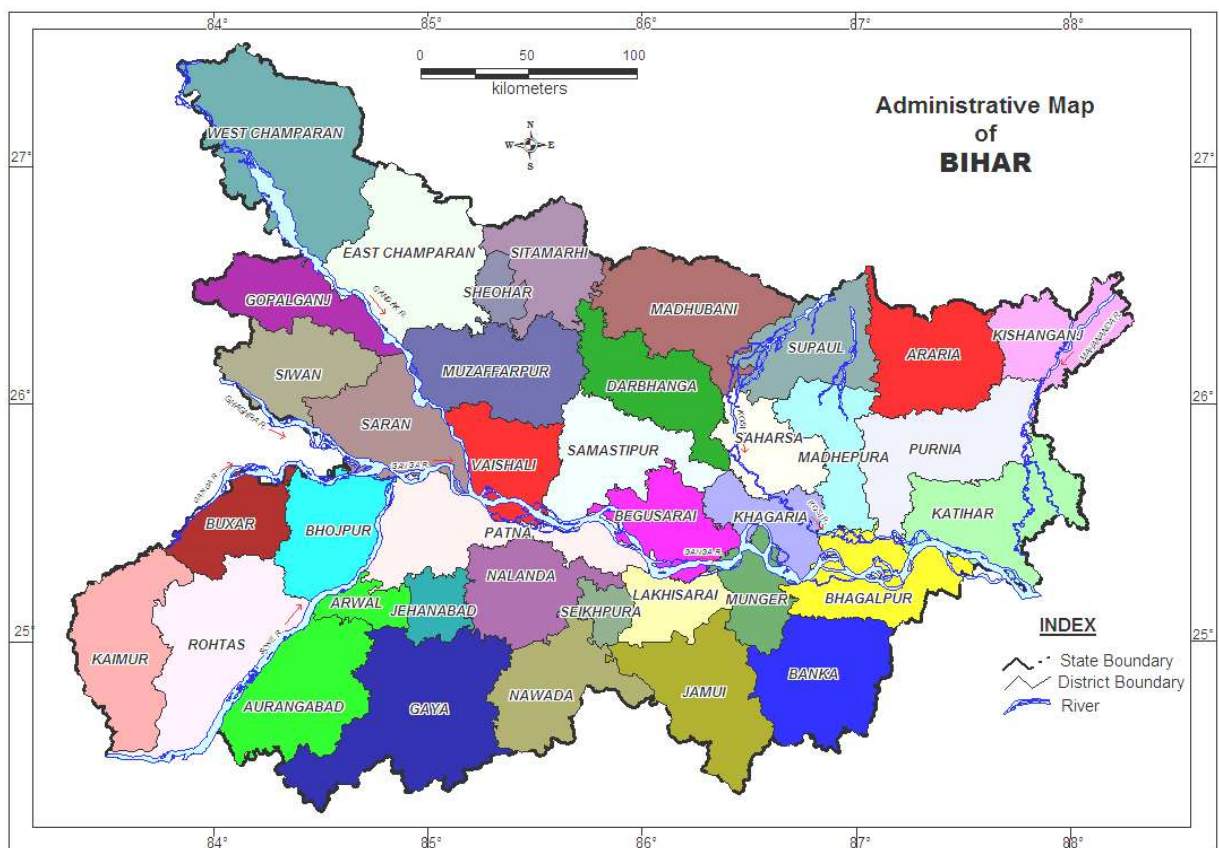


Figure 1: Administrative Map of Bihar state

Pre-cambrians

The rocks belonging to Proterozoic and Archean age are granite, granitic-gneiss, quartzite, phyllites, slates, and metabasics. Rocks of Chhotanagpur Granite Gneissic Complex (CGGC) suit occur in the form of small strip in the districts bordering Jharkhand state. Meta-basic rocks intrude the Chhotanagpur Granite Gneiss Complex suit of rocks. Mica bearing pegmatite of Bihar Mica Belt has been found in Gaya, Nawada and Munger districts. In parts of Munger, Gaya and Nawada districts the meta-sedimentary rocks (viz. phyllite, schist and quartzite) of Pre-cambrian age are also found.

The occurrence and movement of ground water is controlled by the thickness and nature of weathered mantle and saprolite zone (a transition zone between weathered residuum and fresh basement), besides fractures lying underneath the weathered residuum. Thickness of the weathered zone usually ranges from 5 to 20 m. Thickness of weathered zone are more in schist and other meta-sedimentary rocks in comparison to the granite-gneiss. The weathered product of granite and granite-gneiss is marked by presence of coarse granular materials composed of quartz and feldspar, whereas those of schist and phyllite by clayey materials.

Ground water occurs under unconfined condition within the weathered mantle and saprolite zone. In the secondary porosities imparted by joints, cracks and fractures, ground water occurs under confined to semi-confined conditions.

Vindhyan

Rocks of Vindhyan Super-group are confined in the west and north of the river Sone and forms eastern end of the Kaimur Plateau. It occurs in the parts of Rohtas, Kaimur and Aurangabad districts. The width of the Vindhyan rocks becomes less than 3 km near Sasaram in Rohtas district. Rocks found under this super-group are mainly sandstone, limestone, quartzite and schist. These rocks behave as consolidated formation and have remained unaffected by any large-scale tectonic disturbances, except faulting at a few places in the geological past. Vindhyan sandstones are compact and have low primary porosity. Ground water in this occurs within the weathered residuum and in the secondary porosity below them. Ground water occurs under unconfined condition in the weathered mantle. The thickness of the weathered residuum varies from 5 to 10 m.

Siwaliks

The Siwaliks of Upper Tertiary age occur as small patches in northwestern corner of the state in West Champaran district bordering Nepal. It consists of sandstone, conglomerate, red clay and spongy limestone and forms structural hills with a number of faults crisscrossing them. Ground water occurs under confined conditions in sandstones disposed at depth.

Quaternary alluvium

Quaternary sediments of Recent to Sub-Recent age cover about 89 percent of the geographical area of the state. They occupy entire north Bihar plain, and a vast stretch of land between south of the river Ganga and the Chhotanagpur Plateau. Deep exploratory drilling by Central Ground Water Board has confirmed thickness of sedimentary deposits in north Bihar plain as more than three hundred meter. In the south of the river Ganga, the alluvial thickness gradually decreases to as low as 50 m or even less, towards the area bordering the Jharkhand state. The sedimentary deposit consists of alternate sequences of sand and clay layers representing multi-cyclic nature of sedimentation. The Quaternary alluvial deposit spread over south and north of the river Ganga is a part of Mid-Ganga Plain. The Terai belt, which is demarcated by auto-flow wells, occurs as a narrow strip in the bordering areas in Madhubani, Darbhanga, and West Champaran districts. It is an extension of Terai belt of Nepal which coalesces with alluvial plain. Ground water occurs under unconfined conditions in the phreatic aquifer, which is generally disposed within 70 m below ground. Aquifers situated at deeper levels have ground water levels under confined condition.

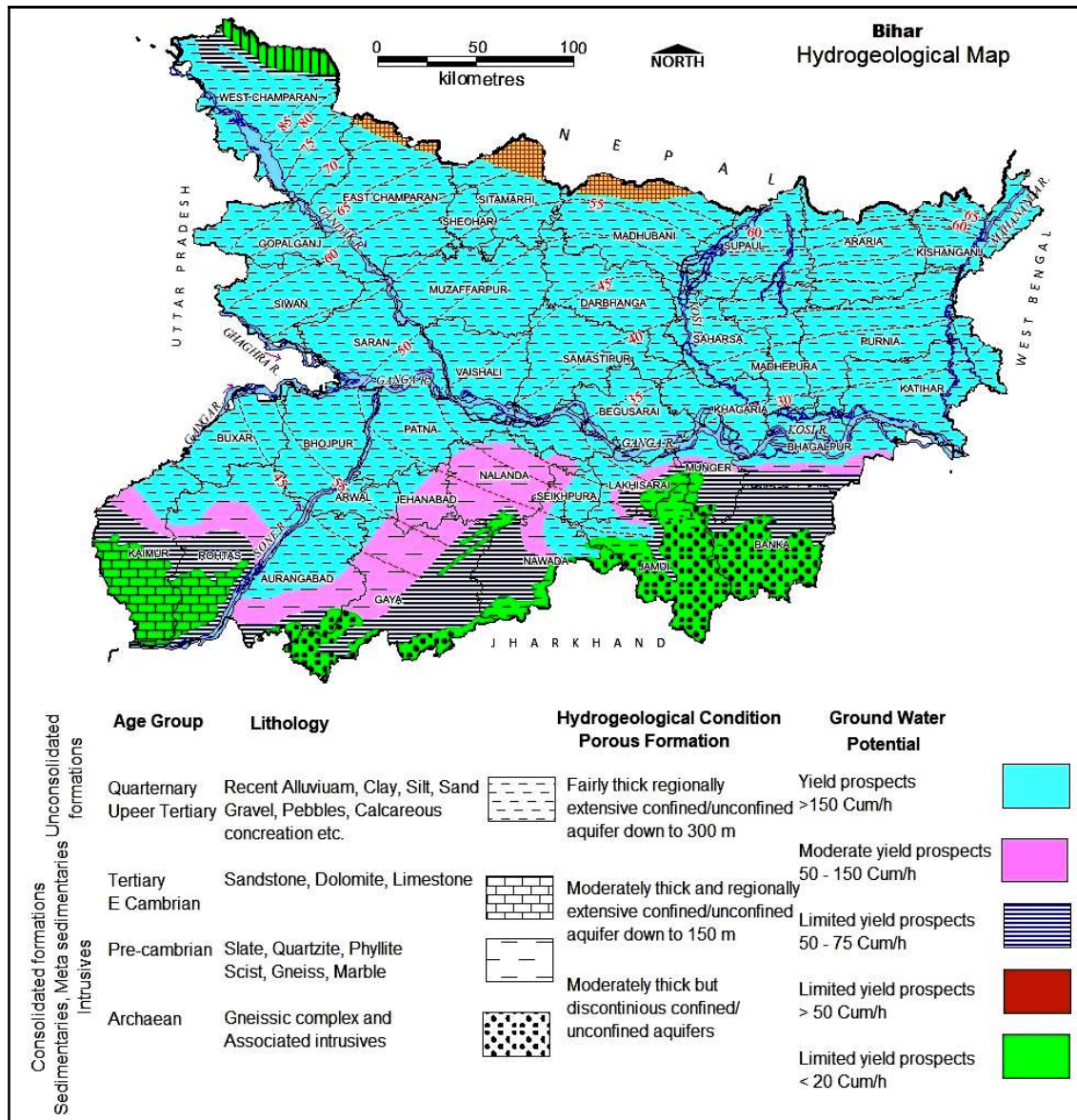


Figure 2: Hydrogeological Map of Bihar state

3. GROUND WATER SCENARIO

A total of 733 Hydrograph Network Stations (HNS) which are dug wells tapping phreatic aquifer have been monitored as a part of ground water regime monitoring in the state of Bihar. Majority of the wells represent phreatic alluvial aquifer. The district wise location and distribution of the HNS are given in **Fig 3** and **Table 2** respectively.

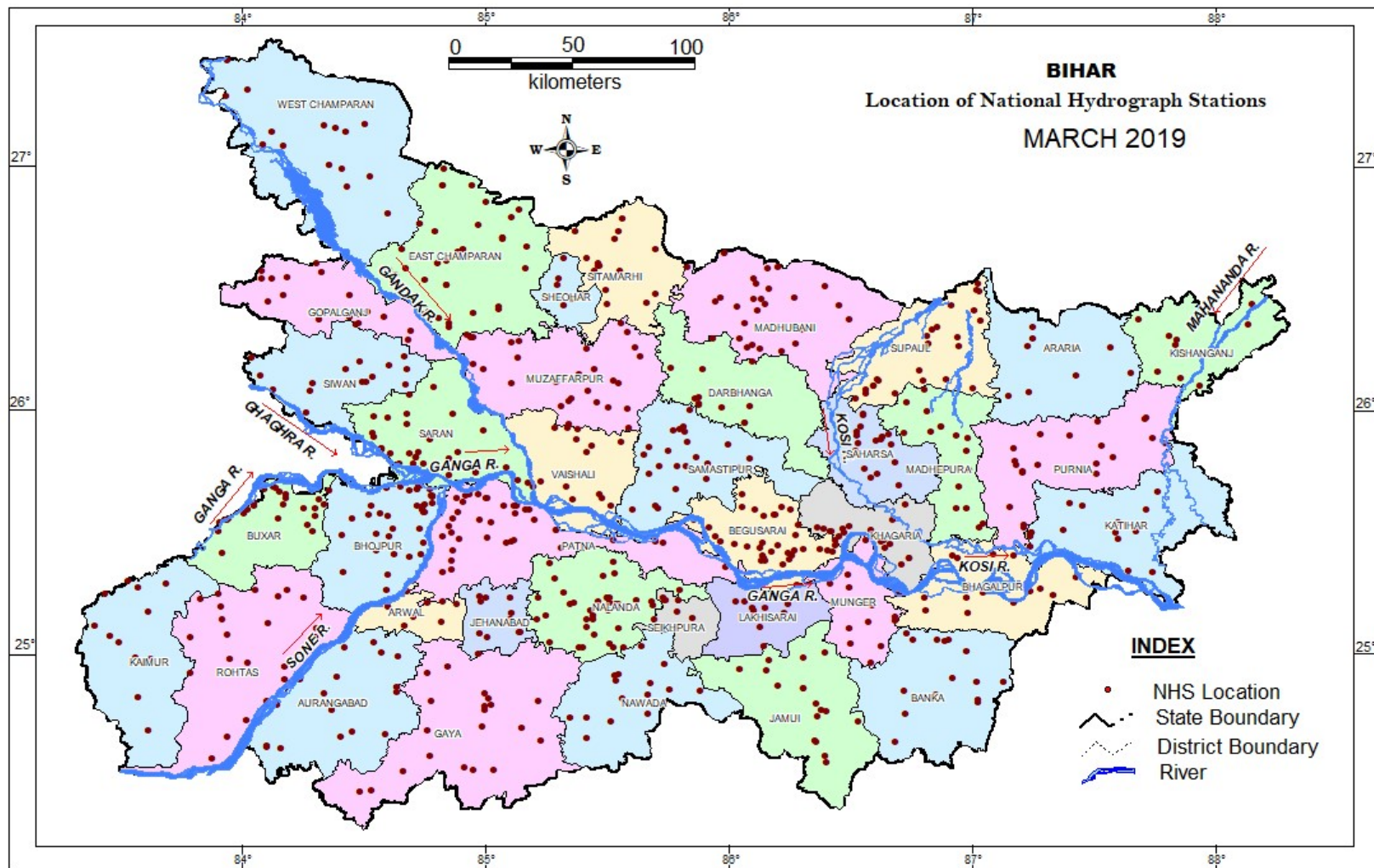


Figure 3: Location of Hydrograph Network Stations in Bihar State, 2021

Table 2: District wise distribution of the HNS as on March 31.03.21

SN	District	DW*	Pz
1	Araia	8	3
2	Aurangabad	16	
3	Banka	16	
4	Begusarai	36	
5	Bhagalpur	14	
6	Bhojpur	36	
7	Buxar	25	
8	Darbhanga	11	
9	Gaya	21	
10	Gopalganj	22	
11	Jamui	17	
12	Jehanabad & Arwal	18	
13	Kaimur/Bhabhua	12	
14	Katihar	20	
15	Khagaria	19	
16	Kishanganj	9	
17	Lakhisarai	9	
18	Madhepura	22	
19	Madhubani	26	
20	Munger	10	
21	Muzaffarpur	26	
22	Nalanda	39	
23	Nawada	16	
24	W Champaran	14	
25	Patna	35	20
26	E Chamaparan	34	
27	Purnia	22	
28	Rohtas	19	
29	Saharsa	18	
30	Samastipur	24	
31	Saran	30	
32	Sheikhpura	10	
33	Sheohar	5	
34	Sitamarhi	16	
35	Siwan	20	
36	Supaul	25	
37	Vaishali	25	
Total		745	23

*DW=Dug well
Pz = Peizometer

The numbers of HNS monitored in the state as per the following monitoring schedules:

Table 3: HNS monitoring schedule

Sl. N.	Month	Date	Period
1	May	20 – 30	Pre-monsoon
2	August	20 – 30	Mid-monsoon
3	November	1 – 10	Post-monsoon
4	January	1 – 10	Recession

The Number of HNS monitored during the various monitoring period is given in **Table-4**. The water level data of HNS are presented in the Annexure I. The monitoring work has been badly affected by the **Covid-19 pandemic** during the month of May 2021. The observed data were analysed for each set of measurement and the thematic presentation of depth to water level and its fluctuations have been prepared in the range of 0 – 2 m, 2 – 5 m, 5 – 10 m and more than 10 m using GEMS software. Bihar state has been broadly divided into North Bihar Plain (NBP) consisting of areas falling to the north of the river Ganga and South Bihar Plain (SBP) consisting of areas falling to the south of the river Ganga and bordering Jharkhand state.

Table 4: Number of HNS monitored/analysed during different months

State	May'21	August'21	November'21	January'22
Bihar	225	560	615	640

3.1 DEPTH TO WATER LEVEL

3.1.1 May 2021

During Pre- Monsoon period (May 2021), 225 HNS were analysed. The water level data observed has been ranged from 0.02 (Patna) to 11.00 m bgl (Nawada) m bgl. The Major part of the area covered under monitoring has shown depth to water level within 2 to 5 m. Shallowest category of upto 2 m has been observed in northern part and as patches in SBP also. Majority of the NHS in deepest category of 10-20 m depth to water level has been recorded in Bhojpur, Buxar and Nawada district.

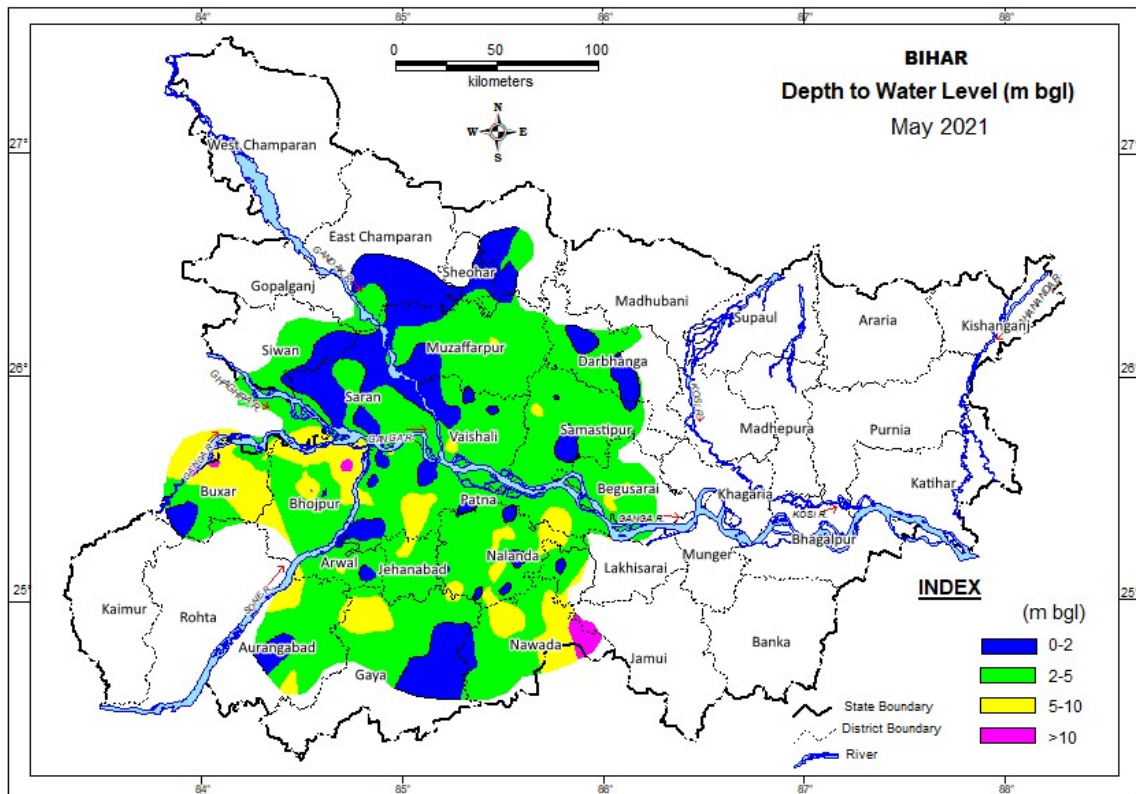


Figure 4: Depth to water level in May 2021

Table 5: District wise well frequency for different ranges of depth to water level of HNS in May, 2021 in Bihar state												
SN	District	No. of Wells analysed	Depth to water level (m bgl)		0-2 m		2-5 m		5-10 m		10-20 m	
			Min.	Max.	No.	%	No.	%	No.	%	No.	%
1	Aurangabad	5	0.60	5.60	1	20	2	40	2	40	0	0
2	Begusarai	8	2.89	6.16	0	0	6	75	2	25	0	0
3	Bhojpur	23	1.80	10.15	2	9	8	35	11	48	2	9
4	Buxar	20	1.75	10.75	1	5	8	40	9	45	2	10
5	Darbhanga	6	0.30	3.88	2	33	4	67	0	0	0	0
6	Gaya	6	0.80	10.00	2	33	2	33	2	33	0	0
7	Jehanabad	10	1.43	5.25	3	30	5	50	2	20	0	0
8	Muzaffarpur	15	0.61	5.15	4	27	10	67	1	7	0	0
9	Nalanda	32	0.30	7.50	7	22	17	53	8	25	0	0
10	Nawada	14	1.59	11.00	1	7	6	43	6	43	1	7
11	Patna	26	0.02	6.17	11	42	9	35	6	23	0	0
12	E Champaran	3	0.64	2.83	2	67	1	33	0	0	0	0
13	Samastipur	14	1.33	5.50	3	21	9	64	2	14	0	0
14	Saran	11	0.20	4.22	6	55	5	45	0	0	0	0
15	Sheikhupura	5	1.54	5.93	1	20	3	60	1	20	0	0
16	Sitamarhi	6	0.94	2.10	4	67	2	33	0	0	0	0
17	Siwan	3	1.36	2.35	1	33	2	67	0	0	0	0
18	Vaishali	18	0.74	5.75	5	28	12	67	1	6	0	0
	Total	225	0.02	11.00	56	25	111	49	53	24	5	2

3.1.2 August 2021

Total 560 NHS has been analysed where depth to water level ranged from 0.05 (Gopalganj) to 11.4 m bgl (Bhagalpur). Except for a few locations in Muzaffarpur district, the depth to water level has been observed less than 2 m bgl in which covered major part of the monitored area in western part of NBP. Major part of the monitored area in eastern part of NBP and SBP has shown water level between 2 and 5 m bgl. However, deeper water level has also been observed a few locations in SBP, notably Jamui, Nawada, Rohtas and Kaimur.

In Nawada and Jamui district, deeper water level category (> 5 m bgl) has been recorded in 20% and 27% of the NHS respectively. Three wells, located in Aurangabad, Bhagalpur, Rohtas has shown water level > 10 m bgl.(Fig. 5; Table 6)

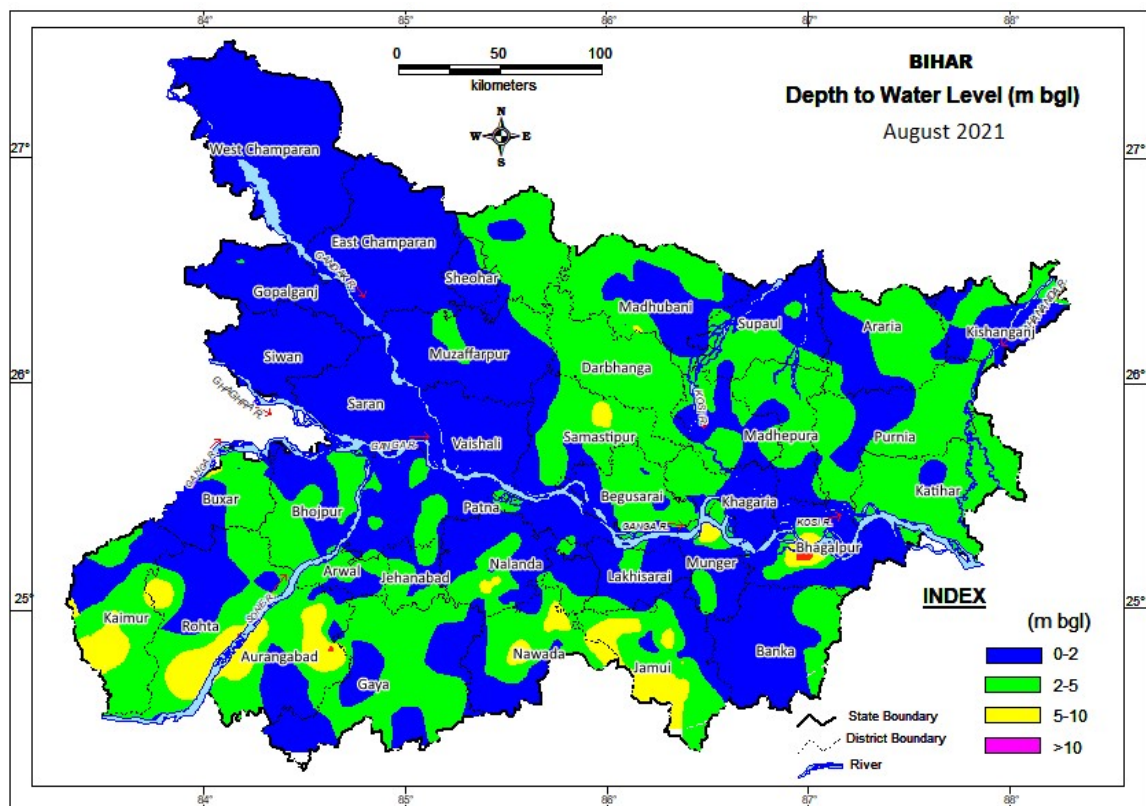


Figure 5: Depth to water level in August 2021

Table 6: District wise well frequency for different ranges of depth to water level of HNS in August. 2021 in Bihar state												
SN	District	No. of Wells analysed	Depth to water level (m bgl)		0-2 m		2-5 m		5-10 m		10-20 m	
			Min.	Max.	No.	%	No.	%	No.	%	No.	%
1	Araria	8	1.63	2.55	3	38	5	63	0	0	0	0
2	Aurangabad	17	0.3	10.25	8	47	6	35	2	12	1	6
3	Banka	13	0.58	4.27	10	77	3	23	0	0	0	0
4	Begusarai	33	0.85	3.96	13	39	20	61	0	0	0	0
5	Bhagalpur	11	0.34	11.4	7	64	2	18	1	9	1	9
6	Bhojpur	35	0.57	4.5	15	43	20	57	0	0	0	0
7	Buxar	20	0.59	6.41	9	45	9	45	2	10	0	0
8	Darbhanga	7	2.05	4.16	0	0	7	100	0	0	0	0
9	Gaya	16	0.3	4.71	8	50	8	50	0	0	0	0
10	Gopalganj	18	0.05	2.29	17	94	1	6	0	0	0	0
11	Jamui	15	0.58	9.67	5	33	6	40	4	27	0	0
12	Jehanabad	18	1.1	3.87	8	44	10	56	0	0	0	0
13	Kaimur	11	0.98	6.27	5	45	4	36	2	18	0	0
14	Katihar	14	1.45	3.47	2	14	12	86	0	0	0	0
15	Khagaria	18	0.6	3.63	12	67	6	33	0	0	0	0
16	Kishanganj	9	1.55	2.96	6	67	3	33	0	0	0	0
17	Lakhisarai	7	0.69	6.95	5	71	1	14	1	14	0	0
18	Madhepura	14	0.69	3.12	5	36	9	64	0	0	0	0
19	Madhubani	20	0.24	5.11	7	35	12	60	1	5	0	0
20	Munger	9	0.45	7.43	5	56	3	33	1	11	0	0
21	Muzaffarpur	11	0.49	2.16	9	82	2	18	0	0	0	0
22	Nalanda	36	0.1	7.3	21	58	13	36	2	6	0	0
23	Nawada	15	0.54	9.32	6	40	6	40	3	20	0	0
24	W Champaran	6	0.36	1.46	6	10	0	0	0	0	0	0
25	Patna	30	0.14	4.35	23	77	7	23	0	0	0	0
26	E Champaran	4	0.32	1.36	4	10	0	0	0	0	0	0
27	Purnia	11	1.56	3.18	3	27	8	73	0	0	0	0
28	Rohtas	18	0.35	10.1	9	50	5	28	3	17	1	6
29	Saharsa	14	0.69	3.87	7	50	7	50	0	0	0	0
30	Samastipur	13	0.95	6.27	3	23	9	69	1	8	0	0
31	Saran	13	0.23	1.73	13	10	0	0	0	0	0	0
32	Seikhpura	7	0.24	2.35	4	57	3	43	0	0	0	0
33	Sheohar	2	1.18	1.88	2	10	0	0	0	0	0	0
34	Sitamarhi	16	1.07	3.87	3	19	13	81	0	0	0	0
35	Siwan	7	0.49	1.49	7	10	0	0	0	0	0	0
36	Supaul	23	0.2	3.69	15	65	8	35	0	0	0	0
37	Vaishali	21	0.22	1.88	21	10	0	0	0	0	0	0
	Total	560	0.05	11.4	306	55	228	41	23	4	3	1

3.1.3 November 2021

Total 615 HNS wells were analysed during post-monsoon period (November 2021). The minimum and the maximum depth to water levels have been recorded to be 0.10 m bgl (Darbhanga district) and 16.00 m bgl (Rohtas district) respectively. In major area of the State (56%) water level rests in range of 2 – 5 m bgl which covers almost entire SBP and major part of NBP of Bihar State. The depth to water level in the range of >10 m bgl occurs in 2 locations, which covers Bhagalpur, Jamui. The water level in the range of 5-10 m bgl has been observed in only 6% of HNS wells, spatially covers as small patches at many locations in SBP. The shallowest category of >2 m bgl has been shown by Sitamarhi, Sheohar, Gopalganj, Darbhanga district and many localised areas mostly in NBP.

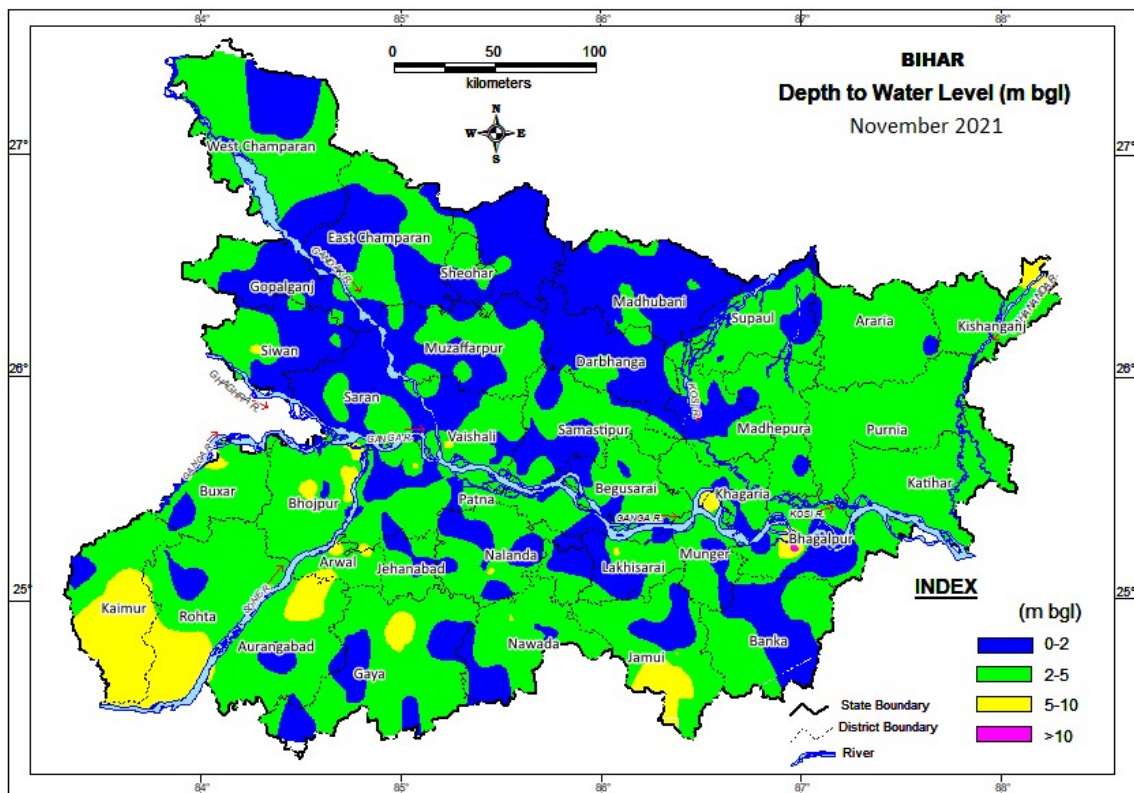


Figure 6: Depth to water level in November 2021

Table 7: District wise well frequency for different ranges of depth to water level of HNS in Nov. 2021 in Bihar state												
SN	District	No. Of Wells analysed	Depth to water level (m bgl)		0-2 m		2-5 m		5-10 m		10-20 m	
			Min.	Max.	No.	%	No.	%	No.	%	No.	%
1	Araria	8	1.93	3.40	1	13	7	88	0	0	0	0
2	Aurangabad	10	0.78	4.93	1	10	9	90	0	0	0	0
3	Banka	14	0.98	4.75	8	57	6	43	0	0	0	0
4	Begusarai	36	0.76	5.20	5	14	28	78	3	8	0	0
5	Bhagalpur	14	0.97	10.69	4	29	8	57	1	7	1	7
6	Bhojpur	26	1.38	7.84	5	19	16	62	5	19	0	0
7	Buxar	16	0.78	5.68	5	31	9	56	2	13	0	0
8	Darbhanga	9	1.20	2.67	7	78	2	22	0	0	0	0
9	Gaya	17	1.08	7.00	7	41	7	41	3	18	0	0
10	Gopalganj	20	1.24	3.30	12	60	8	40	0	0	0	0
11	Jamui	14	0.18	10.56	4	29	7	50	2	14	1	7
12	Jehanabad	19	1.05	5.88	4	21	12	63	3	16	0	0
13	Kaimur	5	0.94	9.30	1	20	2	40	2	40	0	0
14	Katihar	14	2.15	4.15	0	0	14	100	0	0	0	0
15	Khagaria	18	1.00	4.40	4	22	14	78	0	0	0	0
16	Kishanganj	9	2.12	5.85	0	0	8	89	1	11	0	0
17	Lakhisarai	9	1.00	8.27	5	56	2	22	2	22	0	0
18	Madhepura	16	1.12	3.47	3	19	13	81	0	0	0	0
19	Madhubani	23	0.60	3.60	15	65	8	35	0	0	0	0
20	Munger	8	1.31	7.04	3	38	4	50	1	13	0	0
21	Muzaffarpur	24	0.63	3.27	12	50	12	50	0	0	0	0
22	Nalanda	31	0.30	6.27	17	55	13	42	1	3	0	0
23	Nawada	13	1.39	5.22	5	38	7	54	1	8	0	0
24	W champaran	11	1.50	3.65	2	18	9	82	0	0	0	0
25	Patna	32	0.12	5.40	18	56	12	38	2	6	0	0
26	E champaran	27	0.71	5.02	12	44	14	52	1	4	0	0
27	Purnia	18	2.15	4.58	0	0	18	100	0	0	0	0
28	Rohtas	14	0.10	8.96	2	14	10	71	2	14	0	0
29	Saharsa	18	1.06	3.15	9	50	9	50	0	0	0	0
30	Samastipur	20	0.27	4.46	10	50	10	50	0	0	0	0
31	Saran	16	0.14	5.04	11	69	4	25	1	6	0	0
32	Seikhpura	7	0.60	2.81	4	57	3	43	0	0	0	0
33	Sheohar	4	1.45	2.86	1	25	3	75	0	0	0	0
34	Sitamarhi	16	0.75	2.51	14	88	2	13	0	0	0	0
35	Siwan	15	0.78	5.26	9	60	5	33	1	7	0	0
36	Supaul	22	1.14	3.08	6	27	16	73	0	0	0	0
37	Vaishali	22	0.86	5.60	9	41	12	55	1	5	0	0
	Total	615	0.10	10.69	235	38	343	56	35	6	2	0

3.1.4 January 2022

During the recession period (Jan. 2022), total 640 HNS were analysed. The minimum depth to water level of 0.47 m bgl has been observed in Muzaffarpur district, and maximum water level of 15.8 m bgl in the Rohtas district. During Jan. 2022, depth to water level rests within the range of 2–5 m bgl in major part (67% area) of Bihar State. The shallowest water level category of < 2 m bgl has been found in many localised areas, mostly in NBP. A patch, comprising major part of Kaimur, Rohtas and Buxar district and a strip covering part of Jamui, Lakhisarai, Munger, Begusarai, Khagaria and Bhagalpur have shown water level between 5 and 10 m bgl. The water level of more than 10 m bgl has been observed at many locations such as southern part of Kaimur, Banka, Jamui and eastern part of Katihar.

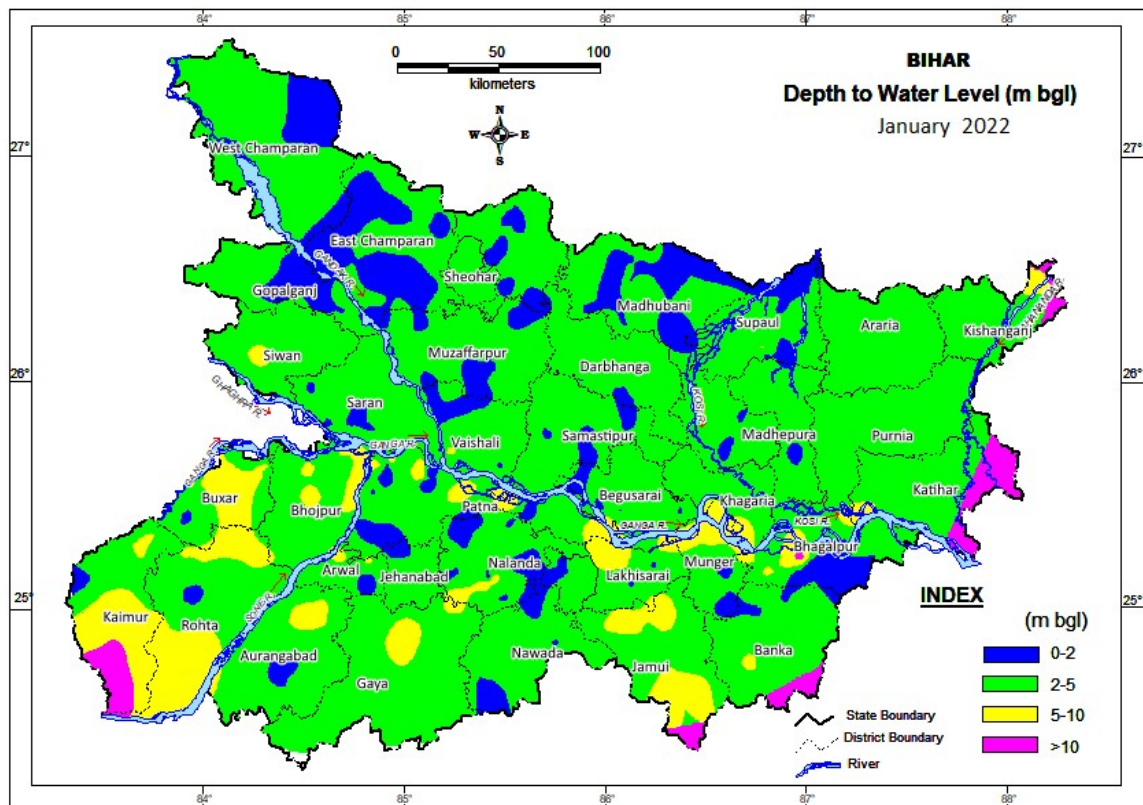


Figure 7: Depth to water level in January 2022

Table 8: District wise well frequency for different ranges of depth to water level of HNS in Jan. 2021 in Bihar state												
SN	District	No. of Wells analysed	Depth to water level (m bgl)		0-2 m		2-5 m		5-10 m		10-20 m	
			Min.	Max.	No.	%	No.	%	No.	%	No.	%
1	Araria	7	2.62	3.85	0	0	7	100	0	0	0	0
2	Aurangabad	11	0.80	4.90	2	18	9	82	0	0	0	0
3	Banka	12	1.79	5.19	2	17	9	75	1	8	0	0
4	Begusarai	35	0.90	5.06	5	14	29	83	1	3	0	0
5	Bhagalpur	14	0.97	10.76	3	21	8	57	2	14	1	7
6	Bhojpur	31	2.17	8.72	0	0	17	55	14	45	0	0
7	Buxar	17	1.78	8.30	1	6	7	41	9	53	0	0
8	Darbhanga	10	1.52	3.01	2	20	8	80	0	0	0	0
9	Gaya	18	2.04	7.10	0	0	14	78	4	22	0	0
10	Gopalganj	19	1.50	3.83	9	47	10	53	0	0	0	0
11	Jamui	11	2.26	9.97	0	0	7	64	4	36	0	0
12	Jehanabad	18	1.15	5.88	2	11	14	78	2	11	0	0
13	Kaimur	8	1.35	10.24	1	13	2	25	4	50	1	13
14	Katihar	14	3.28	5.65	0	0	13	93	1	7	0	0
15	Khagaria	19	3.15	6.90	0	0	18	95	1	5	0	0
16	Kishanganj	8	2.45	6.65	0	0	7	88	1	13	0	0
17	Lakhisarai	9	1.33	8.78	3	33	2	22	4	44	0	0
18	Madhepura	17	1.45	5.02	1	6	15	88	1	6	0	0
19	Madhubani	24	1.05	4.23	10	42	14	58	0	0	0	0
20	Munger	7	1.42	7.85	2	29	3	43	2	29	0	0
21	Muzaffarpur	25	0.01	3.92	7	28	18	72	0	0	0	0
22	Nalanda	36	0.60	6.34	13	36	20	56	3	8	0	0
23	Nawada	16	0.63	6.26	4	25	11	69	1	6	0	0
24	W Champaran	13	0.41	4.18	2	15	11	85	0	0	0	0
25	Patna	26	0.28	6.95	8	31	13	50	5	19	0	0
26	E Champaran	29	0.45	4.81	15	52	14	48	0	0	0	0
27	Purnia	15	2.98	4.92	0	0	15	100	0	0	0	0
28	Rohtas	17	0.80	9.84	1	6	9	53	7	41	0	0
29	Saharsa	17	1.17	4.55	6	35	11	65	0	0	0	0
30	Samastipur	23	0.75	5.47	3	13	19	83	1	4	0	0
31	Saran	26	1.56	5.35	8	31	17	65	1	4	0	0
32	Seikhpura	7	0.77	3.47	4	57	3	43	0	0	0	0
33	Sheohar	4	2.35	3.50	0	0	4	100	0	0	0	0
34	Sitamarhi	15	0.86	2.50	6	40	9	60	0	0	0	0
35	Siwan	13	2.11	5.71	0	0	12	92	1	8	0	0
36	Supaul	24	1.00	5.10	9	38	14	58	1	4	0	0
37	Vaishali	25	1.21	5.44	9	36	15	60	1	4	0	0
	Total	640	0.45	10.76	138	22	428	67	72	11	2	0

3.2 SEASONAL FLUCTUATION

3.2.1 May 2021 to August 2021

A total of 189 wells have been analysed to study the monsoon fluctuation during August 2021. Rise in water level has been recorded in 158 (approx. 84%), whereas the fall is observed only in 28 (approx. 16%) of HNS analysed. The area covered by the analysed wells has been depicted on **fig. 7**. Fluctuation has been further categorised in different ranges. Majority of HNS have shown rise of water level in the range of 2 to 4 m and 0-2 m which constitutes 29% and 43% of the total wells analysed respectively. These ranges of water level rise have been observed in almost entire area covered in monitoring.

The category of > 4 m water level rise has been observed as patches in Aurangabad, Begusarai, Bhojpur, Buxar, Gaya, Nalanda, Patna district.

Total 28 wells located in parts of Darbhanga, Nalanda, Nawada, Patna, Samastipur, Saran, Sitamarhi district have shown fall in water level due to some local reason. (**Table 9**).

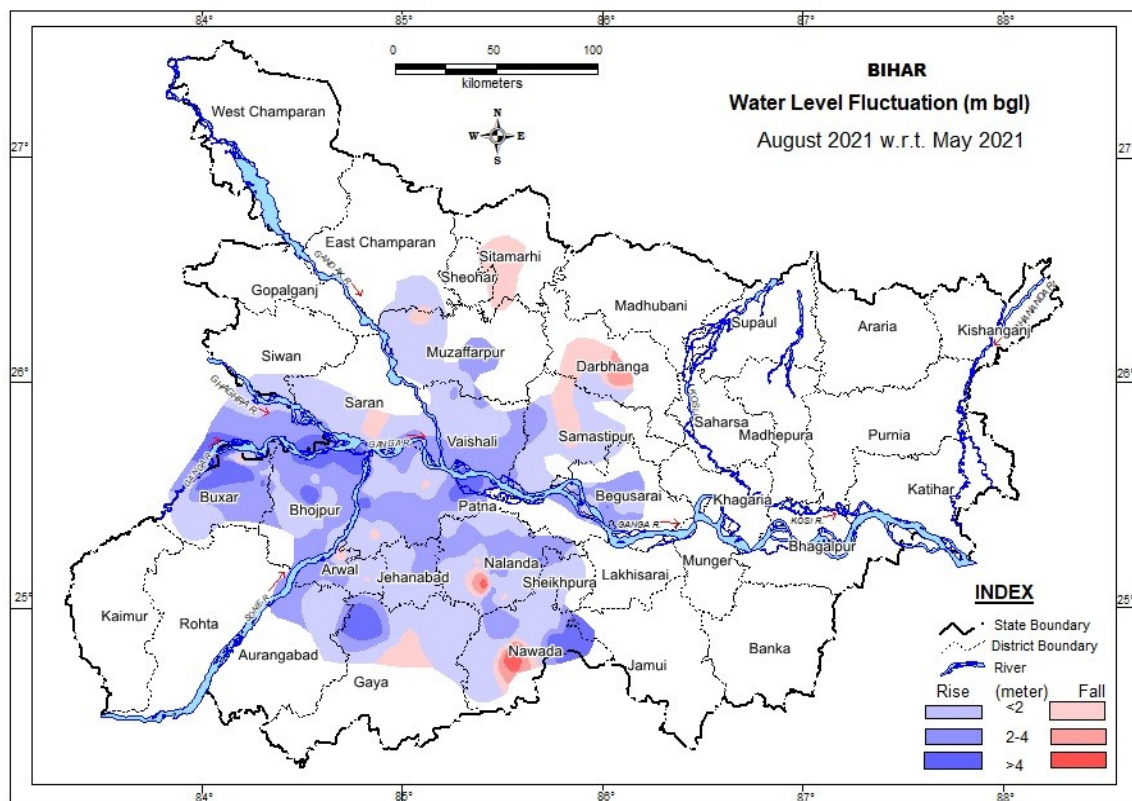


Figure 8: Water level Fluctuation between May 2021 and August 2021

Table 9: District wise categorization of fluctuation and their frequency of water levels of HNS in Aug. 2021 w.r.t. May 2021																				
SN	District	No. of wells analysed	Range of fluctuation (m)				No. of wells showing fluctuation in the range of												Total	
							Rise						Fall							
			Rise		Fall		0 to 2		2 to 4		> 4		0 to 2		2 to 4		> 4			
			Min.	Max.	Min.	Max.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Rise	Fall
1	Aurangabad	5	0.26	4.10	-	-	2	40	1	20	1	20	0	0	0	0	0	0	4	0
2	Begusarai	7	0.79	4.14	-	-	3	43	3	43	1	14	0	0	0	0	0	0	7	0
3	Bhojpur	23	0.68	6.92	-	-	5	22	10	43	8	35	0	0	0	0	0	0	23	0
4	Buxar	18	0.85	7.07	0.88	0.88	6	33	5	28	6	33	1	5.6	0	0	0	0	17	1
5	Darbhanga	4	0.71	1.30	0.72	3.86	2	50	0	0	0	0	1	25	1	25	0	0	2	2
6	Gaya	4	0.50	7.05	0.26	1.25	1	25	0	0	1	25	2	50	0	0	0	0	2	2
7	Jehanabad	9	0.34	2.70	0.03	2.00	5	56	2	22	0	0	2	22	0	0	0	0	7	2
8	Muzaffarpur	7	0.12	2.35	0.13	0.13	5	71	1	14	0	0	1	14	0	0	0	0	6	1
9	Nalanda	32	0.14	4.47	0.10	4.59	14	44	12	38	1	3	4	13	0	0	1	3	27	5
10	Nawada	13	0.55	6.10	5.72	5.72	7	54	3	23	2	15	0	0	0	0	1	8	12	1
11	Patna	25	0.20	4.94	0.02	0.28	11	44	5	20	3	12	4	16	0	0	0	0	19	4
12	E Champaran	1	0.32	0.32	-	-	1	100	0	0	0	0	0	0	0	0	0	0	1	0
13	Samastipur	8	0.25	3.65	0.35	0.45	5	63	1	13	0	0	2	25	0	0	0	0	6	2
14	Saran	5	1.03	2.05	0.27	0.66	2	40	1	20	0	0	2	40	0	0	0	0	3	2
15	Seikhpura	5	0.54	3.76	-	-	3	60	2	40	0	0	0	0	0	0	0	0	5	0
16	Sitamarhi	6	-	-	0.55	1.94	0	0	0	0	0	0	6	100	0	0	0	0	0	6
17	Siwan	1	1.28	1.28	-	-	1	100	0	0	0	0	0	0	0	0	0	0	1	0
18	Vaishali	16	0.34	3.90	-	-	8	50	8	50	0	0	0	0	0	0	0	0	16	0
	Total	189	1.28	0.32	0.02	5.72	81	43	54	29	23	12	25	13	1	1	2	1	158	28

3.2.2 May 2021 to November 2021

Water level of 194 HNS were analysed as to compare with the water level during May 2021. As per the comparison between Nov. 2021 and May 2021, rise of water level observed in 140 (72%) up to 7.35 m (Nawada) whereas, only 54 (28%) HNS have shown fall in water. The majority of HNS (91 well, 47%) have shown rise in the range of 0-2 m, whereas the 37 (19%) and 12 (6%) NHS have shown rise in water level rise 2 to 4 and > 4m m respectively.

The water level fluctuation has been depicted in **Fig. 9**. Almost entire area covered by analysed wells has shown rise in water level. An area covering parts of Bhojpur, Buxar, Gaya, Nalanda, Nawada, Samastipur district has shown rise in water level in the range of > 4 m.

The localised areas covering part of Sitamarhi, Muzaffarpur, Vaishali, Darbhanga, Jehanabad, Nalanda, Nawada and Gaya district have also shown fall in water level. (**Table 10**).

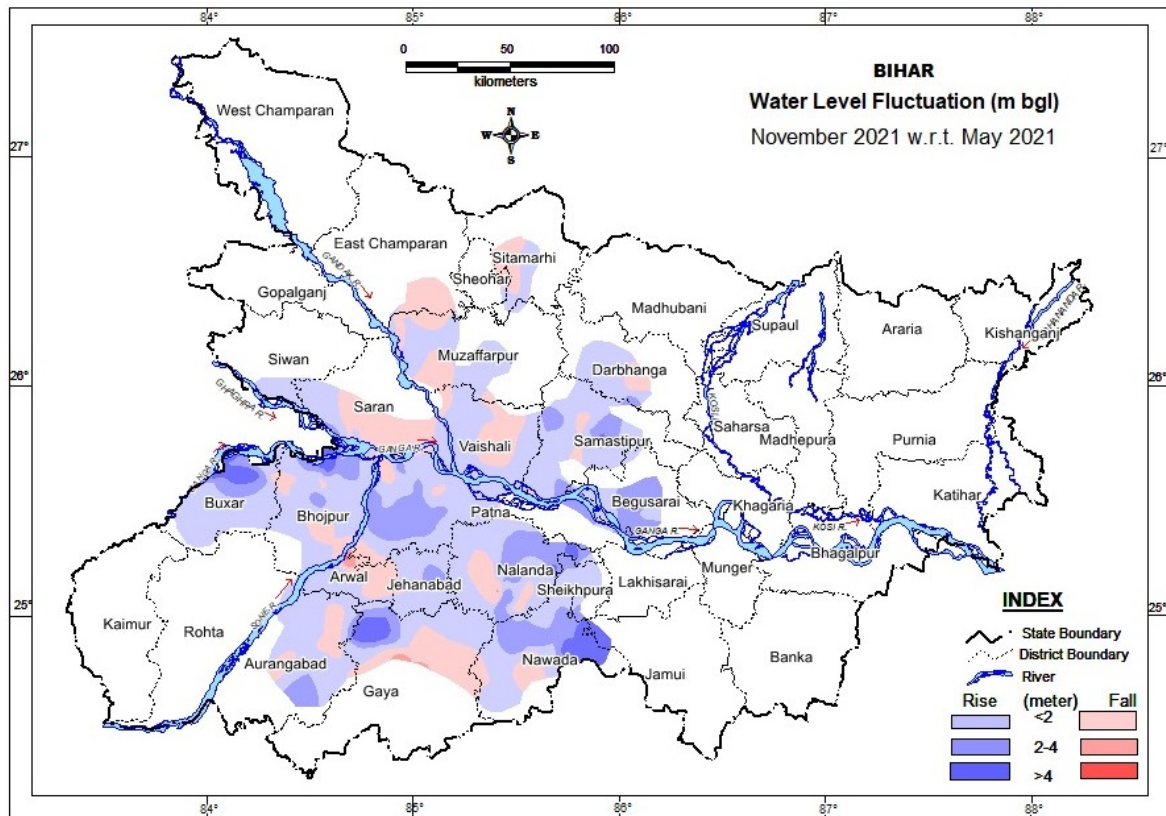


Figure 9: Fluctuation in ground water level between May 2021 and Nov. 2021.

Table 10: District wise categorization of fluctuation and their frequency of water levels of HNS in Nov. 2021 w.r.t. May 2021																				
SN	District	No. of wells analysed	Range of fluctuation (m)				No. of wells showing fluctuation												Total	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		> 4		0 to 2		2 to 4		> 4			
			Min.	Max.	Min.	Max.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Rise	Fall
1	Aurangabad	5	1.00	3.08	0.18	0.27	1	20	1	20	0	0	3	60	0	0	0	0	2	3
2	Begusarai	8	0.44	3.82	-	-	3	38	5	63	0	0	0	0	0	0	0	0	8	0
3	Bhojpur	19	0.07	6.05	0.55	0.74	13	68	3	16	1	5	2	11	0	0	0	0	17	2
4	Buxar	12	0.65	5.84	1.46	1.46	6	50	1	8	4	33	1	8	0	0	0	0	11	1
5	Darbhanga	6	0.01	2.17	1.88	1.88	4	67	1	17	0	0	1	17	0	0	0	0	5	1
6	Gaya	5	4.85	6.43	0.28	3.55	0	0	0	0	2	40	2	40	1	20	0	0	2	3
7	Jehanabad	10	0.04	2.65	0.61	4.17	4	40	1	10	0	0	4	40	0	0	1	10	5	5
8	Muzaffarpur	14	0.02	2.39	0.09	0.85	9	64	1	7	0	0	4	29	0	0	0	0	10	4
9	Nalanda	27	0.18	4.54	0.33	2.04	12	44	6	22	2	7	6	22	1	4	0	0	20	7
10	Nawada	12	0.60	7.35	0.26	0.96	5	42	3	25	2	17	2	17	0	0	0	0	10	2
11	Patna	20	0.34	3.80	0.17	1.46	7	35	9	45	0	0	4	20	0	0	0	0	16	4
12	E Champaran	3	1.26	1.26	0.41	2.07	1	33	0	0	0	0	1	33	1	33	0	0	1	2
13	Samastipur	14	0.77	4.13	0.04	0.53	6	43	4	29	1	7	3	21	0	0	0	0	11	3
14	Saran	8	0.63	1.42	0.35	1.77	3	38	0	0	0	0	5	63	0	0	0	0	3	5
15	Seikhpura	5	0.08	3.12	-	-	3	60	2	40	0	0	0	0	0	0	0	0	5	0
16	Sitamarhi	6	0.27	0.27	0.07	1.05	1	17	0	0	0	0	5	83	0	0	0	0	1	5
17	Siwan	3	0.19	1.45	0.14	0.14	2	67	0	0	0	0	1	33	0	0	0	0	2	1
18	Vaishali	17	0.15	1.97	0.12	1.60	11	65	0	0	0	0	6	35	0	0	0	0	11	6
	Total	194	4.85	0.27	0.00	4.17	91	47	37	19	12	6	50	26	3	2	1	1	140	54

3.2.3 May 2021 to January 2022

Water level data of January 2022 has been compared with the Water level data of May 2021. Total 209 HNS have been analysed to study seasonal fluctuation in the different depth range and depicted in **Fig. 10**. About 59% (123) HNS has shown rise in water level and rest 41% (86) has shown fall.

Majority of HNS (43%) has shown rise in water level in the range of 0 – 2 in major part of the area covered by analysed wells. The localised areas falling in part of Begusarai, Bhojpur, Buxar, Nalanda, Nawada, Samastipur have shown rise in water level between 2 and 4 m. A patch of more than 4 m rise has been observed in Gaya and Nawada district.

Except Begusarai, Majority of districts have shown fall in water level down to 2 m. The fall of water level more than 4 m has been recorded only in 1 HNS located in Jehanabad district (**Table 11**).

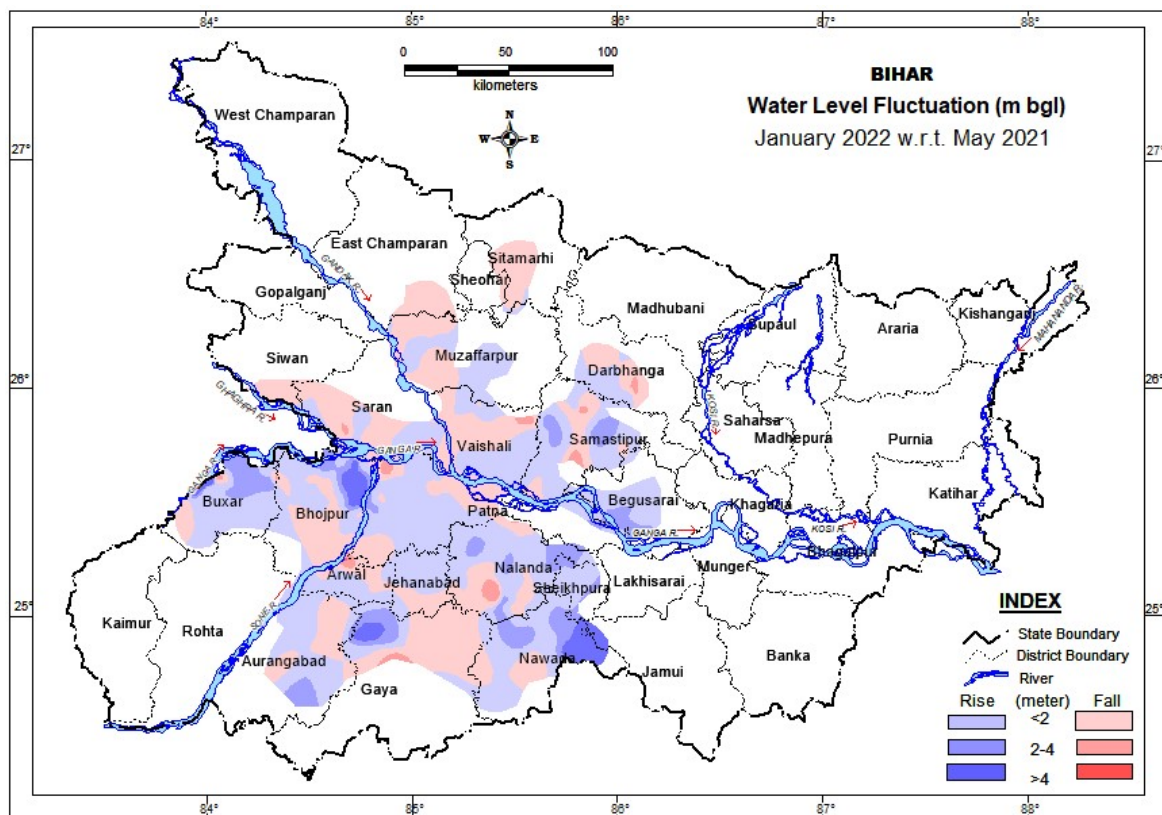


Figure 10: Fluctuation in ground water level between May 2021 and Jan. 2022.

Table 11: District wise categorization of fluctuation and their frequency of water levels of HNS in Jan. 2022 w.r.t. May 2021																				
SN	District	No. of wells analysed	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation in the range of												Total	
							Rise						Fall							
			Rise		Fall		0 to 2		2 to 4		> 4		0 to 2		2 to 4		> 4			
			Min.	Max.	Min.	Max.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Rise	Fall
1	Aurangabad	5	1.00	2.76	0.20	1.17	1	20	1	20	0	0	3	60	0	0	0	0	2	3
2	Begusarai	8	0.41	2.60	-	-	5	63	3	38	0	0	0	0	0	0	0	0	8	0
3	Bhojpur	20	0.20	4.42	0.03	1.41	9	45	2	10	1	5	8	40	0	0	0	0	12	8
4	Buxar	14	0.59	4.37	0.03	2.23	4	29	4	29	1	7	4	29	1	7	0	0	9	5
5	Darbhanga	6	0.61	1.87	0.91	2.34	4	67	0	0	0	0	1	17	1	17	0	0	4	2
6	Gaya	5	4.15	5.31	1.05	3.97	0	0	0	0	2	40	2	40	1	20	0	0	2	3
7	Jehanabad	10	0.17	1.60	0.17	4.17	4	40	0	0	0	0	5	50	0	0	1	10	4	6
8	Muzaffarpur	15	0.26	1.47	0.38	1.24	10	67	0	0	0	0	5	33	0	0	0	0	10	5
9	Nalanda	32	0.14	3.54	0.14	3.83	15	47	6	19	0	0	9	28	2	6	0	0	21	11
10	Nawada	14	0.23	6.93	0.85	1.10	6	43	4	29	2	14	2	14	0	0	0	0	12	2
11	Patna	22	0.01	2.40	0.21	3.28	11	50	1	5	0	0	8	36	2	9	0	0	12	10
12	E Champaran	3	1.04	1.69	0.53	0.53	2	67	0	0	0	0	1	33	0	0	0	0	2	1
13	Samastipur	14	0.83	3.65	0.24	3.01	5	36	3	21	0	0	5	36	1	7	0	0	8	6
14	Saran	10	0.17	1.18	0.02	2.30	3	30	0	0	0	0	6	60	1	10	0	0	3	7
15	Seikhpura	5	1.20	2.58	0.01	0.01	2	40	2	40	0	0	1	20	0	0	0	0	4	1
16	Sitamarhi	6	-	-	0.19	0.74	0	0	0	0	0	0	6	100	0	0	0	0	0	6
17	Siwan	2	-	-	0.65	0.75	0	0	0	0	0	0	2	100	0	0	0	0	0	2
18	Vaishali	18	0.23	2.03	0.02	0.80	9	50	1	6	0	0	8	44	0	0	0	0	10	8
	Total	209	4.15	1.18	0.00	4.17	90	43	27	13	6	3	76	36	9	4	1	0	123	86

3.3.0 ANNUAL FLUCTUATION

3.3.1 May 2020 to May 2021

Fluctuation of ground water level between May 2020 and May 2021 of only 122 HNS could be analysed due to Covid-19 pandemic. These HNS represents limited area of the State as shown in **Fig. 11**. The analysis indicates rise in water level in 104 wells (85%) of the HNS covering major part of the area monitored. Out of which rise of 0 – 2 m has been recorded in 51% (62) of the HNS monitored. About 7% of the well monitored has shown rise in water level more than 4 m.

Fall in water level has been observed only in 15 % of the well analysed which covered the localised areas in parts of Bhojpur, Gaya, Nalanda, Nawada, Patna, Samastipur. Fall of water level from 2 to 4 m in only one HNS location. Fall of water level more than 4 m has not been observed in wells analysed.

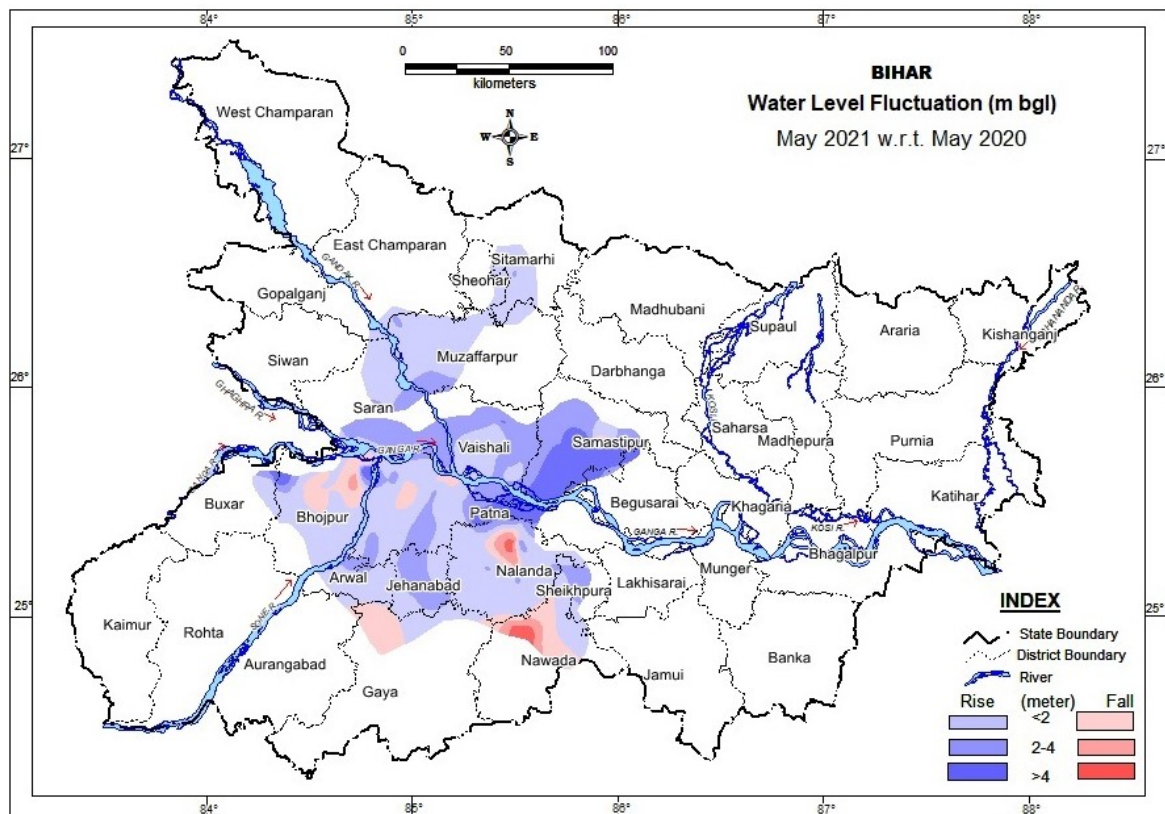


Figure 11: Fluctuation in ground water level between May 2020 and May 2021.

Table 12: District-wise categorization of frequency and fluctuation water levels of HNS of May. 2021 w.r.t. May. 2020 for Bihar State																						
SN	District	No. of HNS	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation in the range of														Total	
			Rise		Fall		Rise						Fall									
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%				
1	Begusarai	2	0.22	1.74	-	-	2	100	0	0	0	0	0	0	0	0	0	0	2	0		
2	Bhojpur	17	0.20	1.43	0.03	1.95	9	53	0	0	0	0	8	47	0	0	0	0	9	8		
3	Buxar	2	0.83	5.53	-	-	1	50	0	0	1	50	0	0	0	0	0	0	2	0		
4	Gaya	3	0.54	1.95	1.82	1.82	2	67	0	0	0	0	1	33	0	0	0	0	2	1		
5	Jehanabad	9	0.42	3.87	-	-	5	56	4	44	0	0	0	0	0	0	0	0	9	0		
6	Muzaffarpur	5	0.19	3.11	-	-	4	80	1	20	0	0	0	0	0	0	0	0	5	0		
7	Nalanda	19	0.11	4.27	2.70	2.70	13	68	4	21	1	5	0	0	1	5	0	0	18	1		
8	Nawada	4	0.62	0.62	0.12	0.66	1	25	0	0	0	0	3	75	0	0	0	0	1	3		
9	Patna	20	0.74	5.89	0.14	0.84	10	50	4	20	2	10	4	20	0	0	0	0	16	4		
10	E champaran	2	0.53	1.47	-	-	2	100	0	0	0	0	0	0	0	0	0	0	2	0		
11	Samastipur	10	2.30	7.07	1.20	1.20	0	0	6	60	3	30	1	10	0	0	0	0	9	1		
12	Saran	7	0.78	3.85	-	-	2	29	5	71	0	0	0	0	0	0	0	0	7	0		
13	Seikhpura	5	0.03	3.72	-	-	2	40	3	60	0	0	0	0	0	0	0	0	5	0		
14	Sitamarhi	4	0.15	2.10	-	-	3	75	1	25	0	0	0	0	0	0	0	0	4	0		
15	Vaishali	13	1.00	4.05	-	-	6	46	6	46	1	8	0	0	0	0	0	0	13	0		
	Total	122	2.30	0.62			62	51	34	28	8	7	17	14	1	1	0	0	104	18		

3.3.2 August 2020 to August 2021

Water level fluctuation between August 2020 and August 2021 has been done for 254 HNS locations. The covered area for annual fluctuation has been shown in **Fig. 12**. The comparison indicates the rise of water level in 72% of the HNS analysed which covered major part of the area. About 4% wells have shown rise > 4 m which located in Aurangabad, Begusarai, Nalanda, Nawada, Seikhpura district.

Total 71 wells have shown fall in water level. Out of which fall less than 2 m has been found in 61 wells. No water level fall is reported from Begusarai, Gopalganj, Purbi Champaran and Vaishali district.

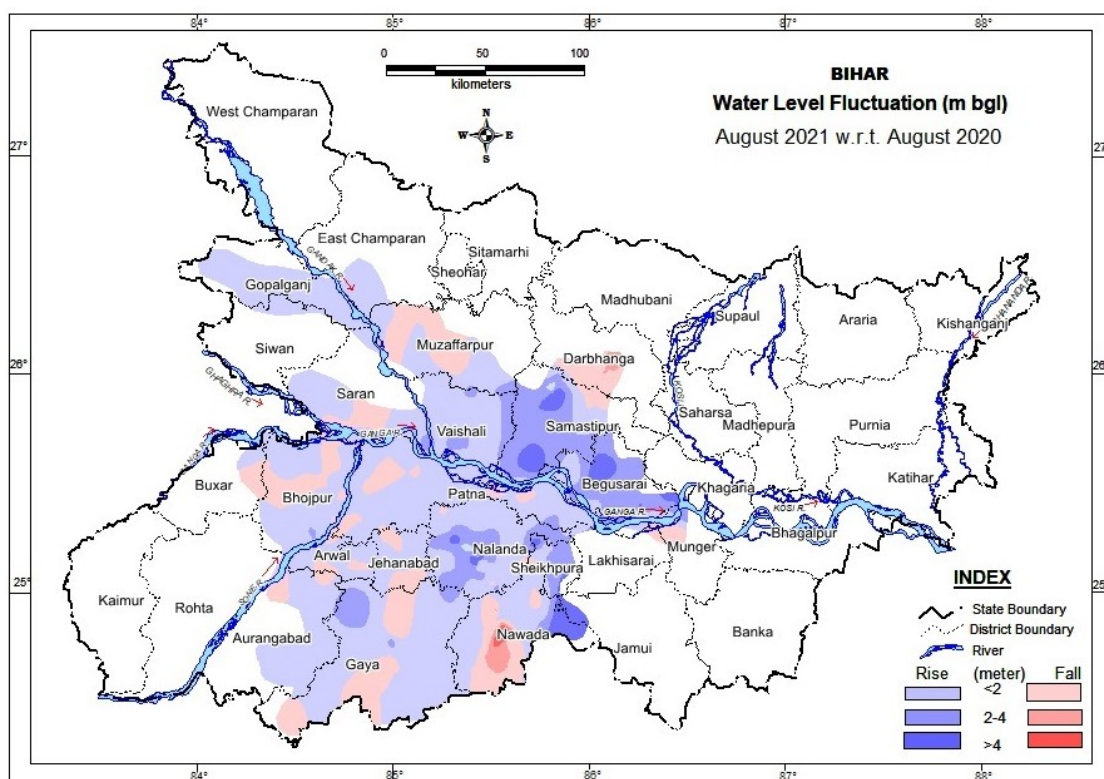


Figure 12: Fluctuation in ground water level between Aug. 2020 and Aug. 2021

Table 13: District-wise categorization of frequency and fluctuation water levels of HNS of Aug. 2021 w.r.t. Aug. 2020 for Bihar State

SN	District	No. of HNS	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation in the range of														Total	
			Rise		Fall		Rise						Fall									
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%	Rise	Fall		
1	Aurangabad	8	0.16	6.73	0.07	0.07	6	75	0	0	1	13	1	1	0	0	0	0	7	1		
2	Begusarai	19	1.43	5.78	-	-	1	5	14	74	4	21	0	0	0	0	0	0	19	0		
3	Bhojpur	31	0.09	2.24	0.05	1.56	22	71	1	3	0	0	8	2	0	0	0	0	23	8		
4	Buxar	4	1.47	1.47	0.08	0.32	1	25	0	0	0	0	3	7	0	0	0	0	1	3		
5	Darbhanga	6	-	-	0.78	2.10	0	0	0	0	0	0	4	6	2	33	0	0	0	6		
6	Gaya	15	0.21	3.55	0.03	1.10	7	47	3	20	0	0	5	3	0	0	0	0	10	5		
7	Gopalganj	8	0.02	0.96	-	-	8	##	0	0	0	0	0	0	0	0	0	0	8	0		
8	Jehanabad	16	0.03	2.02	0.06	0.43	7	44	1	6	0	0	8	5	0	0	0	0	8	8		
9	Muzaffarpur	11	0.03	2.23	0.83	1.83	6	55	1	9	0	0	4	3	0	0	0	0	7	4		
10	Nalanda	36	0.20	6.70	0.05	0.34	15	42	14	39	4	11	3	8	0	0	0	0	33	3		
11	Nawada	11	0.30	6.10	0.02	7.13	6	55	1	9	1	9	2	1	0	0	1	9	8	3		
12	Patna	28	0.04	1.23	0.04	0.46	20	71	0	0	0	0	8	2	0	0	0	0	20	8		
13	E Champaran	2	0.23	0.58	-	-	2	100	0	0	0	0	0	0	0	0	0	0	2	0		
14	Samastipur	8	0.90	3.50	0.07	0.07	3	38	4	50	0	0	1	1	0	0	0	0	7	1		
15	Saran	7	0.04	1.14	0.71	0.75	5	71	0	0	0	0	2	2	0	0	0	0	5	2		
16	Seikhpura	7	1.23	6.18	0.30	0.30	1	14	3	43	1	14	1	1	0	0	0	0	5	1		
17	Sheohar	2	-	-	0.73	1.33	0	0	0	0	0	0	2	#	0	0	0	0	0	2		
18	Sitamarhi	16	-	-	0.10	3.60	0	0	0	0	0	0	9	5	7	44	0	0	0	16		
19	Vaishali	19	0.02	3.29	-	-	16	84	3	16	0	0	0	0	0	0	0	0	19	0		
	Total	254	1.47	0.58			126	50	45	18	11	4	61	2	9	4	1	0	182	71		

3.3.3 November 2020 to November 2021

Water level fluctuation between November 2020 and November 2021 has been analysed for 549 HNS after carrying out monitoring in entire State. The analysis indicates that there is a fall of water level in about 26% of the HNS. About 25% NHS has shown water level fall less than 2 m. Water level rise of upto 2 m is shown by majority of NBP, central and western part of SBP. Only 5% NHS locations has shown rise more than 2 m which are scattered in Central part of NBP and southern part of SBP. About 25% NHS has also shown fall in water level less than 2 m, mostly located in northern part of NBP and eastern part of SBP.

(Fig.13, Table 14).

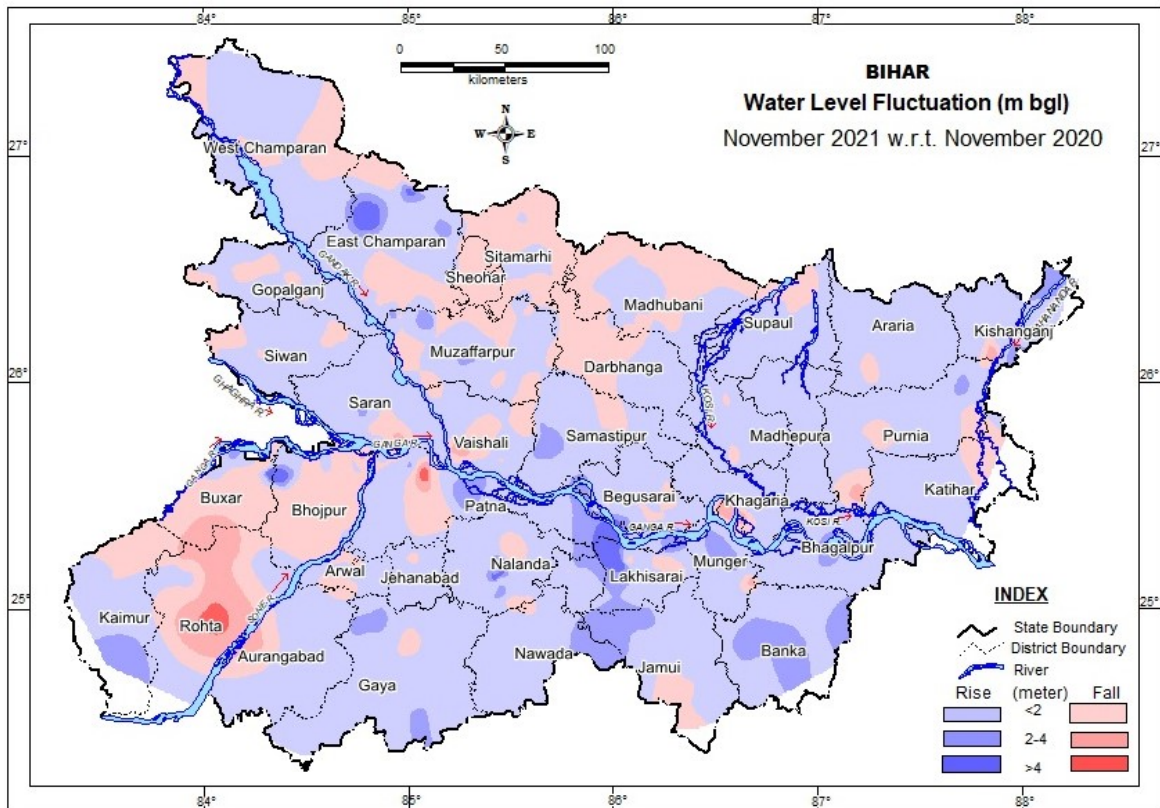


Figure 13: *Fluctuation in ground water level between Nov 2020 and Nov. 2021.*

Table 14: District-wise categorization of frequency and fluctuation water levels of HNS of Nov. 2021 w.r.t. Nov. 2020 for Bihar State																				
SN	District	No. of HNS	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation in the range of													
			Rise		Fall		Rise							Fall						
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%	Rise	Fall
1	Araria	8	0.67	1.60	0.41	0.41	7	88	0	0	0	0	1	13	0	0	0	0	7	1
2	Aurangabad	9	0.15	7.80	1.93	1.93	7	78	0	0	1	11	1	11	0	0	0	0	8	1
3	Banka	11	0.86	3.69	-	-	9	82	2	18	0	0	0	0	0	0	0	0	11	0
4	Begusarai	36	0.07	2.22	0.32	1.20	29	81	1	3	0	0	6	17	0	0	0	0	30	6
5	Bhagalpur	9	0.14	11.23	-	-	7	78	1	11	1	11	0	0	0	0	0	0	9	0
6	Bhojpur	24	0.05	0.92	0.07	2.16	3	13	0	0	0	0	18	75	2	8	0	0	3	20
7	Buxar	13	0.09	7.77	0.06	1.24	4	31	0	0	2	15	7	54	0	0	0	0	6	7
8	Darbhanga	9	0.16	0.60	0.04	0.48	3	33	0	0	0	0	6	67	0	0	0	0	3	6
9	Gaya	17	0.10	2.40	0.04	0.35	11	65	3	18	0	0	3	18	0	0	0	0	14	3
10	Gopalganj	19	0.02	13.35	0.06	0.45	13	68	0	0	1	5	5	26	0	0	0	0	14	5
11	Jamui	11	0.17	7.43	0.07	0.07	8	73	1	9	1	9	1	9	0	0	0	0	10	1
12	Jehanabad	16	0.07	1.76	0.30	1.86	13	81	0	0	0	0	3	19	0	0	0	0	13	3
13	Kaimur	5	0.04	3.00	0.21	0.21	3	60	1	20	0	0	1	20	0	0	0	0	4	1
14	Katihar	10	0.27	1.77	0.24	0.24	9	90	0	0	0	0	1	10	0	0	0	0	9	1
15	Khagaria	18	0.17	1.91	2.02	2.02	17	94	0	0	0	0	0	0	1	6	0	0	17	1
16	Kishanganj	8	0.52	3.77	0.13	0.13	5	63	2	25	0	0	1	13	0	0	0	0	7	1
17	Lakhisarai	9	0.74	5.22	0.30	2.09	5	56	1	11	1	11	1	11	1	11	0	0	7	2
18	Madhepura	16	0.04	1.18	-	-	16	100	0	0	0	0	0	0	0	0	0	0	16	0
19	Madhubani	22	0.05	1.15	0.05	0.90	12	55	0	0	0	0	8	36	0	0	0	0	12	8
20	Munger	8	0.05	3.05	3.34	3.34	5	63	2	25	0	0	0	0	1	13	0	0	7	1
21	Muzaffarpur	23	0.09	5.13	0.02	0.45	9	39	2	9	1	4	10	43	0	0	0	0	12	10
22	Nalanda	31	0.10	5.65	0.56	0.92	24	77	3	10	2	6	2	6	0	0	0	0	29	2
23	Nawada	12	0.18	2.90	0.01	0.29	9	75	1	8	0	0	2	17	0	0	0	0	10	2
24	W Champaran	11	0.02	1.28	0.02	0.32	6	55	0	0	0	0	5	45	0	0	0	0	6	5
25	Patna	10	0.15	7.12	0.01	1.15	3	30	2	20	3	30	2	20	0	0	0	0	8	2
26	E Champaran	25	0.02	4.60	0.33	1.76	15	60	1	4	1	4	8	32	0	0	0	0	17	8
27	Purnia	14	0.47	2.20	0.01	0.54	9	64	1	7	0	0	4	29	0	0	0	0	10	4
28	Rohtas	9	0.25	16.10	0.09	3.47	3	33	0	0	1	11	3	33	2	22	0	0	4	5
29	Saharsa	18	0.10	0.81	0.28	0.33	16	89	0	0	0	0	2	11	0	0	0	0	16	2
30	Samastipur	16	0.04	2.91	0.50	0.50	12	75	2	13	0	0	1	6	0	0	0	0	14	1
31	Saran	16	0.27	2.26	0.86	2.38	12	75	1	6	0	0	2	13	1	6	0	0	13	3
32	Seikhpura	7	0.58	2.37	0.06	0.06	5	71	1	14	0	0	1	14	0	0	0	0	6	1
33	Sheohar	4	-	-	0.08	1.36	0	0	0	0	0	0	4	##	0	0	0	0	0	4
34	Sitamarhi	16	0.01	0.60	0.10	0.78	5	31	0	0	0	0	11	69	0	0	0	0	5	11
35	Siwan	15	0.14	1.20	0.01	1.03	10	67	0	0	0	0	4	27	0	0	0	0	10	4
36	Supaul	22	0.05	1.80	0.07	0.83	18	82	0	0	0	0	3	14	0	0	0	0	18	3
37	Vaishali	22	0.12	1.78	0.21	3.80	13	59	0	0	0	0	8	36	1	5	0	0	13	9
	Total	549	0.86	0.60	0.00	3.80	355	65	28	5	15	3	135	25	9	2	0	0	398	144

3.3.4 January 2021 to January 2022

Water level fluctuation between January 2021 and January 2022 has been analysed for 588 HNS. The rise in water level within the range from 0.01 to 15.20 m as shown by 426 (72%) wells whereas the fall of water level between 0.01 to 5.57 m observed in 161 (about 28%) wells. About 26% of NHS locations has shown fall in water level less than 2 m. The localised areas of Bhojpur, Buxar, Khagaria, Rohtas, Saharsa, Supaul districts, represented by 1% of NHS monitored, has shown fall in water level between 2 and 4 m. Only 2 NHS, one each in Jamui, Khagaria district has shown fall in water level >4 m.

About 37% area of the State has shown rise of water level upto 2 m which covered central part of NBP and major part of Rohtas, Nawada, Patna, Nalanda, Jehanabad and Jamui in SBP. Water level rise of 2 to 4 m has been observed in total 59 wells mostly located in Aurangabad, Banka, Begusarai, Bhagalpur, Bhojpur, Gaya, Kaimur, Khagaria, Madhepura, Nalanda, Supaul district. A total of 26 HNS has shown rise in water level > 4m, mainly in Begusarai, Nalanda and Rohtas.

(Fig. 14, Table 15).

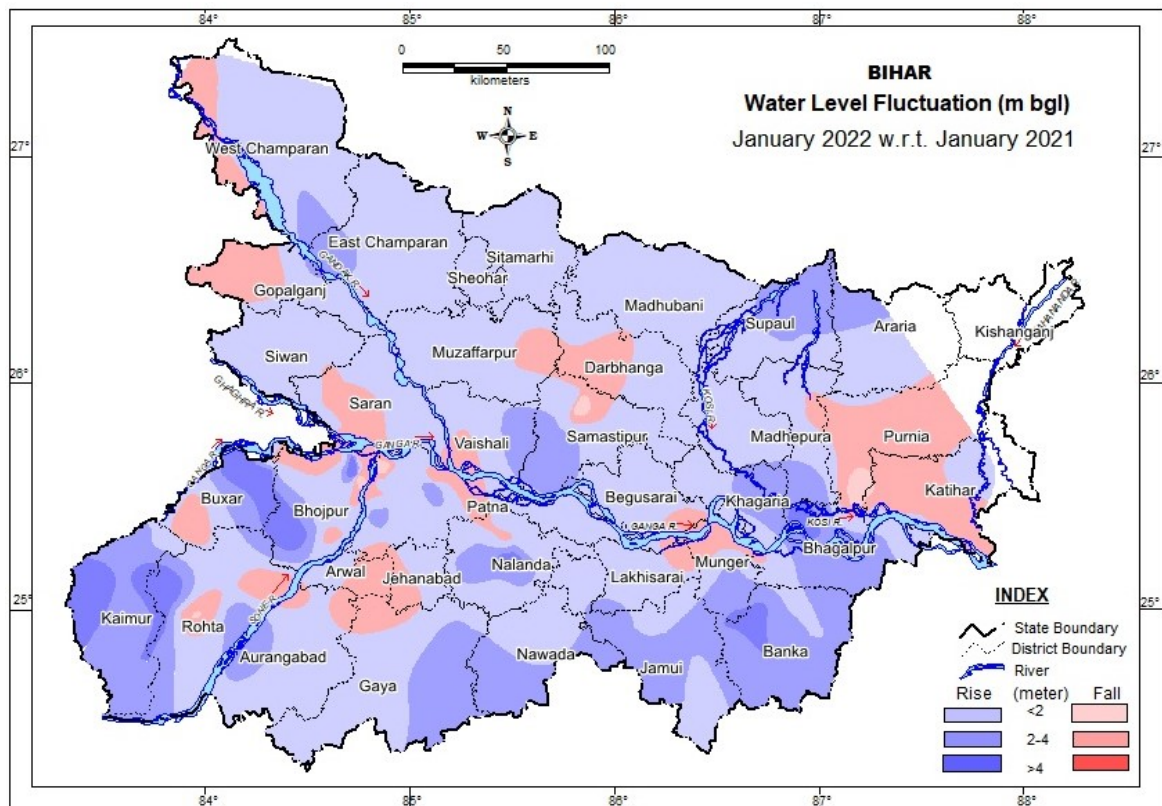


Figure 14: Fluctuation in ground water level between Jan. 2021 and Jan. 2022.

Table 15: District-wise categorization of fluctuation and their frequency of water levels of HNS of Jan 2022 w.r.t. Jan 2021 for Bihar State

SN	District	No. of HNS analysed	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation in the range of														Total	
			Rise		Fall		Rise						Fall									
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%	Rise	Fall		
1	Araria	7	0.05	0.44	0.07	0.70	4	57	0	0	0	0	3	43	0	0	0	0	4	3		
2	Aurangabad	8	0.04	6.38	0.22	0.22	5	63	1	13	1	13	1	13	0	0	0	0	7	1		
3	Banka	12	0.51	4.79	-	-	9	75	1	8	2	17	0	0	0	0	0	0	12	0		
4	Begusarai	34	0.53	5.18	0.59	0.59	16	47	12	35	5	15	1	3	0	0	0	0	33	1		
5	Bhagalpur	13	0.20	9.50	0.16	0.16	6	46	4	31	2	15	1	8	0	0	0	0	12	1		
6	Bhojpur	30	0.01	2.92	0.02	2.58	13	43	1	3	0	0	15	50	1	3	0	0	14	16		
7	Buxar	15	0.16	10.09	0.10	2.02	2	13	0	0	3	20	9	60	1	7	0	0	5	10		
8	Darbhanga	10	0.04	0.44	0.05	0.82	6	60	0	0	0	0	4	40	0	0	0	0	6	4		
9	Gaya	10	0.16	2.56	-	-	9	90	1	10	0	0	0	0	0	0	0	0	10	0		
10	Gopalganj	19	0.03	1.37	0.06	0.83	14	74	0	0	0	0	5	26	0	0	0	0	14	5		
11	Jamui	11	0.69	3.31	0.02	4.19	6	55	1	9	0	0	3	27	0	0	1	9	7	4		
12	Jehanabad	18	0.24	1.32	0.03	1.18	10	56	0	0	0	0	8	44	0	0	0	0	10	8		
13	Kaimur	8	0.68	5.48	1.36	1.36	2	25	3	38	2	25	1	13	0	0	0	0	7	1		
14	Katihar	13	0.23	0.52	0.10	0.55	3	23	0	0	0	0	10	77	0	0	0	0	3	10		
15	Khagaria	18	0.12	3.92	2.55	5.57	6	33	10	56	0	0	0	0	1	6	1	6	16	2		
16	Kishanganj	7	3.33	3.33	0.14	0.59	0	0	1	14	0	0	6	86	0	0	0	0	1	6		
17	Lakhisarai	9	0.32	1.90	-	-	9	100	0	0	0	0	0	0	0	0	0	0	9	0		
18	Madhepura	16	0.07	3.60	0.26	1.26	9	56	2	13	0	0	5	31	0	0	0	0	11	5		
19	Madhubani	24	0.01	1.44	0.08	0.75	18	75	0	0	0	0	6	25	0	0	0	0	18	6		
20	Munger	7	0.66	2.08	0.55	1.59	4	57	1	14	0	0	2	29	0	0	0	0	5	2		
21	Muzaffarpur	24	0.20	1.97	0.02	1.36	17	71	0	0	0	0	7	29	0	0	0	0	17	7		
22	Nalanda	34	0.01	8.10	0.06	0.87	21	62	5	15	4	12	4	12	0	0	0	0	30	4		
23	Nawada	13	0.16	4.19	0.33	0.33	9	69	2	15	1	8	1	8	0	0	0	0	12	1		
24	W champaran	11	0.32	1.80	0.09	0.45	7	64	0	0	0	0	4	36	0	0	0	0	7	4		
25	Patna	17	0.06	2.68	0.15	1.74	10	59	1	6	0	0	6	35	0	0	0	0	11	6		
26	E champaran	24	0.14	6.28	1.89	1.89	18	75	4	17	1	4	1	4	0	0	0	0	23	1		
27	Purnia	13	0.20	0.20	0.22	0.97	1	8	0	0	0	0	12	92	0	0	0	0	1	12		
28	Rohtas	16	0.25	15.20	0.24	2.16	6	38	2	13	5	31	2	13	1	6	0	0	13	3		
29	Saharsa	17	0.64	1.95	0.16	2.65	9	53	0	0	0	0	6	35	2	12	0	0	9	8		
30	Samastipur	20	0.16	3.82	0.11	0.96	13	65	2	10	0	0	4	20	0	0	0	0	15	4		
31	Saran	26	0.11	2.22	0.02	1.06	16	62	1	4	0	0	9	35	0	0	0	0	17	9		
32	Seikhpura	6	0.39	2.65	-	-	5	83	1	17	0	0	0	0	0	0	0	0	6	0		
33	Sheohar	4	0.41	0.41	0.61	1.06	1	25	0	0	0	0	3	75	0	0	0	0	1	3		
34	Sitamarhi	15	0.09	0.45	0.22	0.50	13	87	0	0	0	0	2	13	0	0	0	0	13	2		
35	Siwan	13	0.04	1.34	0.01	0.63	10	77	0	0	0	0	3	23	0	0	0	0	10	3		
36	Supaul	23	0.05	2.77	0.27	2.40	14	61	3	13	0	0	5	22	1	4	0	0	17	6		
37	Vaishali	23	0.08	1.82	0.19	0.65	20	87	0	0	0	0	3	13	0	0	0	0	20	3		
	Total	588	3.33	0.20	0.00	5.57	341	58	59	10	26	4	152	26	7	1	2	0	426	161		

3.4 DECADAL FLUCTUATION

3.4.1 Decadal Mean of May to May 2021

Fluctuation in water level of May 2021 with respect to decadal mean of May has been analysed for 223 HNS, which indicates rise in 89% and fall in remaining 11% HNS. The rise of water level in the range of 0 – 2 m is observed in 28% of the HNS monitored. The range of water level rise between 2 and 4 m has been observed in many localised areas including bordering area of East Champaran and Muzaffarnagar, Vaishali, Aurangabad, Gaya. Total 37 HNS have shown rise of water level > 4m with majority of the areas in Patna, Samastipur, Saran, Vaishali districts.

Majority of the well showing fall, are within the range of 2m observed in many localised areas. In Buxar district 7 HNS have shown fall within this category out of 20 well monitored. Only 2 HNS locations, one located in Buxar district and another one located in Nawada has been categorised within the range of 2 to 4 m. No well has shown fall > 4 m. (Table – 16)

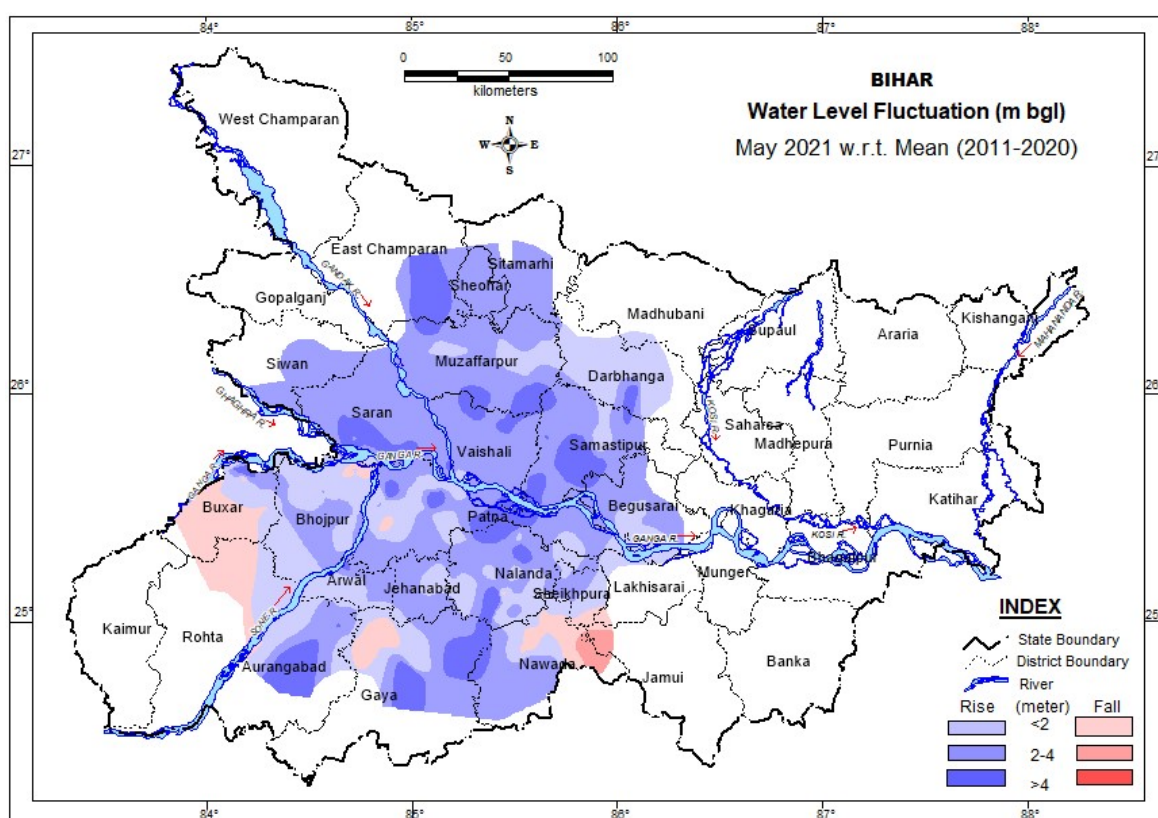


Figure 15: Fluctuation in water level between May (mean) and May 2021.

Table 16: District-wise categorization of fluctuation and their frequency of water levels of HNS of **May, 2021 w.r.t. May mean (2011-2020)** for Bihar State

SN	District	No. of HNS	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation In the range of														Total	
			Rise		Fall		Rise						Fall									
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%	Rise	Fall		
1	Aurangabad	5	0.65	5.75	0.06	0.06	1	20	1	20	2	40	1	20	0	0	0	0	4	1		
2	Begusarai	8	0.62	3.44	-	-	3	38	5	63	0	0	0	0	0	0	0	0	8	0		
3	Bhojpur	23	0.02	3.60	0.26	1.86	10	43	8	35	0	0	5	22	0	0	0	0	18	5		
4	Buxar	20	0.57	7.57	0.01	2.31	4	20	5	25	3	15	7	35	1	5	0	0	12	8		
5	Darbhanga	6	0.36	5.81	-	-	5	83	0	0	1	17	0	0	0	0	0	0	6	0		
6	Gaya	6	0.86	5.70	0.77	1.41	1	17	1	17	2	33	2	33	0	0	0	0	4	2		
7	Jehanabad	10	0.64	4.67	-	-	2	20	7	70	1	10	0	0	0	0	0	0	10	0		
8	Muzaffarpur	15	1.07	4.80	-	-	5	33	7	47	3	20	0	0	0	0	0	0	15	0		
9	Nalanda	32	0.01	5.99	0.33	0.33	14	44	14	44	3	9	1	3	0	0	0	0	31	1		
10	Nawada	14	0.93	3.82	0.20	3.10	3	21	5	36	0	0	5	36	1	7	0	0	8	6		
11	Patna	26	0.39	7.60	0.41	0.41	10	38	9	35	6	23	1	4	0	0	0	0	25	1		
12	E Champaran	3	1.71	4.21	-	-	1	33	1	33	1	33	0	0	0	0	0	0	3	0		
13	Samastipur	14	0.22	5.94	-	-	1	7	7	50	6	43	0	0	0	0	0	0	14	0		
14	Saran	11	2.45	5.38	-	-	0	0	6	55	5	45	0	0	0	0	0	0	11	0		
15	Seikhpura	5	0.52	2.80	-	-	1	20	4	80	0	0	0	0	0	0	0	0	5	0		
16	Sitamarhi	6	1.72	3.49	-	-	1	17	5	83	0	0	0	0	0	0	0	0	6	0		
17	Siwan	3	2.34	3.35	-	-	0	0	3	100	0	0	0	0	0	0	0	0	3	0		
18	Vaishali	16	2.13	5.30	-	-	0	0	12	75	4	25	0	0	0	0	0	0	16	0		
	Total	223	2.80	2.45		3.10	62	28	100	45	37	17	22	10	2	1	0	0	199	24		

3.4.2 Decadal Mean of August to August 2021

Fluctuation in water level of August 2021 with respect to decadal mean of August has been analysed for 556 HNS, covering the entire state of Bihar State. **(Fig 16).** About 79% of the HNS analysed, are categorised under rise in water level and remaining under fall. The rise to the tune of up to 2 m has covered major part of the area (53%) monitored. The rise between 2 and 4 m has been observed in 23% of the HNS analysed. Only 3 HNS have shown rise in water level > 4 m.

The fall up to 2 m has been observed in many localised areas in NBP and SBP including major part of Sitamarhi, Madhubani, Araria, Supaul, Buxar, Bhojpur district. Total 5 HNS have shown fall in the range of 2 to 4 m out of which 3 are located in Sitamarhi district and 1 each in Aurangabad and Munger district. Only 2 HNS have shown fall of water level > 4 located in Aurangabad and Nawada district. **(Table 17).**

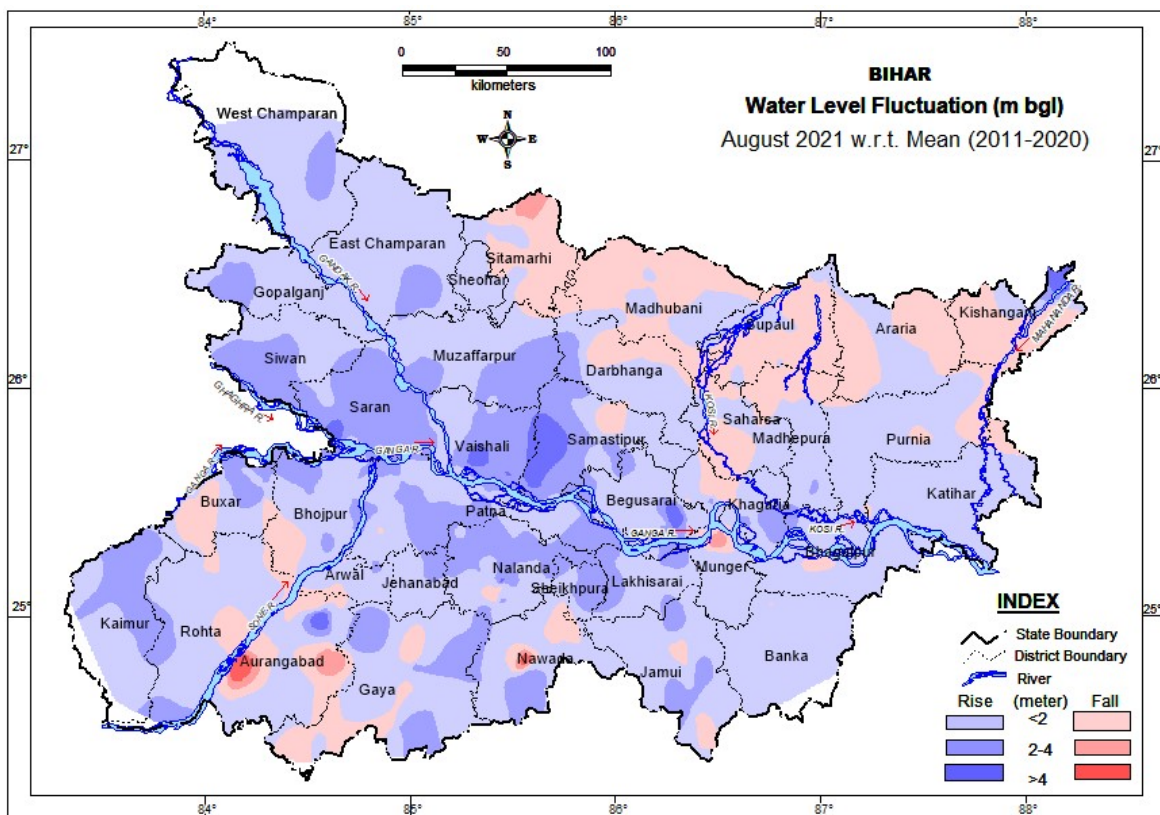


Figure 16: Fluctuation in water level between Aug. (mean) and Aug. 2021

SN	District	No. of HNS	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation In the range of														Total	
			Rise		Fall		Rise						Fall									
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%				
1	Araria	8	0.08	0.38	0.06	0.91	3	38	0	0	0	0	5	63	0	0	0	0	3	5		
2	Aurangabad	17	0.15	5.99	0.05	6.36	8	47	0	0	1	6	6	35	1	6	1	6	9	8		
3	Banka	13	0.25	2.00	0.03	0.03	12	92	0	0	0	0	1	8	0	0	0	0	12	1		
4	Begusarai	33	0.08	5.92	-	-	21	64	9	27	3	9	0	0	0	0	0	0	33	0		
5	Bhagalpur	11	0.36	1.86	0.57	0.57	10	91	0	0	0	0	1	9	0	0	0	0	10	1		
6	Bhojpur	35	0.46	2.99	0.84	0.84	25	71	9	26	0	0	1	3	0	0	0	0	34	1		
7	Buxar	21	0.69	4.17	0.49	0.92	8	38	9	43	1	5	3	14	0	0	0	0	18	3		
8	Darbhanga	7	0.19	1.19	0.00	0.65	5	71	0	0	0	0	2	29	0	0	0	0	5	2		
9	Gaya	16	0.09	3.99	0.12	0.58	6	38	5	31	0	0	5	31	0	0	0	0	11	5		
10	Gopalganj	17	0.45	3.38	0.12	0.12	13	76	3	18	0	0	1	6	0	0	0	0	16	1		
11	Jamui	15	0.21	3.41	0.19	0.68	8	53	5	33	0	0	2	13	0	0	0	0	13	2		
12	Jehanabad	18	0.64	2.36	0.02	0.69	11	61	3	17	0	0	4	22	0	0	0	0	14	4		
13	Kaimur	11	0.89	3.55	-	-	4	36	7	64	0	0	0	0	0	0	0	0	11	0		
14	Katihar	14	0.01	1.80	0.08	1.10	12	86	0	0	0	0	2	14	0	0	0	0	12	2		
15	Khagaria	18	0.47	3.60	0.08	0.68	9	50	5	28	0	0	4	22	0	0	0	0	14	4		
16	Kishanganj	9	4.20	4.20	0.02	1.18	0	0	0	0	1	11	8	89	0	0	0	0	1	8		
17	Lakhisarai	7	0.32	2.48	0.23	0.23	5	71	1	14	0	0	1	14	0	0	0	0	6	1		
18	Madhepura	14	0.08	2.09	0.09	0.66	7	50	1	7.1	0	0	6	43	0	0	0	0	8	6		
19	Madhubani	20	0.05	1.33	0.03	1.62	6	30	0	0	0	0	14	70	0	0	0	0	6	14		
20	Munger	8	1.05	2.87	3.26	3.26	6	75	1	13	0	0	0	0	1	13	0	0	7	1		
21	Muzaffarpur	11	0.47	3.78	-	-	8	73	3	27	0	0	0	0	0	0	0	0	11	0		
22	Nalanda	36	0.41	4.67	0.09	1.79	15	42	17	47	1	3	3	8	0	0	0	0	33	3		
23	Nawada	15	0.35	2.93	0.02	5.39	8	53	3	20	0	0	3	20	0	0	1	7	11	4		
24	E champaran	6	0.37	2.16	-	-	5	83	1	17	0	0	0	0	0	0	0	0	6	0		
25	Patna	30	0.20	3.15	0.26	0.26	19	63	10	33	0	0	1	3	0	0	0	0	29	1		
26	E champaran	4	0.77	2.62	-	-	3	75	1	25	0	0	0	0	0	0	0	0	4	0		
27	Purnia	11	0.13	0.93	0.48	0.60	9	82	0	0	0	0	2	18	0	0	0	0	9	2		
28	Rohtas	18	0.07	3.03	0.07	1.15	13	72	2	11	0	0	3	17	0	0	0	0	15	3		
29	Saharsa	14	0.02	0.63	0.02	1.57	7	50	0	0	0	0	7	50	0	0	0	0	7	7		
30	Samastipur	13	1.22	5.22	1.38	1.38	3	23	6	46	3	23	1	8	0	0	0	0	12	1		
31	Saran	13	0.21	4.67	-	-	2	15	9	69	2	15	0	0	0	0	0	0	13	0		
32	Seikhpura	7	0.59	3.71	-	-	3	43	4	57	0	0	0	0	0	0	0	0	7	0		
33	Sheohar	2	0.54	0.54	-	-	2	100	0	0	0	0	0	0	0	0	0	0	2	0		
34	Sitamarhi	16	0.01	0.75	0.06	2.43	3	19	0	0	0	0	10	63	3	19	0	0	3	13		
35	Siwan	6	1.40	2.78	-	-	2	33	4	67	0	0	0	0	0	0	0	0	6	0		
36	Supaul	23	0.01	1.13	0.03	1.25	8	35	0	0	0	0	15	65	0	0	0	0	8	15		
37	Vaishali	19	0.62	5.12	-	-	4	21	11	58	4	21	0	0	0	0	0	0	19	0		
	Total	556	0.38	4.20		6.36	293	53	129	23	16	3	111	20	5	1	2	0	438	118		

3.4.3 Decadal Mean of November to November 2021

Fluctuation in water level during November 2021 with respect to decadal mean of November has been analysed for 615 HNS, which shows Rise of water level in 82% of the HNS and remaining fall. Major part (68%) of the State has shown water level rise in the range of 0 to 2m. The rise between 2 and 4 m has been observed in 12% of NHS analysed which covered an elongated area in central NBP and many localised areas in SBP. 14 HNS have shown water level rise > 4 m.

Distinct area of the state has shown fall in water level which cover major part of the districts located in Kosi mega fan and also West Champaran, East Champaran, Buxar, Bhojpur, Kaimur, Aurangabad, Rohtas and Arwal district. Only 5 HNS have shown fall of water level in the range of 2 to 4 m including areas in Aurangabad, Bhojpur, Rohtas district. No location has reported the water level fall of > 4m in the state. (Fig. 17, Table 18.)

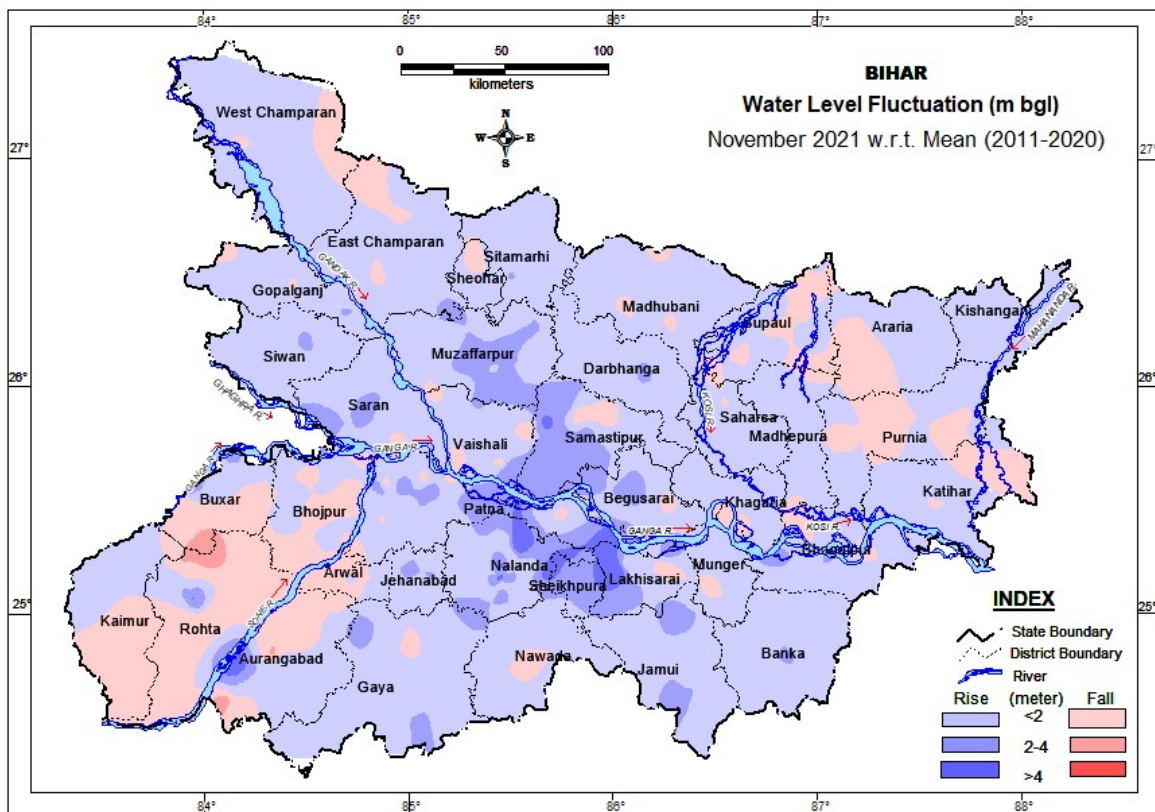


Figure 17: Fluctuation in water level between Nov. (mean) and Nov. 2021

Table 18: District-wise categorization of fluctuation and their frequency of water levels of HNS of Nov. 2021 w.r.t. Nov. mean (2011-2020) for Bihar State

SN	District	No. of HNS analysed	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation In the range of														Total	
			Rise		Fall		Rise						Fall									
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%	Rise	Fall		
1	Araria	8	0.10	0.46	0.03	0.68	5	63	0	0	0	0	3	38	0	0	0	0	0	5	3	
2	Aurangabad	10	0.09	4.94	0.21	2.67	4	40	0	0	1	10	3	30	2	20	0	0	0	5	5	
3	Banka	14	0.57	8.60	-	-	12	86	1	7	1	7	0	0	0	0	0	0	14	0		
4	Begusarai	36	0.43	3.56	0.11	1.47	29	81	5	14	0	0	2	6	0	0	0	0	34	2		
5	Bhagalpur	14	0.09	2.70	0.34	0.70	9	64	2	14	0	0	3	21	0	0	0	0	11	3		
6	Bhojpur	26	0.11	2.21	0.11	2.10	14	54	1	4	0	0	10	38	1	4	0	0	15	11		
7	Buxar	16	0.03	4.33	0.79	1.09	11	69	2	13	1	6	2	13	0	0	0	0	14	2		
8	Darbhanga	9	0.20	2.16	-	-	8	89	1	11	0	0	0	0	0	0	0	0	9	0		
9	Gaya	17	0.33	3.48	0.06	0.24	13	76	2	12	0	0	2	12	0	0	0	0	15	2		
10	Gopalganj	20	0.04	2.57	0.13	0.22	16	80	1	5	0	0	3	15	0	0	0	0	17	3		
11	Jamui	14	0.05	3.38	-	-	10	71	4	29	0	0	0	0	0	0	0	0	14	0		
12	Jehanabad	19	0.04	2.41	0.79	1.62	11	58	3	16	0	0	5	26	0	0	0	0	14	5		
13	Kaimur	5	0.47	1.72	0.26	1.54	3	60	0	0	0	0	2	40	0	0	0	0	3	2		
14	Katihar	14	0.06	1.09	0.13	0.44	11	79	0	0	0	0	3	21	0	0	0	0	11	3		
15	Khagaria	18	0.26	1.78	0.85	0.85	17	94	0	0	0	0	1	6	0	0	0	0	17	1		
16	Kishanganj	9	0.08	1.96	0.06	0.50	4	44	0	0	0	0	5	56	0	0	0	0	4	5		
17	Lakhisarai	9	0.56	4.52	0.12	1.36	4	44	2	22	1	11	2	22	0	0	0	0	7	2		
18	Madhepura	16	0.02	1.26	-	-	16	##	0	0	0	0	0	0	0	0	0	0	16	0		
19	Madhubani	23	0.07	1.93	0.04	0.26	21	91	0	0	0	0	2	9	0	0	0	0	21	2		
20	Munger	8	0.72	1.53	0.35	1.60	6	75	0	0	0	0	2	25	0	0	0	0	6	2		
21	Muzaffarpur	24	0.07	2.97	-	-	14	58	10	42	0	0	0	0	0	0	0	0	24	0		
22	Nalanda	31	0.35	6.06	0.05	0.40	16	52	8	26	5	16	2	6	0	0	0	0	29	2		
23	Nawada	13	0.29	1.91	0.36	0.54	11	85	0	0	0	0	2	15	0	0	0	0	11	2		
24	Pashchim champaran	11	0.03	1.49	0.22	0.22	10	91	0	0	0	0	1	9	0	0	0	0	10	1		
25	Patna	32	0.27	5.88	0.08	1.79	19	59	5	16	3	9	5	16	0	0	0	0	27	5		
26	Purba champaran	27	0.08	2.58	0.06	1.06	19	70	1	4	0	0	7	26	0	0	0	0	20	7		
27	Purnia	18	0.05	0.99	0.13	1.12	12	67	0	0	0	0	6	33	0	0	0	0	12	6		
28	Rohtas	14	0.31	4.08	0.02	2.66	1	7	1	7	1	7	9	64	2	14	0	0	3	11		
29	Saharsa	18	0.01	1.04	0.14	0.21	16	89	0	0	0	0	2	11	0	0	0	0	16	2		
30	Samastipur	20	1.35	4.30	0.44	0.75	4	20	13	65	1	5	2	10	0	0	0	0	18	2		
31	Saran	16	0.54	3.22	0.67	0.67	13	81	2	13	0	0	1	6	0	0	0	0	15	1		
32	Seikhpura	7	0.38	3.37	-	-	5	71	2	29	0	0	0	0	0	0	0	0	7	0		
33	Sheohar	4	0.36	1.72	0.20	0.37	2	50	0	0	0	0	2	50	0	0	0	0	2	2		
34	Sitamarhi	16	0.01	2.06	0.12	0.12	14	88	1	6	0	0	1	6	0	0	0	0	15	1		
35	Siwan	15	0.08	2.38	-	-	14	93	1	7	0	0	0	0	0	0	0	0	15	0		
36	Supaul	22	0.03	1.38	0.04	0.40	10	45	0	0	0	0	12	55	0	0	0	0	10	12		
37	Vaishali	22	0.28	3.06	0.21	1.06	13	59	4	18	0	0	5	23	0	0	0	0	17	5		
38	Total	615	0.46	1.35	0.00	2.67	417	68	72	12	14	2	107	17	5	1	0	0	503	112		

3.4.4 Decadal Mean of January to January 2022

Fluctuation in water level of January 2021 with respect to decadal mean of January has been analysed for 640 HNS. In 82% of the HNS, rise in water level is recorded and remaining in fall. The rise up to 2 m has covered major part (61%) of the state. Few Patches mostly in central part of the State has shown rise in the range of 2 to 4 m. Total 20 HNS have shown more than 4 m rise in water level, out of which 7 wells are located in Nalanda while rest are in Aurangabad, Begusarai, Rohtas, Patna, Samastipur, Saran, East Champaran and West Champaran.

Water level fall of 0 to 2 m is seen in eastern part of NBP including major part of Araria, Purnia, Kishanganj, Katihar district. Few localised areas, mostly in Bhojpur, Buxar, Munger, Rohtas, Saharsa district have shown fall between 2 and 4 m. The fall of water level >4 m is reported at only one HNS location in Khagaria. (Fig. 18, Table 19).

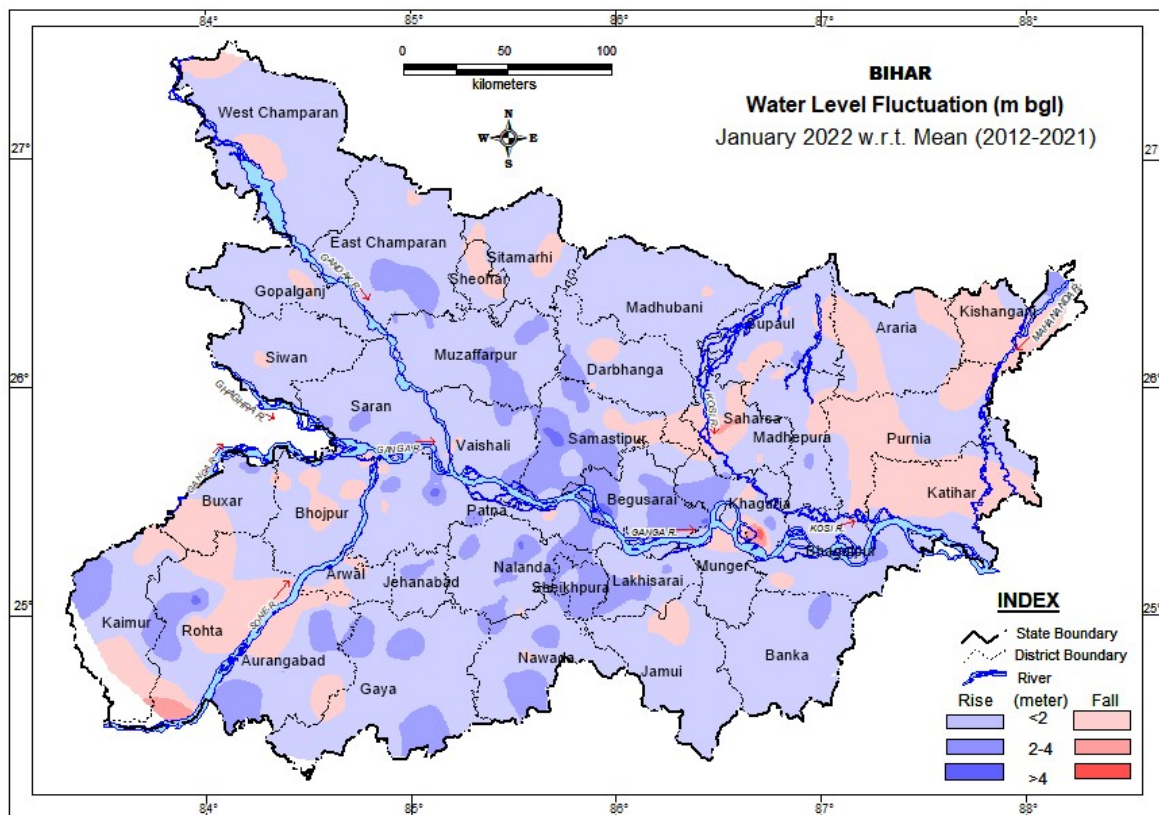


Figure 18: Fluctuation in water level between Jan. (mean) and Jan. 2022

Table 19: District-wise categorization of fluctuation and their frequency of water levels of HNS of Jan. 2022 w.r.t. Jan. mean (2012-2021) for Bihar State																						
SN	District	No. of HNS analysed	Range of fluctuation (m)				No. of Wells / Percentage showing fluctuation in the range of														Total	
			Rise		Fall		Rise						Fall									
			Min.	Max.	Min.	Max.	<2m	%	2-4m	%	>4m	%	<2m	%	2-4m	%	>4m	%				
1	Araria	7	0.07	0.56	0.28	0.30	5	71	0	0	0	0	2	29	0	0	0	0	5	2		
2	Aurangabad	11	0.75	4.02	0.22	1.45	3	27	3	27	1	9	4	36	0	0	0	0	7	4		
3	Banka	12	0.15	2.98	-	-	11	92	1	8	0	0	0	0	0	0	0	0	12	0		
4	Begusarai	35	1.05	5.00	-	-	11	31	20	57	4	11	0	0	0	0	0	0	35	0		
5	Bhagalpur	14	0.01	3.09	0.32	0.32	12	86	1	7	0	0	1	7	0	0	0	0	13	1		
6	Bhojpur	31	0.02	3.04	0.18	2.44	23	74	1	3	0	0	6	19	1	3	0	0	24	7		
7	Buxar	17	0.16	3.72	0.27	2.34	10	59	3	18	0	0	3	18	1	6	0	0	13	4		
8	Darbhanga	10	0.17	1.84	0.43	0.55	8	80	0	0	0	0	2	20	0	0	0	0	8	2		
9	Gaya	18	0.24	3.59	0.09	0.09	13	72	4	22	0	0	1	6	0	0	0	0	17	1		
10	Gopalganj	19	0.03	1.78	0.17	0.21	17	89	0	0	0	0	2	11	0	0	0	0	17	2		
11	Jamui	11	0.05	3.69	0.43	1.08	8	73	1	9	0	0	2	18	0	0	0	0	9	2		
12	Jehanabad	18	0.11	2.58	0.15	0.92	12	67	2	11	0	0	4	22	0	0	0	0	14	4		
13	Kaimur	8	0.73	2.98	1.07	1.10	4	50	2	25	0	0	2	25	0	0	0	0	6	2		
14	Katihar	14	0.04	1.42	0.05	0.38	3	21	0	0	0	0	11	79	0	0	0	0	3	11		
15	Khagaria	19	0.37	3.80	0.20	4.73	6	32	10	53	0	0	2	11	0	0	1	5	16	3		
16	Kishanganj	8	2.66	2.66	0.02	0.54	0	0	1	13	0	0	7	88	0	0	0	0	1	7		
17	Lakhisarai	9	0.16	3.78	1.60	1.60	6	67	2	22	0	0	1	11	0	0	0	0	8	1		
18	Madhepura	17	0.04	2.47	0.27	1.43	12	71	1	6	0	0	4	24	0	0	0	0	13	4		
19	Madhubani	24	0.11	1.30	0.02	0.60	21	88	0	0	0	0	3	13	0	0	0	0	21	3		
20	Munger	7	0.20	1.94	2.01	2.01	6	86	0	0	0	0	0	0	1	14	0	0	6	1		
21	Muzaffarpur	25	0.27	3.64	-	-	16	64	9	36	0	0	0	0	0	0	0	0	25	0		
22	Nalanda	36	0.14	5.02	0.04	0.86	19	53	6	17	7	19	4	11	0	0	0	0	32	4		
23	Nawada	16	0.04	3.03	0.05	0.07	11	69	3	19	0	0	2	13	0	0	0	0	14	2		
24	W champaran	13	0.04	4.14	0.08	0.46	9	69	0	0	1	8	3	23	0	0	0	0	10	3		
25	Patna	26	0.02	4.94	0.21	0.41	18	69	3	12	2	8	3	12	0	0	0	0	23	3		
26	E champaran	29	0.07	4.09	0.37	0.44	25	86	1	3	1	3	2	7	0	0	0	0	27	2		
27	Purnia	15	0.03	0.27	0.03	0.78	5	33	0	0	0	0	10	67	0	0	0	0	5	10		
28	Rohtas	17	0.07	4.56	0.04	3.15	6	35	3	18	1	6	6	35	1	6	0	0	10	7		
29	Saharsa	17	0.45	1.40	0.08	2.23	8	47	0	0	0	0	7	41	2	12	0	0	8	9		
30	Samastipur	23	0.11	5.19	0.21	0.43	6	26	13	57	2	9	2	9	0	0	0	0	21	2		
31	Saran	26	0.01	4.05	0.66	0.66	18	69	6	23	1	4	1	4	0	0	0	0	25	1		
32	Seikhpura	7	0.76	3.70	-	-	1	14	6	86	0	0	0	0	0	0	0	0	7	0		
33	Sheohar	4	0.16	0.16	0.18	0.80	1	25	0	0	0	0	3	75	0	0	0	0	1	3		
34	Sitamarhi	15	0.07	1.59	0.05	0.05	14	93	0	0	0	0	1	7	0	0	0	0	14	1		
35	Siwan	13	0.28	1.56	0.10	0.10	12	92	0	0	0	0	1	8	0	0	0	0	12	1		
36	Supaul	24	0.06	2.23	0.01	1.34	15	63	2	8	0	0	7	29	0	0	0	0	17	7		
37	Vaishali	25	0.44	3.16	0.04	0.04	17	68	7	28	0	0	1	4	0	0	0	0	24	1		
	Total	640	0.16	2.66	0.00	4.73	392	61	111	17	20	3	110	17	6	1	1	0	523	117		

4. HYDROCHEMISTRY

In order to assess the chemical quality of ground water of phreatic aquifers of Bihar, 252 ground water samples have been collected during May 2020 and analysed for 16 major parameters viz. pH, EC, TDS, TH, Ca^{2+} , Mg^{2+} , Na^+ , K^+ , CO_3^{2-} , HCO_3^- , Cl^- , SO_4^{2-} , NO_3^- , F^- , PO_4^{3-} , SiO_2 . The ground water sampling in the year 2021 is badly affected by Covid-19 pandemic. Results of the complete chemical analysis of the ground water samples are given in Annexure-II. A perusal of the **Annexure-II** indicates that the water is by and large suitable for domestic and drinking purposes. The pH of ground water mostly lies between 7.09 and 8.2. Majority of the ground water samples are mildly alkaline in nature. The EC ranged from 252 to 2670 $\mu\text{S}/\text{cm}$ with the average value of 799 $\mu\text{S}/\text{cm}$ @ 25°C.

Table 20: Calculated Minimum & Maximum and Median value of Chemical Parameters

Chemical Parameter	No of sample	Min.	Q1	Median	Q3	Max.	Mean	Std. Dev
Ca^{2+}	277	8	24	34	50	254	41.84	30.00
Mg^{2+}	277	1	15	34	57	208	39.20	30.69
$\text{Na}^+ + \text{K}^+$	277	8	25	44	80	297	63.16	53.43
HCO_3^-	277	67	189	256	336	933	277.86	126.76
Cl^-	277	7	25	46	110	440	75.44	75.98
SO_4^{2-}	277	1	14	28	56	233	41.09	39.50
NO_3^-	277	0	3.73	16	35	105	22.01	21.74

The Box and Whisker plot shows the central tendency, dispersion and outliers within a data set for individual cation and anion. The mean value has been shown as small circle and median value as a line within the box. The box represents 50% of the total data. The data for each parameter as shown in **figure** are skewed. Comparatively higher value of bicarbonate ions was found as shown in the figure whereas nitrate values are comparatively very less.

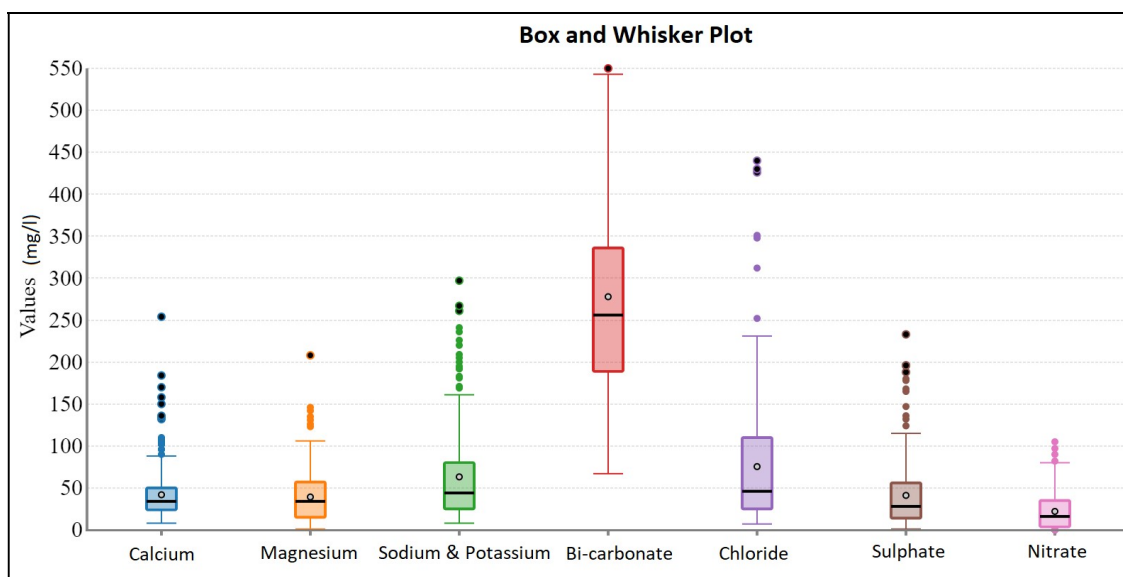


Figure 19: Box and Whiskar Plot

Electrical Conductivity

The **map** has been prepared by using Mapinfo™ software by interpolation method to show the spatial variation of EC values. The area has been categorized based on the USSSL diagram, About 50% of the area covered ha showed the EC value less than 750 $\mu\text{S}/\text{cm}$ and rest are within 750 to 2250 $\mu\text{S}/\text{cm}$ @25°C. In two samples collected from Sheikhpura and Nalanda district, EC value has been found to be >2250 $\mu\text{S}/\text{cm}$ @25°C, due to some localised anthropogenic activities.

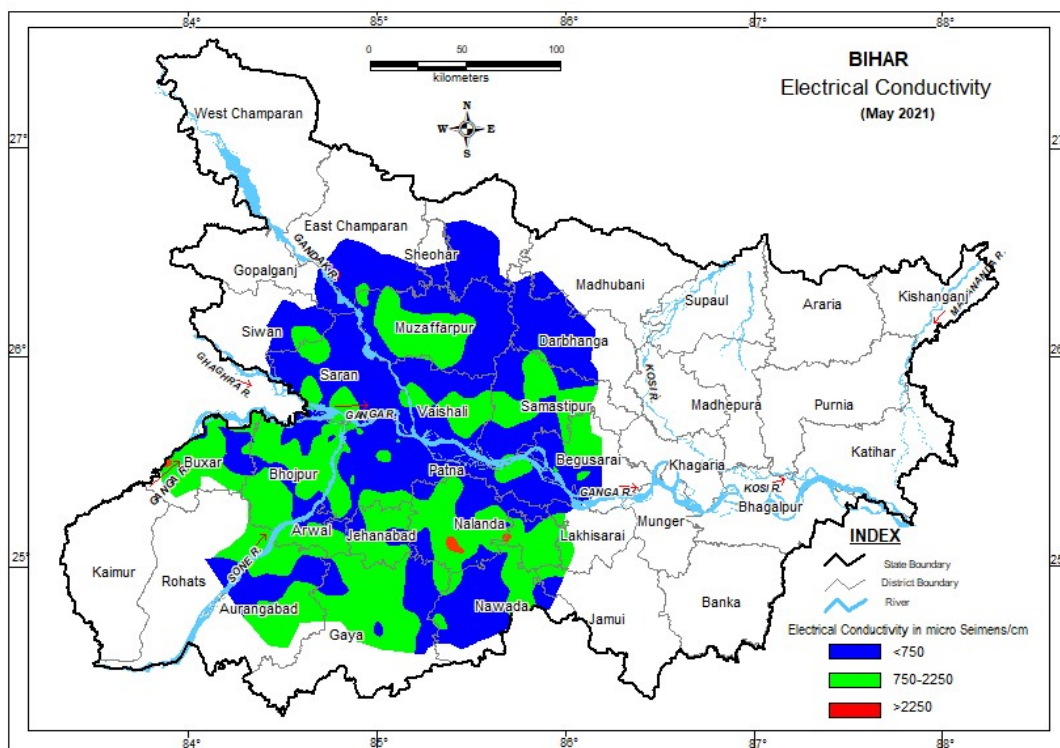


Figure 20: Electrical Conductivity Map

Bi-carbonate

The bicarbonate values ranged from 63 to 933 mg/l. Similar to the EC map, Bi-carbonate map has been prepared in which the area has been categorized based on the permissible limit and acceptable limit of BIS 2012. The **Figure** reveals that almost entire area covered is within the permissible limit of 600 mg/l. There are some localized areas where bicarbonate value has been found within the acceptable limit of 200 mg/l. In total five locations in Nalanda, Nawada, Sheikhpura and Buxar district Bicarbonate values were greater than 600 mg/l.

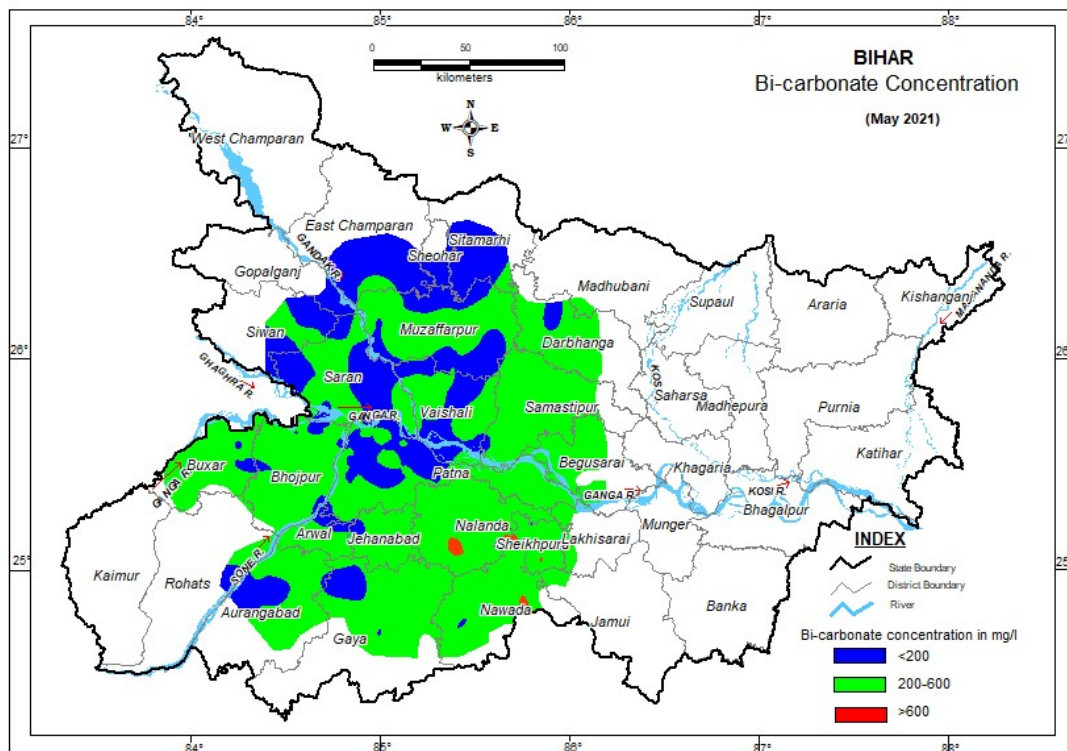


Figure 21: Bi-carbonate Map

5. RAINFALL DATA ANALYSIS

Bihar experiences rainfall mainly during Southwest monsoon season (June to September). Fig.4 shows the annual departure of rainfall in different districts of Bihar. The anomalies were computed based on the LPA period of 1961-2010. Out of 38 districts of the state, 1 received deficient rainfall (-20% to -59% of its 1961-2010 period LPA), 16 districts received normal rainfall (-19% to +19% of its LPA), 18 received excess rainfall (20% to 59% of its LPA), 3 received large excess (60% or more of its LPA) rainfall.

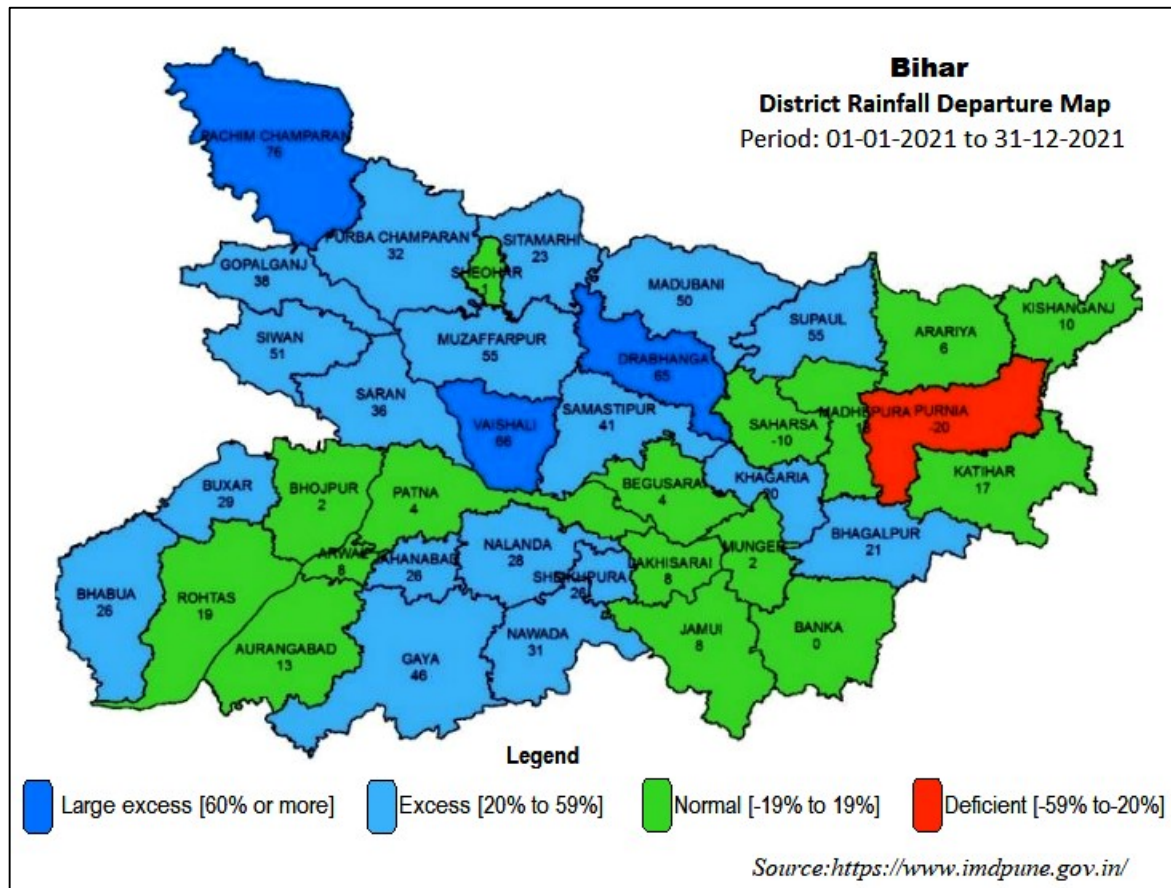


Figure 22: District Rainfall Departure Map

Standardized Precipitation Index (SPI): The SPI is based on precipitation and used for measuring drought. This index is negative for drought and positive for wet conditions. As the wet and dry conditions become more severe, the index becomes more positive or negative. Extremely wet/severely wet conditions were observed over parts of Champaran. West, Darbhanga, Gaya, Gopalganj, Madhubani, Muzaffarpur, Samastipur, Siwan, Vaishali districts while mildly /moderately wet conditions were observed over other districts of the state except Purnea district which observed mildly dry condition.

Source: <https://www.imdpune.gov.in/>

6. TREND ANALYSIS DURING PRE AND POST MONSOON

Trend of the ground water level for the last ten year (2012-2021) have been analyzed. District wise percentage of well showing rise, fall and no significant trend during Pre- Monsoon and Post Monsoon season has been prepared and given in the Annexure – III. It has been observed from long term water level trend data that more than 50% NHS wells have shown rising trend in 24 districts in premonsoon period and 30 districts in Postmonsoon period.

Depth to Water Level (m bgl) in Various Seasons:- 2021-22

State : Bihar

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Araria	Araria		2.29	3.4	3.62
Araria	Bhargama		2.04	2.85	2.68
Araria	Bathnaha 1		2.51	2.65	3.42
Araria	Haripur		1.63	2.32	3.02
Araria	Matiyari		2.01	2.43	3.05
Araria	Jokihat1		1.93	1.93	2.62
Araria	Palasi		2.55	2.22	
Araria	Raniganj		1.68	3.33	3.85
Aurangabad	Aurangabad	0.6	0.6	0.78	0.8
Aurangabad	Pandrawan		1.69	4.35	4.9
Aurangabad	Barun		8.18	Partially filled	Partially filled
Aurangabad	Narari Kala		9.04	3.7	
Aurangabad	Daudnagar	5.6	3.25	4.6	4.6
Aurangabad	Deol	5.1	1	2.02	2.34
Aurangabad	Deohara_goh		7.73	9.82	9.48
Aurangabad	Dhobi Tola_Goh	2.39	2.13	2.66	3.56
Aurangabad	Etwan		1.8	3.81	2.9
Aurangabad	Madanpur		2.9	Partially filled	4.7
Aurangabad	Pataya		0.72	Could not be located	2
Aurangabad	Dhanibar		3.72	Could not be located	4.3
Aurangabad	Mahauli		2.8	4.05	
Aurangabad	Nabinagar dbib		0.3	3.52	
Aurangabad	Obra		3.4	4.93	
Aurangabad	Rafiganj		10.25	Dry	Dry
Aurangabad	Tineri Morh	2.35	0.94	2.57	2.6
Banka	English More		0.75	1.59	1.79
Banka	Rampur		0.78	1.79	2.2
Banka	Banka ps		0.58	1.54	2.69
Banka	Barahat		0.91	1.62	2.54
Banka	Baunsi		2.35	3.75	4.44
Banka	Chandan		1.64	2.57	3.47
Banka	Panjwara		3.57	3.58	
Banka	Katoria		1.88	3.59	5.19
Banka	Rajaun ps		4.27	4.75	3.51
Banka	Fulidumer		0.67	1.24	3.3
Banka	Kharharia		1.14	1.56	1.9
Banka	Mirjapur		1.99	1.89	2.83
Banka	Sambhuganj		1.37	2.02	3.14
Begusarai	Baraun mile	3.16	1.8	2.72	0.9
Begusarai	Kumharson		1.24	2.04	1.61
Begusarai	Naya Nagar Dularpur	2.89	0.85	1.08	2.24
Begusarai	Teghra		1.8	4.93	2.24
Begusarai	Bagrash		3.69	3.96	2.58
Begusarai	Bakhari salauna		3.47	3.45	3.12
Begusarai	Manjaul	4.2	1.98	1.8	3.79
Begusarai	Peernagar		3.23	3.76	2.47
Begusarai	Simri		1.92	3.05	3.01
Begusarai	Badi Balia		2.31	4.04	3.05

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Begusarai	Bariarpur		1.92	2.7	1.45
Begusarai	Chhoti Balia		2.65	2.34	4.03
Begusarai	Laxminia		0.98	5.2	2.45
Begusarai	Parihara		3.1	4.4	2.7
Begusarai	Rahatpur		2.01	2.84	2.7
Begusarai	Begusarai	6.02	1.88	2.2	3.42
Begusarai	Harpur	3.3	2.51	0.76	1.93
Begusarai	Barieghu		3.02	3.61	4.53
Begusarai	Begusarai fc_ib	4.8	1.52	1.5	2.65
Begusarai	Gopalpur		2.32	2.49	2.01
Begusarai	Haridia	3.6	2.21	2.66	2.5
Begusarai	Kaithma		3.68	3.43	3.82
Begusarai	Lakho		2.68	2.58	2.08
Begusarai	Matihani		1.96	4.45	Damaged
Begusarai	Mohanpur Usrai	6.16	Could not be located	2.56	4.7
Begusarai	Pokharia		2.1	3.4	2.59
Begusarai	Aghara		3.42	3.85	3.89
Begusarai	Cheriabariarpur		3.96	1.53	3.28
Begusarai	Kumbhidera		2.1	2.2	2.37
Begusarai	Badalpura		3.51	3.81	5.06
Begusarai	Dariarpur		Garbage	4	3.28
Begusarai	Bintoli		2.93	3.34	4.05
Begusarai	Heera Tola		Garbage	5.03	3.65
Begusarai	New Jafar Nagar		2.68	2.1	1.7
Begusarai	Raghunathpur		1.92	4.07	2.7
Begusarai	Sabdapur		1.95	5.05	3.15
Bhagalpur	Bihpur ib		Temp. non-approachable	3.02	4.42
Bhagalpur	Marwa		0.88	3.45	4.35
Bhagalpur	Ghoga rly stn		1.33	1.15	1.35
Bhagalpur	Harchandpur		1.28	2.18	1.99
Bhagalpur	Jagnathpur		Temp. non-approachable	Temp. non-approachable	3.64
Bhagalpur	Madrauni Chowk		0.71	2.34	3.05
Bhagalpur	Bhagalpur city		11.4	10.69	10.76
Bhagalpur	Jagadishpur		0.34	1.02	0.97
Bhagalpur	Naugachhia h.s		0.88	2.04	4.65
Bhagalpur	Pirpainti db.ib		Temp. non-approachable	Temp. non-approachable	4.18
Bhagalpur	Sabaur		1.42	1.61	2.07
Bhagalpur	Shahkund db.ib		2.37	3.84	5.23
Bhagalpur	Akbarnagar stn		1.07	0.97	2.7
Bhagalpur	Asarganj		1.22	2.85	3.11
Bhagalpur	Sultanganj		2.05	2.9	6.46
Bhojpur	Birampur	10.8	Could not be located	Could not be located	3.69
Bhojpur	Farhda		2.34	3.11	4.2
Bhojpur	Jarawarpur Milki	5.01	1.84	4.84	5.6
Bhojpur	Bakhorapur	7.31	3.15	4.32	4.84
Bhojpur	Balua	10.15	4.15	7.53	8.27
Bhojpur	Barahara	9.33	3.5	4.72	4.91
Bhojpur	Dhusaria	8.63	2.53	7.24	8.43
Bhojpur	Ekauna	10.1	3.18	7.84	8.72
Bhojpur	Farhda	6.68	2.51	4.71	5.5
Bhojpur	Jagatpur	7.84	1.9	1.79	4.3

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Bhojpur	Milki		1.53	1.82	3.05
Bhojpur	Simariya	7.6	2.8	Partially filled	Partially filled
Bhojpur	Bihiya	4.1	1.1	2.78	3.15
Bhojpur	Garhani	3.19	1.35	3.93	4.6
Bhojpur	Jagadishpur I	3.07	2.02	2.83	3.1
Bhojpur	Birampur		3.26	Could not be located	Dry
Bhojpur	Giddha		2.97	4.82	5.38
Bhojpur	Inglishpur		3.15	5.17	5.6
Bhojpur	Kulharia		Damaged	Damaged	5.27
Bhojpur	Lodhipur	6.3	3.42	Concrete Seal.	Concrete Seal.
Bhojpur	Mokhlisa		3.98	4.92	5.35
Bhojpur	Muhammadpur		4.25	4.69	6.1
Bhojpur	Pachrukhiya		3.24	6.33	6.7
Bhojpur	Sakkadi		2.13	6.89	8.1
Bhojpur	Songhata		4.5	3.6	6.35
Bhojpur	Pirro		3.38	Partially filled	Partially filled
Bhojpur	Baruna		0.88	2.43	3.25
Bhojpur	Guljarpur	4.06	1.72	3.91	4.45
Bhojpur	Kori	4.71	2.22	3.79	4.33
Bhojpur	Nasratpur	6.14	3.02	5.42	6.42
Bhojpur	Pauna		0.9	3.64	3.84
Bhojpur	Sandesh	3.1	0.77	1.38	2.17
Bhojpur	Karnempur	5.15	1.52	3.64	3.75
Bhojpur	Chandawa	3.11	0.57	2.38	3.25
Bhojpur	Harnath Kundi	2.13	1.45	2.68	3.26
Bhojpur	Kasap	1.8	0.58	1.73	2.64
Bhojpur	Sasaram Chota	5.23	1.86	3.56	4.4
Bhojpur	Udwantnagar	1.97	1	1.66	2.25
Buxar	Bagen Bazar	6.82	4	Damaged	Damaged
Buxar	Barhampur	3.32	1.8	Damaged	Damaged
Buxar	Hathilpur	5.22	2.1	4.16	5.27
Buxar	Jugia Dera		3.65	4.74	5.43
Buxar	Mharajgunj	2.1	1.22	3.56	4.33
Buxar	Raghunathpur	7.25	2.95	Dry	Dry
Buxar	Buxar	6.12	0.93	4.62	5.31
Buxar	Chausa	3.27	1.8	2.62	3.68
Buxar	Churamanpur DW	8.46	6.15	Damaged	Damaged
Buxar	Danikutia	4.27	1.34	2.27	2.36
Buxar	Dudharchak	10.7	6.41	5.68	7.41
Buxar	Kamarpur		Could not be located	2.52	Could not be located
Buxar	Kritpur	2.18	1.26	1.48	2.49
Buxar	Mishrvalia	3.84	1.1	1.52	2.51
Buxar	Thodagaon	10.75	Damaged	Damaged	Damaged
Buxar	Dumraon	8.41	Dry	Dry	6.11
Buxar	Rajpur	1.75	0.59	0.78	1.78
Buxar	Barka Rajpur	9.6	2.53	3.76	5.23
Buxar	Dumri	7.6	1.81	2.17	3.65
Buxar	Durasan		2.1	4.96	6.15
Buxar	Karathar	2.45	3.33	Could not be located	Could not be located
Buxar	Manikpur	9.2	4.94	5.05	5.63
Buxar	Neazipur	3.16	2.31	1.23	2.57
Darbhangha	Darbhangha	1.41	2.13	1.4	2.32

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Darbhanga	Bithauli	0.3	4.16	2.18	2.64
Darbhanga	Jorja	3.88	3.17	2.67	3.01
Darbhanga	Bahera		2.95	1.2	2.7
Darbhanga	Baheri 1	3.39	2.09	1.22	1.52
Darbhanga	Pouram		2.75	1.92	2.47
Darbhanga	Rustampur		Could not be located	Could not be located	1.91
Darbhanga	Keoti		2.05	1.42	2.02
Darbhanga	Sakari 1	3.08	1.24	1.9	2.47
Darbhanga	Simri	3.19	1.68	1.57	2.17
Gaya	Akauna		1.15	1.35	2.96
Gaya	Banke Bazar		2.13	2.88	3.88
Gaya	Bhadeya		0.3	1.14	2.4
Gaya	Dobhi		3.7	3.5	4.5
Gaya	Bodh Gaya		3.24	3.3	3.4
Gaya	Magra		1.2	1.7	3.17
Gaya	Baraila More	1.38	Partially filled	Partially filled	Partially filled
Gaya	Fatehpur		2.8	3.15	4.4
Gaya	Bitho Sharif 1		Dry	7	7
Gaya	Chand Chowra Chowk		1.83	4.53	5.63
Gaya	Ram Kund	4.45	4.71	5.06	5.5
Gaya	Sangat Gali	2.1	3.35	5.65	6.07
Gaya	Guraru		0.7	1.42	2.85
Gaya	Raghunath Khap		0.98	1.55	2.9
Gaya	Baseta		1.03	1.73	2.49
Gaya	Konch	10	2.95	3.57	4.69
Gaya	Manpur		2.6	Partially filled	Partially filled
Gaya	Dangra More		1.74	1.74	2.04
Gaya	Tekari	7	Dry	2.15	2.85
Gaya	Wazirganj	0.8	0.3	1.08	2.1
Gopalganj	Manjwalia		Could not be located	2.23	2.28
Gopalganj	Barauli		1.08	1.38	1.69
Gopalganj	Bhojpurwa		Could not be located	1.65	1.92
Gopalganj	Bhore		0.05	1.8	Partially filled
Gopalganj	Rampur2		0.45	1.75	2.09
Gopalganj	Turkaha		0.24	1.24	1.5
Gopalganj	Yadavpur Dubeytola		0.3	1.64	1.64
Gopalganj	Hathua 1		0.65	1.6	2
Gopalganj	Jamunaha	3.59	2.11	3.58	4.06
Gopalganj	Katiya		1.32	2.66	2.42
Gopalganj	Lala Pachmawa		0.7	2.7	2.1
Gopalganj	Misirbatha 1		1.05	3.3	3.1
Gopalganj	Jalalpur2		1	2.02	2.56
Gopalganj	Kuchaikot		Damaged	1.64	Damaged
Gopalganj	Bangra		1.16	1.9	2.1
Gopalganj	Bangra Deoria		0.92	1.58	1.84
Gopalganj	Bishambarpur		1.95	2.33	2.53
Gopalganj	Lachchwar		0.94	1.8	1.82
Gopalganj	Manjhwa 1		2.29	2.53	2.4
Gopalganj	Nunachapra		0.72		1.79
Gopalganj	Phulwariya		0.89	1.71	1.81
Jamui	Chakai		3.77	4.14	4.6
Jamui	Chakai B		3.39	4.02	Dry

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Jamui	Tarakhakhar		Could not be located	8.36	9.97
Jamui	Aghara		2.59	2.83	5.7
Jamui	Jamui		7.07	Could not be located	8.76
Jamui	Manjhwe		1.05	1.35	4.21
Jamui	Ambedkar Nagar		1.33	1.82	2.39
Jamui	Chandramanita		1.53	2.02	2.79
Jamui	Harna		2.22	2.51	4.34
Jamui	Jhajha		7.87	8.52	Dry
Jamui	Gidhaur O		7.07	Dry	Dry
Jamui	Purna Khaira		1.05	1.53	2.26
Jamui	Lalmatia		2.42	3.4	7.64
Jamui	Laxmipur		0.58	0.97	2.91
Jamui	Batia I		9.67	10.56	Dry
Jamui	Sono		3.15	3.78	4.73
Arwal	Arwal I	1.71	3.71	5.88	5.88
Arwal	Dirpal Bigha	1.83	1.3	3.71	3.5
Arwal	Madhubani		2.43	4.38	3.97
Jehanabad	Dholakpur		2.65	2.93	3.55
Jehanabad	Ghoshi	4.3	1.6	1.65	2.7
Jehanabad	Hulasganj	3.29	2.35	2.92	3.75
Jehanabad	Kako		2.6	2.67	2.8
Jehanabad	Lakhwar		1.35	1.62	2.45
Jehanabad	Gaurakhini	5.07	3.87	3.84	4.47
Jehanabad	Jahanabad hosp.		1.1	1.18	Damaged
Jehanabad	Teni Bigha		1.15	1.05	1.15
Arwal	Bairbigha	5.25	2.63	4.29	3.75
Arwal	Bansi Surajpur		1.58	5.22	3.1
Arwal	Imamganj	3.12	2.03	4.17	4.22
Arwal	Kinjer		2.88	5.45	5.33
Arwal	Jhunathi	3.91	Water Logged	4.52	3.74
Arwal	Kurtha bdo	1.43	1.46	2.4	1.6
Jehanabad	Alubikha	2.3	1.96	2.26	2.56
Jehanabad	Makhdumpur		2.6	2.8	3.3
Kaimur	Adhaura		3	Could not be located	Temp. non-approachable
Kaimur	Bhabhua		6.27	9.3	10.24
Kaimur	Saraiya		5.6	7.97	9.12
Kaimur	Tori f.ck.post		2.67	5.11	5.3
Kaimur	Chainpur		1.84	4.5	5.27
Kaimur	Khariava		1.52	3.67	3.82
Kaimur	Chand in p.s.		0.98	0.94	1.35
Kaimur	Nuawan		2.59	Could not be located	Could not be located
Kaimur	Mohania		1.9	Locked premises	Locked premises
Kaimur	Bandipur		1.8	4.06	5.38
Kaimur	Bevnaliya		2.4	3.85	3.92
Katihar	Barari-1			2.76	4.84
Katihar	Dumaria		2.79	4.15	4.95
Katihar	Kursela		2.26	3.35	5.65
Katihar	Paranpur		2.7	2.15	
Katihar	Mahendrapur		1.71	2.92	3.77
Katihar	Narahaiya		2.5	2.65	3.7
Katihar	Kadwa		2.1	3.9	4.23

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Katihar	Sonauli	3.14	2.8	2.83	3.23
Katihar	Hafla l		2.27	2.67	3.28
Katihar	Katihar		1.45	2.63	4.02
Katihar	Khiria		3.47	3.23	4.37
Katihar	Korha		3.25	3.2	4.15
Katihar	Manihari		3.25	4.1	4.48
Katihar	Basantpur		3.09	2.5	3.75
Katihar	Bastaul l		2.55	Could not be located	3.74
Khagaria	Pirnasara		Could not be located	3.07	3.25
Khagaria	Basantpur		0.72	1	4.1
Khagaria	Chautham		0.8	2.33	4.64
Khagaria	Maheshkhunt l		3.01	Blocked	3.35
Khagaria	Gandhinagar		1.21	1.2	3.15
Khagaria	Jamalpur		0.6	3.33	4.5
Khagaria	Maheshkhunt _Lohiya		0.96	2.7	3.55
Khagaria	Maheshkunt		2.1	1.78	3.55
Khagaria	Durgapur		2	3.95	3.35
Khagaria	Gangaut		3.01	3.83	3.25
Khagaria	Ismailpur		1.92	4.11	3.35
Khagaria	Kasimpur		1.73	3.53	3.3
Khagaria	Khagaria		1.4	2.94	3.85
Khagaria	Labhgaon		2.06	4.4	3.35
Khagaria	Ranko		2.32	2.9	3.25
Khagaria	Sabalpur		3.63	3.9	3.6
Khagaria	Sonhauili		1.92	4.37	3.62
Khagaria	Dewri		1.1	1.01	6.9
Khagaria	Mohaddipur		0.65	3.55	3.18
Kishanganj	Bahadurganj B	3.72	2.28	2.58	3.84
Kishanganj	Gunsagar		1.83	2.43	3.25
Kishanganj	Kishanganj		1.96	2.37	3.1
Kishanganj	Bhagalbari		2.54	3.1	4.02
Kishanganj	Kochadhamin		1.58	2.25	3.45
Kishanganj	Kaswa Kaliganj		1.55	2.12	2.45
Kishanganj	Teragachhi		1.8	3.01	3.67
Kishanganj	Thakurganj		2.96	5.85	6.65
Lakhisarai	Dariyapur		1.83	5.44	6.92
Lakhisarai	Barhaiya		1.18	1.81	6.32
Lakhisarai	Kiul l		1.18	1	1.33
Lakhisarai	Lakhisarai		6.95	8.27	8.78
Lakhisarai	Surajgarha l		0.99	1.12	1.81
Lakhisarai	Arma		1.31	4.19	1.79
Lakhisarai	Kajra		Temp. non-approachable	1.96	2.56
Lakhisarai	Rishi Paharpur		0.69	1.15	5.63
Lakhisarai	Saidpur		2.09	2.83	3.74
Madhepura	Abhiyatola		3.12	3.47	2.9
Madhepura	Chausa l		1.8	2.4	2.6
Madhepura	Ganeshpur		0.69	1.12	2.8
Madhepura	Bhimpura		1.67	2.3	3
Madhepura	Hatkora bazar		1.73	2.04	2.2
Madhepura	Madhepura		3.1	Dry	4.4
Madhepura	Surajganj		2.13	1.29	2.08
Madhepura	Gaushala Chowk		Temp. non-approachable	2.8	2.8

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Madhepura	Murliganj		Temp. non-approachable	2.01	2.46
Madhepura	Rajui Rajni		Temp. non-approachable	2.27	3.09
Madhepura	Rampur		2.09	2.87	5.02
Madhepura	Barahari		2.02	2.44	3.82
Madhepura	Jiwachhapur		2.83	3.08	3.52
Madhepura	Singeswar		2.93	2.87	3.46
Madhepura	Gwalpara			2.1	2.25
Madhepura	Kusthan		2.1	2.59	2.19
Madhepura	Uda Kishanganj		2.87	3.12	1.45
Madhubani	Harri		Could not be located	Could not be located	2
Madhubani	Babubarhi		1.75	Damaged	Damaged
Madhubani	Narar		2.44	1.14	1.05
Madhubani	Dhakjari		2.37	1.86	2.18
Madhubani	Kapasias		1.1	1.05	1.47
Madhubani	Baurahar Chowk		3.5	2.33	3
Madhubani	Harlakhi		2.55	2.21	1.94
Madhubani	Jaynagar		2.12	1.91	2.26
Madhubani	Bideshwar Asthan		4.84	3.44	3.75
Madhubani	Jhanjharpur		0.24	0.6	1.23
Madhubani	Bentadih		2.02	1.22	1.96
Madhubani	Karmauli		Garbage	1.7	2.11
Madhubani	Khajauli		1.05	1.07	1.7
Madhubani	Thantola		2.32	1.98	2.6
Madhubani	Jogiya		Garbage	2.4	2.33
Madhubani	Ambedkar Nagar		2.12	1.16	1.33
Madhubani	Bihari		Garbage	1.21	Garbage
Madhubani	Madhubani		2.73	1.33	1.43
Madhubani	Bhawanipur		5.11	3.6	4.23
Madhubani	Pandaul		Garbage	2.13	3.2
Madhubani	Phulparas I		1.92	1.05	1.22
Madhubani	Shambhwar		3.2	1	2.58
Madhubani	Kapileshwar		1.97	1.83	2.47
Madhubani	Siswar		2.23	2.15	3.2
Madhubani	Karmnali		Could not be located	Could not be located	3.31
Madhubani	Pariharpur		1.07	2.34	2.78
Munger	Bariarpur		0.65	2	4.02
Munger	Singhiyachawk		1.47	2.51	Temp. non-approachable
Munger	Jamalpur I		7.43		7.85
Munger	Gangta Morh		2.77	4.02	Could not be located
Munger	Gobadda		0.81	1.31	1.42
Munger	Tarapur		2.51	3.38	3.59
Munger	Purabsarai		2.35	7.04	5.69
Munger	Rampur2		0.45	1.43	1.66
Munger	Asarganj		1.22	2.85	3.11
Muzaffarpur	Aurai		Temp. non-approachable	0.63	0.01
Muzaffarpur	Rajkhand		Temp. non-approachable	1.95	2.57
Muzaffarpur	Bhagwanpur Chowk	0.8	0.93	1.01	1.3
Muzaffarpur	Jaffarpur	3.14	1.99	2.6	2.88
Muzaffarpur	Mahammadpur Balmi		2.16	2.19	2.88
Muzaffarpur	Bochaha	5.15	Water logged	3.27	3.92

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Muzaffarpur	Shukrahat	4.65	Water logged	2.26	3.18
Muzaffarpur	Barkurwa	3.52	Water logged	2.57	3.04
Muzaffarpur	Surfuddinpur	3.75	Garbage	3.54	3.1 filled
Muzaffarpur	Muzaffarpur		2.1	1.86	2.05
Muzaffarpur	Katra l	3.78	Water logged	3.02	3.4
Muzaffarpur	Ramnagar	3.14	Water logged	1.57	1.94
Muzaffarpur	Sakri chatti		Partially filled	Partially filled	1.03
Muzaffarpur	Wazitpur		Water logged	2.32	2.53
Muzaffarpur	Gargaliya	3.34	Water logged	2.09	2.63
Muzaffarpur	Digra		0.9	1.1	1.53
Muzaffarpur	Japaha	4.19	1.84	2.75	2.98
Muzaffarpur	Dewaria	2.95	1.96	1.83	2.22
Muzaffarpur	Paro	0.93	0.56	1.7	2.17
Muzaffarpur	Daha Chhapra	1.75	1.1	1.84	2.13
Muzaffarpur	Parwalpatti Barauna	0.61	0.49	1.46	1.65
Muzaffarpur	Rajwara	2.65	Water logged	2.63	3.78
Muzaffarpur	Sahebganj		Water logged	2.07	1.5
Muzaffarpur	Dholi		1.1	3.14	3.85
Muzaffarpur	Mahantmanihari		Water logged	1.66	2.26
Muzaffarpur	Seho			1.81	2.19
Nalanda	Asthwan	2.06	0.74	1	1.4
Nalanda	Jangipur	3.05	0.5	0.8	1.27
Nalanda	Sare	6.07	1.6	1.53	2.53
Nalanda	B Sharif Rly Stn	0.3	0.4	0.8	0.82
Nalanda	Biharsharif	3.3	0.4	1.4	1.93
Nalanda	Maghra	3.44	1.3	2.5	2.55
Nalanda	Muraura	1.63	1	1.45	1.49
Nalanda	Ranabigha	5.83	2.2	2.97	4.1
Nalanda	Sohdh		2.4	3.44	3.48
Nalanda	Chandi	5.07	0.77	2.23	3.28
Nalanda	Nagarnausa		Damaged	2.45	Damaged
Nalanda	Ekangarsarai	3.05	1	2.4	2.68
Nalanda	Parwalpur	2.73	3.2	3.4	3.5
Nalanda	Parwalpur 1	2.5	1.75	3.51	3.55
Nalanda	Giriak	4.13	2.78	Could not be located	4.78
Nalanda	Pawapuri	2.19	2.05	2.52	2.69
Nalanda	Harnaut 1	0.7	0.2	1.5	1.5
Nalanda	Hilsa	4.69	0.7	1.25	1.88
Nalanda	Karaiparsurai	2.01	0.9	1.39	1.58
Nalanda	Nischalganj		0.8	1.2	2.15
Nalanda	Ankuri Bazar	6.1	4.1	4.4	6.34
Nalanda	Islampur	1.58	1.4	1.62	1.72
Nalanda	Sherpur	2.07	1.75	1.45	1.85
Nalanda	Daudpur	5.6	2.65	1.6	2.66
Nalanda	Doiya	3.1	1.52	1.35	2.62
Nalanda	Hegampur		2.4	2.27	3.04
Nalanda	Paparnhosa	2.74	1.54	1.7	2.23
Nalanda	Vena	6.21	2.68	3.06	4.46
Nalanda	Bhui	2.31	6.9	4.35	6.14
Nalanda	Kundalpur	5.2	2.7	2.85	3.5
Nalanda	Nalanda	7.5	7.3	6.27	6.3
Nalanda	Nirpur		2.9	0.7	1.28

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Nalanda	Pilkhi	1.17	0.1	0.3	0.6
Nalanda	Rajgir	6.88	4.1	3.71	4.3
Nalanda	Silao	5	2.5	1.1	2.66
Nalanda	Sithaura	0.64	0.96	1.2	1.6
Nalanda	Sarmera	5.85	2.35	1.78	2.8
Nawada	Tungi	3.6	9.32	4.56	4.7
Nawada	Bishunpur		1.69	2.59	2.75
Nawada	Hisua	5.1	3.85	3.99	4.87
Nawada	Roh1	3.8	Flooded	1.8	2.4
Nawada	Kawakol ashram	11	4.9	3.65	4.07
Nawada	Rupau	6.82	1.6	1.49	1.91
Nawada	Khanwa	3.46	2.4	2.68	3.07
Nawada	Garhpar	6.11	3.41	2.77	3.6
Nawada	Gonama	5.64	2.3	Could not be located	3.53
Nawada	Nawada2	9.1	7	5.22	6.26
Nawada	Pakribrawan Pond	6.85	6.3	4.21	4.03
Nawada	Dopata		2.87	Could not be located	2.97
Nawada	Meskaur	1.59	1.04	1.85	2.44
Nawada	Nawabganj	2.72	0.79	1.39	1.42
Nawada	Shahpur Morh	2.59	1	1.99	1.97
Nawada	Warshaliganj	2.46	0.54	Garbage	0.63
W Champaran	Bagaha		1.1	2.7	3.3
W Champaran	Belwa		Water logged	2.25	2.88
W Champaran	Mangalpur		Water logged	2.7	3.3
W Champaran	Chanpatia		0.36	3.65	4.18
W Champaran	Gurwalia		Water logged	2.3	Damaged
W Champaran	Banspur pipra	2.84	Water logged	Damaged	Damaged
W Champaran	Lauria		1.04	2.85	3.01
W Champaran	Shishwania		1.1	2.9	2.95
W Champaran	Korigawa Chowk		0.5	1.5	0.99
W Champaran	Sabuni Pokhra		Garbage	Garbage	3.7
W Champaran	Taulaha		1.46	1.5	2.84
W Champaran	Harnatanr		Temp. non-approachable	Garbage	3.38
W Champaran	Naurangia		Temp. non-approachable	2.8	3.55
W Champaran	Valmikinagar		Temp. non-approachable	2.55	2.65
Patna	Bakhtiarapur	2.89	2.89	4.35	6.17
Patna	Agwanpur			2.42	3.36
Patna	Barh1		0.2	0.92	3.7
Patna	Rajpura			4.1	1.35
Patna	Shahri			0.83	Could not be located
Patna	Amhara	1.17	0.67	1.07	1.57
Patna	Bishambharpur		0.4	0.65	1.1
Patna	Gyaspur Purvatola		0.75	1.25	1.75
Patna	Raghopur		4.25	1.6	3.25
Patna	Bharatpura	0.61	0.83	1.05	0.9
Patna	Dina Bigha_nhs	5.45	0.65	1.65	3.05
Patna	Dulhin Bazar		3.5	Partially filled	Partially filled
Patna	Mariyawa	3.3	1.4	1.7	3.23
Patna	Noniatola	4.98	1.54	2.09	3.44
Patna	GoptalNHS	1.41	0.5	0.65	1.4
Patna	Khaspur	6.17	2.62	3.25	5.32

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Patna	Daniyawan	1.68	0.14	Garbage	1.07
Patna	Fatuha	5.99	1.05	3.29	6.3
Patna	Mokama	0.43	0.43	0.6	Partially filled
Patna	Darbeshpur NHS	6.04	1.55	2.62	6.35
Patna	Gyaspur	0.73	0.75	1.25	1.75
Patna	Lalbegam	4.22	2.05	3.6	4.15
Patna	Maner	1.38	0.75	2.3	4.25
Patna	Nagwa_nhs	Partially filled	Partially filled	Partially filled	Partially filled
Patna	Maranchi		1.26	1.08	6.95
Patna	Faridpur_nhs	3.12	1.3	1.55	Could not be located
Patna	Snehitola	3.96	1.26	1.76	2.56
Patna	Bali Pakar	1.21	0.98	1.53	Could not be located
Patna	Khazpura_nhs	7.8	4.35	5.4	7.99
Patna	Mithapur NHS	0.68	0.72	0.12	0.62
Patna	Patna-City	2.46	1.12	2.12	2.67
Patna	Bishambharpur NHS	2.2	0.4	0.65	1.1
Patna	Etwarpur	1.1	0.9	0.4	2.5
Patna	Hulas Chak	3.5	2	1.23	3.1
Patna	Parsa Bazar_nhs	0.02	0.3	0.67	0.28
Patna	Deokali	5.54	1.97	3.45	Could not be located
Patna	Nima Halt	5.61	3.2	3.4	4.17
E Champaran	Shyampur		Water logged	5.02	4.81
E Champaran	Dumaria		Water logged	2.98	3.41
E Champaran	Radia		Water logged	1.17	1.2
E Champaran	Chakial	0.64	0.32	1.05	1.17
E Champaran	Uttari Gavandra		Water logged	1.58	Could not be located
E Champaran	Belai		Water logged	1.1	0.86
E Champaran	Chatia		Water logged	3.33	4.07
E Champaran	Chiraiya		Water logged		1.71
E Champaran	Mohabbatpur		Water logged	Partially filled	1.72
E Champaran	Bhakatiy Tola		Water logged	3.23	3.01
E Champaran	Ghorashan		Water logged	1.75	2.05
E Champaran	Murarpur		Water logged	1.92	2.79
E Champaran	Sheoraha		Water logged	Partially Filled	Partially Filled
E Champaran	Dharampur		Water logged	2.49	1.83
E Champaran	Dipau		0.75	2.49	0.67
E Champaran	Rajpur	1.24	Water logged	3.31	0.45
E Champaran	Dubey Tola		Water logged	1.59	1.97
E Champaran	Husaini		1.36	2.14	2.6
E Champaran	Kizerpura		Water logged	2.2	3.05
E Champaran	Lala Chapra	2.83	Water logged	1.57	1.79
E Champaran	Rampur Kajuria		Water logged	2.32	2.75
E Champaran	Lakhwara		Water logged	1.46	1.23
E Champaran	Motihari		1.31	Damaged	Damaged
E Champaran	Chhauradanu		Water logged	2.49	2.88
E Champaran	Bishunpur		Water logged	1.23	1.67
E Champaran	Gobindganj		Water logged	0.71	1.3
E Champaran	Patahi		Water logged	2.2	2.96
E Champaran	Raghunathpur		Water logged	2.26	1.53
E Champaran	Raxaul		Water logged	3.68	3.36
E Champaran	Chhapwa		Water logged	Dry	4.05
E Champaran	Bairiya Bazar		Water logged	3.23	3.55
E Champaran	Nawadal		Water logged	1.86	2.64

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Purnia	Amour		2.45	2.83	4.85
Purnia	Baisi2		2.24	3.51	3.4
Purnia	Chadia			2.95	Damaged
Purnia	Budhia Gola		1.78	3.09	3.65
Purnia	Mangujan		2.68	3.34	4.29
Purnia	Dargaha		3.09	2.65	3.35
Purnia	Amri Kukran E		3.18	3.63	4.24
Purnia	Amri Kukran W		Could not be located	3.75	4.38
Purnia	Banmankhi		1.69	2.35	3.29
Purnia	Dhamdaha		Could not be located	3.52	4.85
Purnia	Kajha		3.65	3.11	2.98
Purnia	Jalalgarh		2.25	2.4	3.86
Purnia	Kasba		4.49	4.58	4.92
Purnia	Khata Hat		1.56	2.72	3.09
Purnia	Barsoni		2.48	3.31	3.73
Purnia	Purnia		2.81	2.15	3
Purnia	Ranipatra		2.48	2.85	3.95
Purnia	Tikapatti Chowk		2.28	3.2	3.83
Rohta	Bikramganj pp		3.41	4.51	5.27
Rohta	Chenari hospita		2	5.11	5.35
Rohta	Maliabagh		2.35	5	5.51
Rohta	Anikut		10.1	Damaged	Damaged
Rohta	Karbindia		3.87	3.57	4.26
Rohta	Dinara l		1.68	4.85	5.35
Rohta	Kochas		1.43	4.12	5.27
Rohta	Nokha in temple		1.32	2.57	3.3
Rohta	Bahaura		1.33	4.32	4.45
Rohta	Ambwalia		Garbage	0.65	0.8
Rohta	Belthari		1.5	3.2	4.28
Rohta	Sirisiyan		1.8	2.03	4.8
Rohta	Jahanabad		6.87	4.45	4.62
Rohta	Rajandih		1	1.97	2.45
Rohta	Nasriganj		3.65	Dry	3.89
Rohta	Auraiya		3.84	7.69	8.78
Rohta	Akbarpur in bdo		8.33	8.96	9.84
Rohta	Sasaram p.o.		Garbage	4.32	4.82
Rohta	Tilothu bustand		7.3	Dry	4.82
Rohta	Amawan		0.35	2.46	3.03
Saharsa	Bangaon		1.4	1.2	3
Saharsa	Basudeva		0.69	1.06	3.86
Saharsa	Chainpur		1.48	1.41	4.55
Saharsa	Kharakuti		3.11	2.4	3.95
Saharsa	Niralatola		Could not be located	2.17	4.1
Saharsa	Panchgachhi		1.87	1.9	3.1
Saharsa	Patodi Bazar		2.1	2.23	1.9
Saharsa	Patodibazar		Temp. non-approachable	2.08	1.93
Saharsa	Potwaha		1.9	1.52	1.17
Saharsa	Saharsa l		2.47	2.23	2.4
Saharsa	Tulsiyahi		1.2	1.57	2.8
Saharsa	Sonbarsaraj l		Temp. non-approachable	3.15	3.94
Saharsa	Jamunia		2.68	1.9	2.75

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Saharsa	Semribaktiarpur		Temp. non-approachable	1.95	1.55
Saharsa	Simri Bakhtiyarpur		3.87	2.38	1.45
Saharsa	Adrahch		1.89	2.2	2.51
Saharsa	Baidnathpur		2.09	2.24	Temp. non-approachable
Saharsa	Chandaur Purbi		2.34	1.49	1.69
Samastipur	Kalyanpur	2.29	2.04	0.71	1.46
Samastipur	Patapara	4.4	Water logged	0.27	0.75
Samastipur	Singhia Ghat		2.09	2.57	3.8
Samastipur	Dalsinghsarai	1.33	Could not be located	1.62	4.34
Samastipur	Malipur	3.14	2.40	1.26	2
Samastipur	Basudebpur	1.85	2.2	1.01	2.22
Samastipur	Jakhra		2.29	2.28	2.81
Samastipur	Kishanpur2	4.21	Garbage	2.4	3
Samastipur	Madudabad	4.5	2.66	2.46	3.45
Samastipur	Bajidpur	2.51	0.95	1.74	2.87
Samastipur	Kerian		6.27	4.46	4.98
Samastipur	Rosera	5.23	3.32	4.18	5.47
Samastipur	Harpur Aloth		New well	New well	2.91
Samastipur	Sarai Ranjan	3.82	2.18	2.96	1.63
Samastipur	Motipur	5.5	1.85	2.17	2.67
Samastipur	Tajpur I	4.13	Garbage	1.95	2.39
Samastipur	Vikrampur		1.37	1.19	2.9
Samastipur	Dandia Asadpur	4.09	Could not be located	1.86	2.39
Samastipur	Raipur		New well	New well	3.38
Samastipur	Ujiarpur	1.5	1.95	1.54	2.68
Samastipur	Jathmalpur	3.79	Could not be located	4.32	4.67
Samastipur	Kuseya		New well	New well	3.17
Samastipur	Raghunathpur		2.12	2.49	3.28
Saran	Manopali	2.45	Well could not be located	Well could not be located	2.74
Saran	Chhapra	1.26	1.53	1.85	Damaged
Saran	Chirand	3.39	Well could not be located	1.97	3.22
Saran	Daldali Bazar A		0.64	1.59	3.22
Saran	Nagra	2.13	0.7	3.02	1.7
Saran	Taraiya		Water logged	0.82	2.2
Saran	Ammi	3.78	1.73	5.04	2.6
Saran	Bishunpur	1.31	Well could not be located	Well could not be located	2.65
Saran	Ekma	1.83	0.8	1.06	1.85
Saran	Garkha	4.22	Well could not be located	4.57	4.9
Saran	Minapur	0.73	1.39	2.5	1.85
Saran	Bisunpur		1.03	2.67	3.29
Saran	Rampur Kala		Well could not be located	0.04	1.56
Saran	Breja		Well could not be located	Well could not be located	2.82
Saran	Madansath		Well could not be located	Well could not be located	2.92
Saran	Majhanpura		0.31	Well could not be located	5.35
Saran	Manjhi		1.55	1.47	2.28
Saran	Marhaura	1.88	Temp. non-approachable	1.25	2.25
Saran	Masrakh		Temp. non-approachable	0.99	1.9
Saran	Saguni		Temp. non-	1.88	3.53

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
			approachable		
Saran	Baleshara	0.2	Temp. non-approachable	Well could not be located	2.5
Saran	Sanghar Tola		0.88	Well could not be located	3.56
Saran	Chausia			Well could not be located	3.98
Saran	Nayagaon		0.23	1.75	3.4
Saran	Sonepur I		0.4	Well could not be located	1.56
Sheikhpura	Ambari	3.47	2.35	2.15	1.7
Sheikhpura	Barbiga	5.93	2.17	2.81	3.35
Sheikhpura	Keoti I	2.98	0.24	0.6	0.77
Sheikhpura	Koeri Bigha	2.68	0.85	1.33	1.48
Sheikhpura	Sherpar		2.22	2.64	3.47
Sheikhpura	Nemdarganj	1.54	1	1.46	1.55
Sheikhpura	Seikhpura		1.11	1.88	2.72
Sheohar	Belsand		1.18	2.27	2.67
Sheohar	Sarbarpur		1.88	1.45	2.35
Sheohar	Purnhaiya Bazar		Garbage	2.86	3.5
Sheohar	Sasaula Khurd		Garbage	2.61	2.6
Sitamarhi	Dheng		2.09	1.84	2.35
Sitamarhi	Bangaon		3.72	1.58	2.3
Sitamarhi	Jagwanabazar		1.07	1.62	2.03
Sitamarhi	Bhpbhana Khaptola	2.1	3.21	1.83	2.31
Sitamarhi	Kodwara Tola	0.94	2.15	1.04	1.32
Sitamarhi	Panaura	1.11	3.05	1.24	1.3
Sitamarhi	Sitamarhi	2.1	2.65	2.35	2.49
Sitamarhi	Sursand	1.46	3.25	2.51	2.2
Sitamarhi	Nanpur		2.92	1.37	Temp. non-approachable
Sitamarhi	Khairwa		2.48	1.47	2.5
Sitamarhi	Pupri		3.84	1.87	2.12
Sitamarhi	Karahniya Chowk		3.38	1.5	1.55
Sitamarhi	Kushmari		2.07	1.82	2.25
Sitamarhi	Thumba	1.07	1.92	1.14	1.52
Sitamarhi	Bhutahi		1.98	0.75	0.86
Sitamarhi	Dastiya		3.87	1.76	2
Siwan	Andar		Water logged	5.26	5.71
Siwan	Chimanpur		Temp. non-approachable	1.9	2.52
Siwan	Hardia		Temp. non-approachable	1.81	2.61
Siwan	Malmalia Chowk		Temp. non-approachable	2.18	2.83
Siwan	Sarripatti	1.36	Temp. non-approachable	1.5	2.11
Siwan	Darauli		0.49	4.7	Damaged
Siwan	Tarwara	2.35		0.9	Damaged
Siwan	Chitakhil		1.28	2.25	3
Siwan	Deoria		0.49	3.15	3.3
Siwan	Maharajganj		1.28	0.78	2.24
Siwan	Patrehi		Water logged	1.6	2.4
Siwan	Guthani More		0.85	Could not be located	2.65
Siwan	Sadikpur		1.2	1.6	2.25
Siwan	Jamanpura		Water logged	1.42	Damaged
Siwan	Muraripatti	2.07	0.79	1.88	2.72
Siwan	Bhagar		1.49	2.7	3.94
Supaul	Balua		1.15	Blocked	2.55

District	Location	May 2021	Aug. 2021	Nov. 2021	Jan. 2022
Supaul	Bhawanipur I		1.99	2.27	1.39
Supaul	Bhimnagar		0.2	1.4	1.48
Supaul	Birpur		1.12	2.26	2.55
Supaul	Ratanpura I		1.8	1.97	1.4
Supaul	Balua I		1.89	2.7	1.9
Supaul	Balua Bazar		1.56	1.93	3.15
Supaul	Bhasanpatti		0.91	1.14	2.80
Supaul	Andauli		1.09	1.3	4.1
Supaul	Hardi		Could not be located	2.59	3.18
Supaul	Kario		2.62	2.39	3.73
Supaul	Malhani		1.93	2.42	2.97
Supaul	Malhani New		1.87	1.77	1.52
Supaul	Supaul		2.43	2.1	1.35
Supaul	Thumba		2.32	2.99	2.19
Supaul	Pipra chowk		3.69	2.58	5.1
Supaul	Shyam Nagar		2.1	2.97	1.45
Supaul	Ganpatganj I		1.37	Blocked	2.48
Supaul	Kaithola		2.68	3.08	2.6
Supaul	Karjain		1.12	Dry	2.4
Supaul	Norha		1.97	2.1	1
Supaul	Parsarma		1.89	2.12	3.45
Supaul	Pratapganj		2.13	2.5	2.85
Supaul	Jadia		Could not be located	2.27	2.4
Supaul	Tribeniganj		2.75	3	1.44
Vaishali	Chak Sikandar		0.22	4.02	3.82
Vaishali	Kachanpur	3.41	1.62	4.18	4.12
Vaishali	Mathura		0.94	2.3	3.73
Vaishali	Baksama	2.28	0.9	1.75	2.05
Vaishali	Bhaluhia		0.92	1.05	1.37
Vaishali	Chandpur Kala	2.11	0.45	1.61	1.7
Vaishali	Garaul	0.74	0.4	0.86	1.21
Vaishali	Garaul Rly Stn		0.53	Could not be located	1.87
Vaishali	Harpur	3.78	0.57	Could not be located	1.75
Vaishali	Nonepur	1.9	0.8	1.5	2.7
Vaishali	Hajipur	5.75	1.85	5.6	5.44
Vaishali	Sahjadpur	4.19	0.61	3.26	4.36
Vaishali	Silautha Bisnupur		1.88	1.65	2.98
Vaishali	Namidh	1.91	0.23	1.3	1.93
Vaishali	Chakiyai	2.68	0.23	1.2	1.61
Vaishali	Kumharkal	3.71	1.05	2.37	2.2
Vaishali	Mahnar	4.77	1.13	2.8	2.78
Vaishali	Mahua I	2.46	1.43	3.5	3.12
Vaishali	Tariya Supaul	1.77	1.2	3.14	2.42
Vaishali	Mushari tola	3.78	Water logged	3.28	3.05
Vaishali	Sahdei Bujurg	3.21	0.23	3.35	2.84
Vaishali	Chintawanpur	2.66	0.6	1.55	2.43
Vaishali	Thukaiya		Could not be located	2.35	1.84
Vaishali	Vaishali High School	1.02	Could not be located	2.62	1.81

**During May 2021 limited areas have been covered by NHS monitoring due to Covid-19 pandemic.*

Piezometric Head in m bgl

SN	District	Location	May_21	Aug_21	Nov_21	Jan_22
1	Aurangabad	Deo EW	3.25	4.48	Cap Jam	5.8
2	Katihar	Balrampur		3.28	3.95	4.75
3	Patna	Bikram	6.9	2.6	3	4.7
4	Patna	Khagaul EW1	9.08	5.1	5.4	7.2
5	Patna	Maner EW		Tape struck	5.25	Tape struck
6	Patna	Naubatpur	10	5.65	4.7	Cap jam
7	Patna	A N College_EW	6.74	10.65	5.38	5.75
8	Patna	Gandhi Maidan	12.7	9	9.05	2.6
9	Patna	Kankarbagh	11.4	7.6	8.5	11.3
10	Patna	Kumhrar	11.45	7.2	8.2	Tape struck
11	Patna	Anisabad	10.08	6.34	Pz Room locked	8.5
12	Patna	Phulwari Thana	9.87	6.27	6.89	9.17
13	Patna	Karma		5.65	Cap Jam	4.46

Major Chemical Parameters of Ground Water Samples of HNS Collected During in Bihar State

SN	District	Block	Location	pH	EC ($\mu\text{S}/\text{cm}$ 25°C)	TDS	TH as (CaCO_3)	Ca^{2+}	Mg^{2+}	Na^+	K^+	CO_3^{2-}	HCO_3^{2-}	Cl^-	SO_4^{2-}	NO_3^-	F^-	PO_4^{3-}	SiO_2
1	Saran	Dighwara	Aami	8.01	372	241.8	115	38	4.86	27	11.2	0	128.1	21.3	30	25	0.26	0	0
2	Saran	Baniapur	Baleshra	8.08	1176	764.4	290	96	12.15	131	4.3	0	292.8	127.8	82	90	0.53	0	0
3	Saran	Ekma	Bishunpur	8.2	650	422.5	170	50	10.94	65	12.8	0	170.8	53.25	53	65	0.38	0	0
4	Saran	Chapra	Chapra	8.19	476	309.4	150	54	3.65	34	12	0	146.4	46.15	4.93	58	0.29	0.09	0
5	Saran	Chapra	Chirand	8.18	642	417.3	190	66	6.08	52	15	0	195.2	81.65	23	30	0.71	0	0
6	Saran	Ekma	Ekma	8.2	461	299.65	120	28	12.15	46	6.95	0	128.1	67.45	14	12	0.53	0	0
7	Saran	Garkha	Garkha	8.19	398	258.7	110	30	8.51	35	7.25	0	115.9	42.6	11	33	0.34	0	0
8	Saran	Baniapur	Manopali	8.12	929	603.85	285	106	23.09	76	12	0	262.3	106.5	37.13	71.18	0.68	0	0
9	Saran	Marhaura	Marhaura	8.14	617	401.05	200	60	12.15	45	11	0	189.1	35.5	94	10.02	0.41	0.32	0
10	Saran	Garkha	Minapur	7.97	1470	955.5	415	136	18.23	121.71	18.3	0	329.4	191.7	95	75.44	0.38	0	0
11	Saran	Jalalpur	Nagra	8.13	511	332.15	170	50	10.94	32	12	0	244	10.65	11.4	31	0.47	0	0
12	Siwan	Bhagwanpur	Malmalia Chowk	8.14	320	208	130	40	7.29	4.69	13.65	0	91.5	24.85	23	30.57	0.63	0	0
13	Siwan	Bhagwanpurhat	Sarripatti	7.87	1805	1173.25	435	150	14.58	182.64	53.65	0	384.3	230.75	168	105	0.21	0	0
14	Siwan	Barharia	Tarwara	8.13	678	440.7	215	72	8.51	52	6.5	0	231.8	74.55	24.3	20.79	0.75	0	0
15	Vaishali	Goraul	Baksama	8.14	404	262.6	145	54	2.43	25	2.1	0	201.3	14.2	4.23	10.78	0.39	0	0
16	Vaishali	Mahnar	Chakiyai	8.16	999	649.35	325	102	17.01	75	8.4	0	250.1	106.5	101	47.22	0.63	0.42	0
17	Vaishali	Goraul	Chandpur Kala	8.17	607	394.55	205	70	7.29	42	6.3	0	244	53.25	17	12.21	0.21	0	0
18	Vaishali	Patedi Belsar	Chintawanpur	8.19	439	285.35	115	34	7.29	41	9.95	0	176.9	28.4	25.5	10.47	0.13	0	0
19	Vaishali	Garaul	Garaul	8.2	693	450.45	220	66	10.94	51	12	0	158.6	124.25	17.02	26	0.87	0	0
20	Vaishali	Vaishali	Hajipur	8.16	556	361.4	205	70	7.29	30	5.5	0	189.1	28.4	35	51.14	0.61	0	0
21	Vaishali	Goraul	Harpur	8.13	560	364	215	64	13.37	29	4.62	0	207.4	21.3	47	42	0.72	0	0
22	Vaishali	Bidupur	Kachanpur	8.16	426	276.9	140	44	7.29	31	6.25	0	225.7	14.2	4.81	9.54	0	0.09	0
23	Vaishali	Mahnar	Kumharkal	8.07	1089	707.85	360	132	7.29	71.28	9.27	0	378.2	46.15	132	14.2	0	0	0
24	Vaishali	Mahnar	Mahnar	8.15	438	284.7	105	32	6.08	46	10.4	0	115.9	24.85	35	65	0	0	0
25	Vaishali	Mahua	Mahua 1	8.14	855	555.75	245	80	10.94	78	10.2	0	146.4	152.65	41	56.69	0	0	0

SN	District	Block	Location	pH	EC ($\mu\text{S}/\text{cm}$ @ 25°C)	TDS	TH as (CaCO_3)	Ca^{2+}	Mg^{2+}	Na^+	K^+	CO_3^{2-}	HCO_3^{2-}	Cl^-	SO_4^{2-}	NO_3^-	F^-	PO_4^{3-}	SiO_2
26	Vaishali	Bidupur	Mathura	8.12	517	336.05	155	38	14.58	44	6.25	0	176.9	10.65	31	82	0	0	0
27	Vaishali	Patepur	Mushari Tola	8.13	834	542.1	285	108	3.65	58	3.1	0	250.1	49.7	58	97	0	0	0
28	Vaishali	Lalganj	Namidh	8.15	850	552.5	300	110	6.08	53	9.78	0	311.1	71	34.17	44	0	0	0
29	Vaishali	Bhagwanpur	Nonepur	8.14	769	499.85	275	96	8.51	47	5.4	0	274.5	28.4	58	75	0	0	0
30	Vaishali	Sahdei Bujurg	Sahdei Bujurg	8.02	1245	809.25	395	134	14.58	98.49	8.2	0	329.4	74.55	179.5	75	0	0	0
31	Vaishali	Hajipur	Sahjadpur	8.16	565	367.25	200	54	15.8	34	7.52	0	268.4	17.75	5.49	43	0	0	0
32	Vaishali	Mahua	Tariya Supaul	8.19	508	330.2	210	70	8.51	12	11.2	0	140.3	42.6	20.52	67.39	0	0	0
33	Vaishali	Vaishali	Thukaiya	8.12	452	293.8	150	46	8.51	28	10.55	0	158.6	10.65	40	50	0	0	0
34	Vaishali	Vaishali	Vaishali	8.16	661	429.65	210	70	8.51	53	5.7	0	189.1	28.4	82	68	0	0	0
35	Muzaffarpur	Sahebganj	Daha Chapra	8.14	567	368.55	200	72	4.86	34	8.1	0	231.8	10.65	17.62	72	0	0	0
36	Muzaffarpur	Paroo	Dewaria	8.19	798	518.7	340	102	20.66	23	5.7	0	189.1	152.65	17.24	10.38	0	0	0
37	Muzaffarpur	Paroo	Jaffarpur	8.16	384	249.6	125	36	8.51	26	6.85	0	176.9	24.85	2.85	9.45	0	0	0
38	Muzaffarpur	Baruraj	Muhammadpur Balmi	8.14	459	298.35	135	36	10.94	35	13.4	0	146.4	17.75	36	58	0	0	0
39	Muzaffarpur	Paroo	Paroo	7.87	1870	1215.5	540	184	19.44	165	30	0	463.6	220.1	188	59	0	0	0
40	Muzaffarpur	Sahebganj	Parwal Patti Baraun	7.89	1381	897.65	465	158	17.01	95	16	0	500.2	159.75	24.56	43	0	0	0
41	Muzaffarpur	Sahebganj	Rajwara	8.14	630	409.5	220	68	12.15	39	6.65	0	292.8	10.65	46.08	9.48	0	0.12	0
42	E. Champaran	Chakia	Chakia 1	8.12	561	364.65	185	60	8.51	40	5.8	0	189.1	21.3	29	80	0.74	0	0
43	E. Champaran	Kesaria	Lala Chapra	8.13	535	347.75	135	42	7.29	50	18.25	0	140.3	39.05	36	75	0.63	0	0
44	E. Champaran	Kalyanpur	Rajpur	8.16	558	362.7	150	32	17.01	59	17	0	128.1	110.05	27.41	10.15	0.42	0	0
45	Patna	Danapur	Gobhtal	8.08	914	594.1	325	90	24.3	50.63	13.52	0	329.4	71	41.02	39.63	0.19	0	0
46	Patna	Danapur	Khaspur	8.19	356	231.4	125	40	6.08	19.65	1.95	0	176.9	14.2	6.66	2.82	0.19	0	0
47	Patna	Danapur	Darbespur	8.18	434	282.1	175	56	8.51	15.74	2.95	0	231.8	7.1	3.72	1.46	0.61	0	0
48	Patna	Maner	Lalbegum	8.13	444	288.6	175	60	6.08	17.32	1.93	0	213.5	21.3	9.75	5.24	0.24	0	0
49	Patna	Maner	Gyaspur	7.89	1333	866.45	330	86	27.95	134.25	24	0	378.2	181.05	75.58	23.42	0.24	0	0
50	Patna	Maner	Nagwa	8.17	318	206.7	130	46	3.65	9.82	2.01	0	152.5	14.2	9.75	1.03	0.24	0	0
51	Patna	Bhita	Bishambharpur	8.14	310	201.5	135	32	13.37	6.22	1.94	0	134.2	17.75	8.19	0.94	0.36	0	0
52	Patna	Bihta	Amhara	8.14	349	226.85	140	48	4.86	12.42	1.76	0	158.6	17.75	8.54	1.04	0	0	0
53	Patna	Bikram	Mariyawa	8.16	256	166.4	95	32	3.65	12.21	1.46	0	103.7	14.2	5.19	19.9	0	0	0

SN	District	Block	Location	pH	EC ($\mu\text{S}/\text{cm}$ @ 25°C)	TDS	TH as (CaCO_3)	Ca^{2+}	Mg^{2+}	Na^+	K^+	CO_3^{2-}	HCO_3^{2-}	Cl^-	SO_4^{2-}	NO_3^-	F^-	PO_4^{3-}	SiO_2
54	Patna	Bikram	Din Bigha	8.13	425	276.25	170	56	7.29	14.05	1.18	0	225.7	10.65	2.29	6.89	0.21	0	0
55	Patna	Patna Sadar	Patna-City	8.1	1054	685.1	305	54	41.31	75.63	36.31	0	317.2	120.7	54.13	45.63	0.45	0	0
56	Patna	Fatwa	Fatuha	8.16	507	329.55	170	62	3.65	35.21	2.21	0	189.1	42.6	19.66	20.22	0	0	0
57	Patna	Bakhtiarapur	Bakhtiarapur	8.11	677	440.05	250	24	46.17	33.67	4.63	0	305	46.15	15.46	2.22	0	0	0
58	Patna	Mokama	Mokama	8.17	373	242.45	120	40	4.86	24.13	3.51	0	128.1	28.4	34.13	1.12	0.34	0	0
59	Patna	Naubatpur	Snehitola	8.06	808	525.2	270	68	24.3	55.38	6.77	0	201.3	95.85	51.7	59.51	0	0	0
60	Patna	Mokama	Maranchi	8.01	673	437.45	200	56	14.58	58.46	3.08	0	231.8	60.35	41.26	9.07	0	0	0
61	Patna	Maner	Maner	7.99	687	446.55	270	44	38.88	31.36	2.32	0	176.9	95.85	32.61	27.93	0.09	0	0
62	Patna	Naubatpur	Faridpur	8.05	430	279.5	175	44	15.8	16.29	2.01	0	158.3	53	2.29	1.97	0.16	0	0
63	Patna	Bikram	Noniatola	7.91	954	620.1	340	62	44.96	55.69	5.63	0	317.2	95.85	41.26	39.95	0.31	0	0
64	Patna	Dulhin Bazar	Dulhin Bazar	8.04	689	447.85	260	24	48.6	33.84	7.12	0	219.6	71	31.62	27.71	0.06	0	0
65	Patna	Paliganj	Bharatpura	8.14	719	467.35	195	66	7.29	68.41	6.95	0	323.3	42.6	11.33	19.59	0.81	0	0
66	Patna	Bhita	Bali Pakar	8.11	1524	990.6	500	102	59.54	89.66	45.93	0	506.3	142	75.58	58.93	1.28	2.08	0
67	Patna	Punpun	Deokali	8.16	375	243.75	150	32	17.01	14.63	1.99	0	164.7	21.3	11.23	3.06	0	0	0
68	Patna	Dhanrua	Nima halt	8.17	423	274.95	160	22	25.52	18.22	1.6	0	201.3	21.3	8.19	4.32	0.43	0	0
69	Patna	Patna Sadar	Mithapur	8.09	690	448.5	270	34	44.96	29.84	2.76	0	231.8	92.3	18.57	4.28	0	0	0
70	Patna	Bikram	Andhra Chowki	8.16	355	230.75	155	54	4.86	7.36	1.4	0	164.7	21.3	6.66	3.1	0.48	0	0
71	Patna	Phulwari Sharif	Hulas Chak	8.04	1102	716.3	300	14	64.39	110.28	6.5	0	402.6	117.15	41.23	6.94	0	0	0
72	Patna	Phulwari Sharif	Etwarpur	8.16	536	348.4	210	34	30.38	22.31	3.02	0	164.7	53.25	21.25	29.46	0.18	0	0
73	Patna	Phulwari Sharif	Parsa Bazar	8.15	429	278.85	170	44	14.58	15.98	2.3	0	140.3	46.15	19.89	3.6	0.23	0	0
74	Patna	Patna Sadar	Khazpura	8.07	718	466.7	260	68	21.87	41.1	2.56	0	164.7	71	71.28	58.5	0.23	0	0
75	Patna	Maner	Simri	8.01	481	312.65	190	22	32.81	17.52	1.36	0	128.1	63.9	21.73	21.33	0.1	0	0
76	Patna	Bikram	Bikram	8.03	307	199.55	120	36	7.29	11.23	1.09	0	79.3	24.85	36.26	16.4	0.14	0	0
77	Patna	Patna rural	Kankarbagh	8.03	694	451.1	285	42	43.74	24.02	2.59	0	164.7	120.7	23.31	4.08	0.77	0	0
78	Patna	Patna rural	Kumhrar	8.14	364	236.6	140	34	13.37	14.77	2.91	0	140.3	31.95	16.87	1.76	0.31	0	0
79	Patna	Patna rural	Gandhi maidan	8.04	308	200.2	115	34	15.12	14.63	1.95	0	152.5	10.65	5.17	1.13	0.31	0	0
80	Patna	Patna rural	B N College	8.09	384	249.6	140	38	10.94	21.03	2.41	0	201.3	10.65	3.72	0.8	0	0	0
81	Patna	Patna rural	A N College	7.98	295	191.75	110	22	13.37	14.31	1.15	0	134.2	17.75	8.98	1.05	0	0	0

SN	District	Block	Location	pH	EC ($\mu\text{S}@$ 25°C)	TDS	TH as (CaCO ₃)	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	CO ₃ ⁻	HCO ₃ ²⁻	Cl ⁻	SO ₄ ²⁻	NO ₃ ⁻	F ⁻	PO ₄ ³⁻	SiO ₂
82	Patna	Danapur cum Khagaul	Khagaul1	8.07	519	337.35	205	28	32.81	20.12	6.12	0	189.1	46.15	25.58	7.09	0.11	0	0
83	Patna	Phulwari Sharif	Phulwari	8.11	409	265.85	160	26	23.09	17.62	1.56	0	152.5	21.3	36.26	4.22	0.48	0	0
84	Patna	Patna rural	B V College	8.1	512	332.8	195	22	34.02	21.36	2.16	0	122	60.35	54.22	5.08	1.7	0	0
85	Patna	Naubatpur	Naubatpur	8.08	336	218.4	130	32	12.15	14.03	3.68	0	134.2	24.85	14.36	1.29	0	0	0
86	Patna	Patna Sadar	Kurji	8.04	374	243.1	145	28	18.23	15.13	2.31	0	164.7	14.2	18.85	1.69	0.63	0	0
87	Patna	Bhita HQ	Bhita	8.07	845	549.25	320	16	68.04	41.36	4.83	0	219.6	92.3	65.21	35.36	0.48	0	0
88	Patna	Bhita	Arap	8.06	400	260	135	30	14.58	25.07	1.05	0	170.8	24.85	17.36	4.09	0.44	0	0
89	Arwal	Arwal	Dirpal Bigha	7.99	261	169.65	110	32	7.29	8.34	0.98	0	91.5	10.65	25.31	11.71	0.16	0	0
90	Arwal	Arwal	Arwal 1	8.07	283	183.95	85	24	6.08	21.03	0.82	0	85.4	24.85	15.85	17.86	0.23	0	0
91	Arwal	Karpi	Bairbigha	8.04	1184	769.6	260	24	48.6	142.36	12.36	0	347.7	142	61.32	38.64	0.08	0	0
92	Arwal	Arwal	Imamganj	7.98	684	444.6	280	30	49.82	25.13	1.4	0	158.6	113.6	21.36	25.31	0.62	0	0
93	Arwal	Ratni Faridpur	Jhunathi	8.04	411	267.15	160	54	6.08	17.23	1.84	0	164.7	28.4	25.31	3.19	0.24	0	0
94	Arwal	Kurtha	Kurtha bdo	8.09	836	543.4	345	60	47.39	26.12	4.63	0	280.6	110.05	20.41	6.15	0.44	0	0
95	Jehanabad	Modanganj	Kako	8.02	1579	1026.35	420	58	66.83	126.84	65.32	0	597.8	131.35	71.63	42.36	0.6	0	0
96	Jehanabad	Ghoshi	Ghoshi	8.13	532	345.8	225	50	24.3	15.67	0.92	0	195.2	39.05	21.63	22.36	0.6	0	0
97	Jehanabad	Hulasgunj	Hulasganj	7.98	787	511.55	290	38	47.39	41.36	2.12	0	219.6	110.05	35.87	21.51	0.49	0	0
98	Jehanabad	Makhdumpur	Alubikha	8.06	833	541.45	300	40	48.6	49.32	3.02	0	292.8	99.4	16.31	11.63	0.57	0.93	0
99	Jehanabad	Jehanabad	Gaurakhini	8.03	1049	681.85	375	20	78.97	63.2	2.61	0	305	131.35	71.61	13.33	0.45	0	0
100	Jehanabad	Jehanabad	Jahanabad hosp.	8.16	1300	845	465	30	94.77	74.52	11.3	0	353.8	191.7	38.63	57.64	0.28	0	0
101	Gaya	Konch	Konch	8.1	381	247.65	150	46	8.51	14.63	1.77	0	152.5	24.85	11.56	19.34	0.21	0	0
102	Gaya	Tekari	Tekari	8.17	946	614.9	355	60	49.82	48.47	6.92	0	152.5	181.05	35.63	53.52	0.29	0	0
103	Aurangabad	Aurangabad	Aurangabad	8.05	1388	902.2	495	54	87.48	75.31	12.63	0	335.5	230.75	30.36	59.22	0.39	0	0
104	Aurangabad	Daudnagar	Daudnagar	8.11	1133	736.45	425	30	85.05	51.36	18.34	0	280.6	202.35	21.98	31.05	0.48	0	0
105	Aurangabad	Obra	Obra	8.13	360	234	135	38	9.72	15.36	1.3	0	73.2	42.6	22.01	39.29	0.39	0	0
106	Aurangabad	Barun	Barun	8.1	511	332.15	210	26	35.24	19.3	1.63	0	140.3	39.05	49.28	27.86	0.39	0	0
107	Aurangabad	Deo	Deo1	7.91	1013	658.45	355	24	71.69	62.36	9.63	0	396.5	60.35	55.23	36.91	0.84	0	0
108	Aurangabad	Goh	Dhobi Tola_Goh	8.16	544	353.6	180	26	27.95	36.25	1.75	0	225.7	28.4	12.97	31.3	1.79	0	0
109	Aurangabad	Aurangabad	Patrava	8.17	276	179.4	100	22	10.94	15.42	2.58	0	67.1	24.85	23.63	22.55	0.42	0	0

SN	District	Block	Location	pH	EC ($\mu\text{S}/\text{cm}$ @ 25°C)	TDS	TH as (CaCO_3)	Ca^{2+}	Mg^{2+}	Na^+	K^+	CO_3^{2-}	HCO_3^{2-}	Cl^-	SO_4^{2-}	NO_3^-	F^-	PO_4^{3-}	SiO_2
110	Aurangabad	Rafiganj	Tineri Morh	8.01	947	615.55	270	26	49.82	85.12	9.85	0	268.4	134.9	42.01	18.56	0.63	0	0
111	Patna	Daniyawar	Daniyawar	7.23	480	312	160	26	23.09	35.3	1.1	0	189.1	46.15	13.9	1.03	0.24	0	15.62
112	Nalanda	Neemchak	Ankuri Bazar	8.01	606	393.9	210	16	41.31	38.12	1.26	0	274.5	46.15	5.64	3.73	0.57	0	14.82
113	Nalanda	Asthawan	Asthawan	7.85	1007	654.55	250	12	53.46	107.45	4.97	0	457.5	60.35	30.23	6.1	0.88	0	17.55
114	Nalanda	Bihar Sharif	Bihar Sharif	7.67	1063	690.95	230	22	42.53	124.02	20.63	0	366	110.05	47.76	21.81	0.33	0	16.59
115	Nalanda	Silao	Bhui	8.01	2670	1735.5	890	14	207.76	168.12	41.23	0	695.4	347.9	233.3	29.06	0.36	0	15.1
116	Nalanda	Bihar Sharif	Bihar Sharif	7.53	1468	954.2	300	18	61.97	170.26	35.03	0	427	188.15	86.43	29.46	0.24	0	16.06
117	Nalanda	Chandi	Chandi	7.46	720	468	205	12	42.53	67.33	2.57	0	372.1	17.75	14.44	1.79	0.81	0	16.5
118	Nalanda	Noorsarai	Daudpur	8.13	615	399.75	215	12	44.96	38.3	4.48	0	298.9	28.4	8.9	13.88	0.28	0	15.78
119	Nalanda	Rahui	Doiya	8.06	638	414.7	140	18	23.09	75.63	4.17	0	262.3	35.5	45.36	3.5	0.17	0	15.28
120	Nalanda	Ekangarsarai	Ekangarsarai	7.95	1357	882.05	280	12	60.75	150.26	49.63	0	585.6	60.35	86.43	27.82	0.96	0	14.72
121	Nalanda	Giriak	Giriak	7.5	760	494	285	20	57.11	38.15	3.9	0	372.1	24.85	22.22	19.88	0.39	0	19.02
122	Nalanda	Harnaut	Harnaut 1	7.35	669	434.85	245	18	48.6	36.65	2.45	0	323.3	31.95	10.74	4.1	0.18	0	15.28
123	Nalanda	Hilsa	Hilsa	7.6	847	550.55	305	16	64.39	50.12	6.8	0	372.1	63.9	15.46	5.6	0.29	0	13.02
124	Nalanda	Islampur	Islampur	7.7	599	389.35	160	18	27.95	58.31	4.93	0	317.2	17.75	10.12	1.84	0.3	0	1.2
125	Nalanda	Asthawan	Jangipur	7.97	472	306.8	160	20	26.73	31.25	2.16	0	183	35.5	17.25	21.36	0.03	0	11.56
126	Nalanda	Hilsa	Karaiparsurai	7.62	494	321.1	165	12	32.81	32.17	3.24	0	225.7	28.4	16.58	1.12	0.1	0	16.45
127	Nalanda	Silao	Kundalpur	7.92	926	601.9	140	20	21.87	140.32	11.32	0	481.9	21.3	20.09	8.27	0.54	0	16.85
128	Nalanda	Bihar Sharif	Maghra	7.53	1267	823.55	350	16	75.33	98.63	47.61	0	414.8	131.35	81.25	29.26	0.21	0	13.02
129	Nalanda	Bihar Sharif	Muraora	7.8	1359	883.35	335	20	69.25	135.48	35.71	0	536.8	106.5	54.2	26.57	0.32	0	14.28
130	Nalanda	Rajgir	Nalanda	7.91	1223	794.95	285	14	60.75	140.23	11.7	0	481.9	60.35	108.91	21.3	0.61	0	14.42
131	Nalanda	Ekangarsarai	Nishchalganj	7.62	817	531.05	195	16	37.67	94.12	1.69	0	396.5	31.95	16.92	24.1	0.28	0	15.05
132	Nalanda	Noorsarai	Papanhosa	7.5	723	469.95	230	18	44.96	55.71	5.36	0	311.1	56.8	13.84	0.93	0.33	0	14.82
133	Nalanda	Ekangarsarai	Parwalpur 1	7.96	1577	1025.05	395	50	65.61	150.3	41.28	0	536.8	181.05	62.9	29.4	1.01	0	13.4
134	Nalanda	Giriak	Pawapuri	7.86	741	481.65	210	20	38.88	67.13	5.55	0	341.6	53.25	10.1	4.61	0.73	0	12.53
135	Nalanda	Rajgir	Pilkhi	7.7	1112	722.8	285	44	42.53	108.7	14.23	0	463.6	92.3	35.21	2.86	0.4	0	12.78
136	Nalanda	Rajgir	Rajgir	7.5	825	536.25	315	20	64.39	36.71	9.51	0	305	78.1	25.28	30.28	0.11	0	17.95
137	Nalanda	Bihar Sharif	Ranabigha	7.41	1639	1065.35	440	14	98.42	150.23	32.31	0	414.8	213	136.1	41.02	0.4	0	13.83

SN	District	Block	Location	pH	EC ($\mu\text{S}@$ 25°C)	TDS	TH as (CaCO_3)	Ca^{2+}	Mg^{2+}	Na^+	K^+	CO_3^-	HCO_3^{2-}	Cl^-	SO_4^{2-}	NO_3^-	F^-	PO_4^{3-}	SiO_2
138	Nalanda	Asthawan	Sare	7.7	777	505.05	295	44	44.96	39	3.7	0	323.3	42.6	48.84	4.62	0.2	0	13.51
139	Nalanda	Sarmera	Sarmera	8.12	486	315.9	180	16	34.02	25.36	2.84	0	250.1	17.75	9.95	1.01	0.24	0	18.45
140	Nalanda	Islampur	Sherpur	8.13	552	358.8	190	8	41.31	36.61	1.51	0	292.8	21.3	4.34	0.84	0.81	0	15.84
141	Nalanda	Silao	Silao	7.9	2420	1573	645	42	131.22	224.18	42.36	0	591.7	351.45	165.29	28.72	0.01	0	16.14
142	Nalanda	Rajgir	Sithuara	7.97	497	323.05	205	16	40.1	16.36	1.81	0	256.2	14.2	7.8	9.72	0.21	0	14.52
143	Nalanda	Rahui	Vena	7.73	607	394.55	165	18	29.16	59.52	3.62	0	286.7	31.95	20.12	0.65	0.31	0	15.28
144	Nalanda	Nagarnausa	Nagarnausa	7.55	850	552.5	320	26	61.97	45.3	2.66	0	305	102.95	31.65	3.26	0.15	0	13.33
145	Nawada	Nawada	Mirjapur	7.75	440	286	175	18	31.59	21.65	1.88	0	250.1	14.2	5.65	9.67	0.25	0	13.93
146	Nawada	Nawada	Gonama	7.25	620	403	225	18	43.74	34.5	1.68	0	250.1	56.8	11.34	13.91	0.19	0	15.67
147	Nawada	Hisua	Hisua	7.5	542	352.3	190	26	30.38	32.5	1.66	0	256.2	31.95	11.69	12.72	0.21	0	14.79
148	Nawada	Kawakol	Kawakol ashram	7.73	252	163.8	80	18	8.51	16.29	0.3	0	97.6	24.85	10.95	0.08	0.67	0	9.97
149	Nawada	Narhat	Khanwa	7.55	453	294.45	165	22	26.73	21.6	0.98	0	189.1	35.5	16.58	10.35	0.72	0	14.66
150	Nawada	Meskaur	Meskaur	7.91	804	522.6	330	26	64.39	23.6	13.35	0	408.7	39.05	11.59	0	0.1	0.07	25.65
151	Nawada	Sirdala	Nawabganj	8.16	680	442	195	8	42.53	61.8	2.5	0	378.2	17.75	8	0	1.01	0	14.86
152	Nawada	Nawada	Nawada 2	7.65	505	328.25	205	16	40.1	17.56	2.01	0	250.1	28.4	4.99	5.24	0.11	0	15.59
153	Nawada	Pakribarwan	Pakribarwan	7.65	2180	1417	490	84	68.04	260	1.08	0	445.3	426	54.93	31.5	0.28	0	15.02
154	Nawada	Pakribarwan	Roh	7.95	419	272.35	195	36	25.52	11.5	2.04	0	219.6	28.4	3.75	5.77	0.14	0	16.31
155	Nawada	Kauakol	Rupau	7.99	1980	1287	510	80	75.33	196.5	29.5	0	652.7	227.2	112.8	31.77	0	0	17.28
156	Nawada	Warshaliganj	Shahpur Morh	7.94	490	318.5	140	18	23.09	42.8	1.67	0	256.2	17.75	5.6	0	0.28	0	15.36
157	Nawada	Hisua	Tungi	8.02	580	377	195	32	27.95	35.8	4.18	0	250.1	39.05	18.9	12.65	0.35	0	21.87
158	Nawada	Warshaliganj	Warshaliganj	7.79	439	285.35	165	28	23.09	24.65	1.91	0	213.5	21.3	5.87	7.98	0.19	0	16.71
159	Seikhpura	Barbigha	Ambari	8.16	2500	1625	725	50	145.8	238.5	2.5	0	732	312.4	178.32	31.45	0.93	0	12.63
160	Seikhpura	Barbigha	Barbigha	7.85	1030	669.5	320	20	65.61	76.58	14.11	0	311.1	110.05	82.87	23.49	0.19	0	14.94
161	Seikhpura	Barbigha	Keoti	7.96	683	443.95	260	26	47.39	34.5	2.99	0	189.1	81.65	65.79	9.45	0.06	0	14.81
162	Seikhpura	Barbigha	Koeri Bigha	8.01	870	565.5	255	18	51.03	59.65	31.2	0	286.7	78.1	49.08	26.89	0.18	0	15.1
163	Seikhpura	Seikhpura	Nemdarganj	7.89	743	482.95	245	36	37.67	54.55	4.3	0	359.9	46.15	17.99	0	0.76	0	12.74
164	Seikhpura	Seikhpura	Danibigha	8.15	840	546	255	18	51.03	69.88	0.96	0	396.5	31.95	44.17	0	0.47	0	14.69
165	Seikhpura	Chewara	Chewara	7.79	992	644.8	305	22	60.75	78.5	2.74	0	335.5	117.15	43.2	14.56	0.62	0	14.69

SN	District	Block	Location	pH	EC ($\mu\text{S}/\text{cm}$ 25°C)	TDS	TH as (CaCO_3)	Ca^{2+}	Mg^{2+}	Na^+	K^+	CO_3^{2-}	HCO_3^{2-}	Cl^-	SO_4^{2-}	NO_3^-	F^-	PO_4^{3-}	SiO_2
166	Seikhpura	Ariari	Ariari	8.18	1800	1170	555	48	105.71	155.65	5.8	0	603.9	205.9	101.13	8.69	0.89	0	12.91
167	Gaya	Fatehpur	Baraila More Powa	7.8	2102	1366.3	580	24	126.36	208.65	11.5	0	494.1	429.55	7.01	31.48	0.06	0	15.87
168	Gaya	Gaya	Bitho Sharif	7.21	1890	1228.5	680	38	142.16	95.8	28.1	0	298.9	440.2	50.13	29.35	0.08	0	14.84
169	Gaya	Bodhgaya	Bodhgaya	7.75	463	300.95	185	22	31.59	19.8	4.16	0	189.1	31.95	14.92	22.94	0.15	0	20.43
170	Gaya	Gaya sadar	Chand Chowra Chowk	7.4	1060	689	305	26	58.32	80.54	16.54	0	280.6	127.8	71.7	31.73	0.79	0	20.7
171	Gaya	Fatehpur	Fatehpur	7.92	480	312	145	22	21.87	36.8	0.64	0	122	53.25	41.73	29.48	0.39	0	18.01
172	Gaya	Manpur	Manpur	7.51	1140	741	395	12	88.69	56.44	25.64	0	353.8	134.9	55.65	31.01	0.1	0	15.15
173	Gaya	Gaya sadar	Ram kund	7.35	1204	782.6	405	26	82.62	78.8	14.77	0	292.8	166.85	96.31	32.51	1.4	0	18.47
174	Gaya	Gaya sadar	Sangat gali	7.4	810	526.5	295	26	55.89	50.67	0.73	0	268.4	92.3	38.13	27.88	0.74	0	17.85
175	Gaya	Wazirganj	Wazirganj	8.05	590	383.5	185	24	30.38	37.5	11.35	0	274.5	35.5	15.16	5.32	0.38	0	14.84
176	Bhojpur	Barhara	Bakhorapur	7.34	363	235.95	150	30	18.23	9.45	3.12	0	134.2	24.85	15.36	18.63	0.5	0.63	7.01
177	Bhojpur	Barhara	Balua	7.44	440	286	180	38	20.66	15.23	3.47	0	195.2	14.2	22.01	9.12	0.62	0	5.65
178	Bhojpur	Barhara	Barahara	7.36	712	462.8	255	64	23.09	39.3	5.26	0	183	60.35	82.29	40.67	0.3	0	5.8
179	Bhojpur	Bihiya	Bihiya	7.25	799	519.35	285	40	44.96	41.59	15.14	0	305	42.6	46.92	31.25	0.31	0	5.78
180	Bhojpur	Koilwar	Birampur	7.22	954	620.1	345	42	58.32	51.02	14.23	0	347.7	74.55	65.32	7.63	0.35	0	8.87
181	Bhojpur	Arrah	Chandawa	7.3	634	412.1	205	58	14.58	46.07	1.79	0	298.9	24.85	19.33	15.67	0.43	0	10.97
182	Bhojpur	Barhara	Dhusaria	7.31	1448	941.2	360	42	61.97	135.6	45.36	0	451.4	159.75	87.21	40.23	0.25	0	8.76
183	Bhojpur	Barhara	Ekauna	7.67	434	282.1	165	26	24.3	17.26	6.04	0	189.1	14.2	22.15	17.83	0.3	0.67	7.95
184	Bhojpur	Barhara	Farhda	7.9	281	182.65	105	26	9.72	13.46	1.25	0	122	10.65	11.6	3.94	0.09	0	6.71
185	Bhojpur	Garhani	Garhani	8.03	596	387.4	210	54	18.23	35.23	0.73	0	256.2	21.3	36.53	17.26	0.83	0.66	12.94
186	Bhojpur	Koilwar	Giddha	7.5	1213	788.45	350	54	52.25	100.7	17	0	329.4	177.5	41.23	42.31	0.3	0.54	8.64
187	Bhojpur	Sahar	Guljarpur	7.53	617	401.05	250	34	40.1	24.24	1.16	0	274.5	17.75	28.17	20.63	0.66	0.79	11.11
188	Bhojpur	Udwantnagar	Harnath Kundi	7.3	1240	806	420	24	87.48	67.56	40.2	0	469.7	117.15	41.23	22.56	0.35	0.93	9.68
189	Bhojpur	Jagdishpur	Jagdishpur 1	7.69	744	483.6	195	28	30.38	75.28	7.2	0	195.2	88.75	58.63	21.25	0.48	0	13.02
190	Bhojpur	Barhara	Jagatpur	7.73	536	348.4	205	22	36.45	25.36	1.21	0	237.9	28.4	21.98	6.07	0.72	0.66	9.67
191	Bhojpur	Ara	Jarawarpur Milki	7.53	634	412.1	210	26	35.24	44.38	2.66	0	262.3	49.7	20.83	10.25	0.44	0	12.18
192	Bhojpur	Shahpur	Karnempur	7.09	1673	1087.45	500	34	100.85	125.63	43.68	0	530.7	220.1	50.52	41.03	0.41	0.76	8.09
193	Bhojpur	Udwantnagar	Kasap	7.1	1643	1067.95	495	40	95.99	119.31	42.02	0	518.5	198.8	78.81	35.31	0.67	1.21	8.92

SN	District	Block	Location	pH	EC ($\mu\text{S}/\text{cm}$ @ 25°C)	TDS	TH as (CaCO_3)	Ca^{2+}	Mg^{2+}	Na^+	K^+	CO_3^{2-}	HCO_3^{2-}	Cl^-	SO_4^{2-}	NO_3^-	F^-	PO_4^{3-}	SiO_2
194	Bhojpur	Sandesh	Kori	7.4	976	634.4	340	40	58.32	60.12	10.33	0	280.6	106.5	68.39	41.23	0.26	1	10.51
195	Bhojpur	Koilwar	Kulharia	7.64	572	371.8	200	38	25.52	35.32	2.47	0	128.1	74.55	68.1	3.56	0.18	0.86	10.59
196	Bhojpur	Koilwar	Lodhipur	7.36	1443	937.95	470	104	51.03	98.36	26.34	0	372.1	191.7	98.32	41.32	0.08	1.09	11.41
197	Bhojpur	Koilwar	Mokhlisa	7.5	608	395.2	235	26	41.31	25.36	7.13	0	231.8	17.75	51.7	30.01	0.31	0	11.65
198	Bhojpur	Koilwar	Muhammadpur	7.53	762	495.3	285	56	35.24	40.2	3.34	0	170.8	102.95	65.63	25.02	0.14	0	14.66
199	Bhojpur	Sandesh	Nasratpur	7.32	1190	773.5	370	48	60.75	78.41	35.02	0	384.3	124.25	64.14	41.23	0.27	1.28	14.84
200	Bhojpur	Koilwar	Pachrukhiya	7.29	1142	742.3	355	48	57.11	80.32	29.87	0	396.5	95.85	67.26	42.36	0.14	0	8.79
201	Bhojpur	Sandesh	Pauna	7.29	1428	928.2	470	34	93.56	84.18	42.38	0	469.7	156.2	71.03	40.36	0.81	0	9.86
202	Bhojpur	Pirro	Pirro	7.28	1453	944.45	435	28	88.69	110.23	39.32	0	445.3	184.6	58.63	39.27	0.58	1.48	10.95
203	Bhojpur	Koilwar	Rajapur Bazar	7.54	447	290.55	170	28	24.3	15.2	6.7	0	152.5	53.25	9.01	10.36	0.21	0	9.52
204	Bhojpur	Sandesh	Sandesh	7.37	1519	987.35	475	66	75.33	109.11	35	0	500.2	163.3	81.3	34.02	0.14	0	14.1
205	Bhojpur	Udwantnagar	Sasaram Chota	7.33	1087	706.55	295	24	57.11	90.12	38.2	0	451.4	63.9	43.48	35.01	0.12	0	9.43
206	Bhojpur	Barhara	Simariya	7.25	1310	851.5	480	44	89.91	65.23	20.12	0	469.7	131.35	61.23	7.17	0.27	0	7.77
207	Bhojpur	Koilwar	Songhata	7.37	666	432.9	260	26	47.39	28.39	2.46	0	335.5	24.85	13.21	7.41	0.35	0	9.4
208	Bhojpur	Udwantnagar	Udwantnagr	7.34	793	515.45	245	18	48.6	61.3	11.32	0	311.1	81.65	7.66	10.35	0.56	0	11.74
209	Buxar	Barhampur	Bagen Bazar	7.83	337	219.05	120	14	20.66	18.23	2.3	0	158.6	14.2	7.66	7.76	0.53	1.45	14.16
210	Buxar	Brahmpur	Brahmpur	7.54	635	412.75	240	36	36.45	28.69	6.84	0	311.1	24.85	10.24	2.65	0.25	1.29	10.08
211	Buxar	Simri	Barka Rajpur	7.25	1304	847.6	425	32	83.83	98.63	8.61	0	542.9	102.95	22.45	38.18	0.13	1.39	9.12
212	Buxar	Buxar	Buxar	7.26	945	614.25	275	46	38.88	81.36	10.63	0	353.8	85.2	48.08	8.69	0.36	1.36	11.65
213	Buxar	Chausa	Chausa	7.21	2380	1547	625	48	122.72	198.64	98.02	0	933.3	188.15	89.26	61.04	0	1.07	11.54
214	Buxar	Buxar	Churamanapur DW	7.4	919	597.35	290	16	60.75	67.32	12.84	0	451.4	21.3	24.11	38.24	0.49	0.94	8.47
215	Buxar	Buxar	Danikutia	7.41	870	565.5	235	12	49.82	84.03	10.57	0	439.2	28.4	23.21	8.19	0.5	0.83	9.84
216	Buxar	Buxar	Dudharchak	7.29	579	376.35	245	20	47.39	15.23	2.69	0	305	14.2	10.79	2.31	0.35	0.72	11.91
217	Buxar	Dumraon	Dumraon	7.38	855	555.75	290	24	55.89	55.71	10.23	0	268.4	74.55	56.3	43.21	0.62	0.68	14.5
218	Buxar	Simri	Dumri	7.37	758	492.7	320	28	60.75	21.3	4.71	0	396.5	28.4	7.53	2.85	0.26	0.77	10.56
219	Buxar	Simri	Durasan	7.43	1130	734.5	340	22	69.25	77.85	32.8	0	317.2	127.8	84.48	37.23	0.2	0	13.14
220	Buxar	Barhampur	Hathilpur	7.67	467	303.55	200	36	26.73	12.36	3.31	0	219.6	14.2	11.56	17.32	0	0	9.67
221	Buxar	Buxar	Jugia Dera	7.66	424	275.6	150	24	21.87	25.88	2.1	0	189.1	14.2	15.55	10.02	0.59	1.41	11.64

SN	District	Block	Location	pH	EC ($\mu\text{S}@$ 25°C)	TDS	TH as (CaCO ₃)	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	CO ₃ ⁻	HCO ₃ ²⁻	Cl ⁻	SO ₄ ²⁻	NO ₃ ⁻	F ⁻	PO ₄ ³⁻	SiO ₂
222	Buxar	Simri	Karathar	7.43	625	406.25	275	36	44.96	11.72	2.5	0	305	28.4	15.55	1.85	0.32	1.15	15.93
223	Buxar	Barhampur	Khochariwan	7.46	505	328.25	220	26	37.67	12.62	1.38	0	237.9	21.3	14.17	3.76	0.64	0	14.81
224	Buxar	Buxar	Kritpur	7.47	645	419.25	275	22	53.46	16.96	2.72	0	317.2	24.85	15.55	11.62	0.25	0	15.84
225	Buxar	Simri	Manikpur	7.41	695	451.75	295	38	48.6	19.62	4.3	0	372.1	17.75	8.7	2.9	1.38	0	11.2
226	Buxar	Barhampur	Mharajgunj	7.44	739	480.35	260	22	49.82	40.99	8.96	0	311.1	28.4	26.47	52.08	0.5	0	10.79
227	Buxar	Buxar	Mishraulia	7.16	1769	1149.85	660	42	134.87	78.63	32.26	0	439.2	252.05	124.15	43.52	0.64	0	12.52
228	Buxar	Simri	Neazipur	7.39	779	506.35	295	24	57.11	35.6	6.13	0	402.6	21.3	7.41	21.75	0.37	0	8.24
229	Buxar	Barhampur	Raghunathpur	7.69	929	603.85	325	24	64.39	51.5	12.3	0	231.8	117.15	65.31	38.12	0.55	1.32	9.43
230	Buxar	Rajpur	Rajpur	7.51	1312	852.8	525	40	103.28	50.36	15.78	0	372.1	159.75	85.41	37.33	0.57	1.44	10.86
231	Buxar	Buxar	Ramobariya	7.5	903	586.95	390	28	77.76	24.66	2.47	0	457.5	24.85	18.47	20.56	0.6	2.16	9.43
232	Buxar	Simri	Sohiar	7.34	1419	922.35	440	46	78.97	97.51	41.3	0	463.6	131.35	98.01	42.36	0	1.01	8.97
233	Buxar	Buxar	Thodagaon	7.48	743	482.95	340	28	65.61	12.04	1.48	0	329.4	28.4	31.02	25.42	0.05	1.16	11.56
234	Darbhanga	Baheri 1	Baheri	7.7	436	283.4	90	28	4.86	56.3	2.08	0	231.8	10.65	2.85	0	0.51	0	9.66
235	Darbhanga	Baheri	Bithauli	7.85	392	254.8	100	26	8.51	43.65	2.02	0	207.4	14.2	1.98	0	0.09	0.02	9.46
236	Darbhanga	Darbhanga	Darbhanga	7.95	371	241.15	65	24	1.22	55.78	1.49	0	189.1	17.75	3.69	0	0.35	0.1	7.73
237	Darbhanga	Baheri	Jorja	7.8	567	368.55	200	42	23.09	37.25	1.59	0	305	17.75	1.55	0	0.69	0.17	9.31
238	Darbhanga	Sakri	Sakri 1	7.86	548	356.2	155	40	13.37	52.6	1.67	0	311.1	10.65	1	0	0.68	0.21	10.92
239	Darbhanga	Simri	Simri (Bithauli)	8	428	278.2	120	28	12.15	40.78	1.71	0	244	7.1	3.58	0	0.67	0.31	7.65
240	Samstipur	Vidyapatinagar	Sahit (Bajidpur)	7.72	541	351.65	200	52	17.01	30.52	4.03	0	213.5	28.4	53.41	0.27	0.83	0.42	7.52
241	Samstipur	Kalyanpur	Basudebpur	7.66	582	378.3	250	48	31.59	19.4	3.11	0	286.7	14.2	35.75	0	0.65	0.22	9.76
242	Samstipur	Ujiarpur	Dandia Asadpur	7.78	731	475.15	295	88	18.23	31.85	4.52	0	329.4	31.95	35.19	10.3	0.87	0.11	11.11
243	Samstipur	Jitwarpur	Harpur Aloth	7.89	548	356.2	230	42	30.38	20.5	1.38	0	280.6	17.75	11	2.66	0.75	0.12	7.44
244	Samstipur	Jitwarpur	Jathmal pur	7.63	1446	939.9	510	46	95.99	79.05	29.6	0	390.4	173.95	99.43	58.87	0.77	0.1	5.02
245	Samstipur	Vibhutipur	Kalyanpur	7.9	609	395.85	220	54	21	35.65	3.45	0	317.2	14.2	18.67	4.57	0.92	0.41	9.17
246	Samstipur	Warisnagar	Kishanpur	7.76	1125	731.25	485	34	97.2	45.32	6.66	0	268.4	184.6	100.27	0.73	0.69	0.04	6.34
247	Samstipur	Mohiuddinagar	Madudabad 1	7.7	600	390	245	28	42.53	21.52	8.33	0	256.2	39.05	33.47	8.54	0	0.06	6.72
248	Samstipur	Tajpur Morwa	Motipur	7.75	615	399.75	240	36	36.45	34.88	2.44	0	262.3	31.95	48.08	0	0.78	0.02	9.57
249	Samstipur	Vibhutipur	Patpara	7.74	687	446.55	255	34	41.31	41.65	2.84	0	280.6	28.4	61.54	0	0.71	0.01	10.21

SN	District	Block	Location	pH	EC ($\mu\text{S}@$ 25°C)	TDS	TH as (CaCO ₃)	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	CO ₃ ⁻	HCO ₃ ²⁻	Cl ⁻	SO ₄ ²⁻	NO ₃ ⁻	F ⁻	PO ₄ ³⁻	SiO ₂
250	Samstipur	Rosera	Rosera	7.65	1093	710.45	445	46	80.19	41.98	7.25	0	329.4	110.05	109.52	0	0.59	0.02	5.59
251	Samstipur	Sarai Ranjan	Sarai Ranjan	7.98	1047	680.55	375	34	70.47	65.9	2.28	0	317.2	149.1	36.83	0.14	0.85	0.4	7.72
252	Samstipur	Tajpur Morwa	Tajpur	7.73	1963	1275.95	750	254	27.95	103.76	8.05	0	463.6	223.65	196.23	51.55	0.41	0	11.05
253	Samstipur	Ujiarpur	Bhagwanpur Kamla	7.94	908	590.2	370	18	78.97	39.2	2.71	0	262.3	99.4	92.11	0	0.61	0	6.94
254	Sitamarhi	Dumra	Bhupbhairo khaptola	8.1	382	248.3	173.5	44	15.43	9.5	3.9	0	195.2	10.65	8.78	0	0.42	0.08	4.42
255	Sitamarhi	Sitamarhi	Kodwara Tala	8.12	314	204.1	140	52	2.43	11.12	1.85	0	183	10.65	3.23	0	0.22	0.44	4.63
256	Sitamarhi	Sitamarhi	Punaaura	8.18	443	287.95	200	68	7.29	12.6	2.1	0	189.1	49.7	5.4	0.73	0.47	0.23	4.01
257	Sitamarhi	Sitamarhi	Sitamarhi	8.16	319	207.35	135	52	1.22	16.55	2.38	0	164.7	10.65	2.18	0	0.4	0.39	2.76
258	Sitamarhi	Sursand	Sursand	8.1	293	190.45	135	46	4.86	7.78	1.78	0	146.4	10.65	6.5	0	0.66	0.44	4.05
259	Sitamarhi	Runi saidpur	Thumba	8.15	279	181.35	125	46	2.43	9.56	1.64	0	128.1	7.1	17.35	0	0.56	0.17	4.32
260	Begusarai	Barauni	Bihat	7.85	750	487.5	280	42	42.53	41.1	7.52	0	256.2	67.45	61.54	2.83	0.29	0.1	7.16
261	Begusarai	Barauni	Begusarai	7.93	507	329.55	215	36	30.38	11.34	3.3	0	225.7	31.95	18.67	0	0	0	0.37
262	Begusarai	Begusarai	Begusarai Fc/ib	7.87	637	414.05	245	42	34.02	31.22	4.72	0	250.1	53.25	40.38	5.89	0	0.33	5.92
263	Begusarai	Begusarai	Hardia	7.84	748	486.2	350	46	57.11	11.56	5.68	0	176.9	99.4	72.2	35.38	0	0.37	3.47
264	Begusarai	Begusarai	Harpur	7.9	791	514.15	295	40	47.39	31.25	9.15	0	128.1	92.3	114.65	39.09	0.01	0.31	1.41
265	Begusarai	Cheria Bariarpur	Manjaul	7.95	1151	748.15	410	40	75.33	69.32	3.21	0	213.5	170.4	100.27	57.9	0.37	0.21	2.43
266	Begusarai	Begusarai	Mohanpur Usrahi	8.1	617	401.05	245	22	46.17	24.55	2.05	0	250.1	46.15	20.01	21.22	0.18	0.15	5.81
267	Begusarai	Teghra	Naya nagar, dularpur	7.96	645	419.25	290	26	54.68	11.22	4.72	0	237.9	49.7	46.08	0.19	0	0.17	2.3
268	Begusarai	Teghra	Teghra	8.01	755	490.75	325	24	64.39	19.25	5	0	231.8	67.45	72.2	4.4	0.06	0.24	2.85
269	Muzaffarpur	Turki	Barkurwa morh	7.75	1770	1150.5	610	170	44.96	118.13	19.86	0	176.9	347.9	196.23	59.03	0.06	0.21	7.1
270	Muzaffarpur	Mushhari	Bhagwanpur chowk	7.95	1077	700.05	370	36	68.04	57.35	20.45	0	256.2	110.05	147.11	6.03	0.7	1.15	7.58
271	Muzaffarpur	Bochaha	Bochaha	8.01	1190	773.5	420	34	81.4	71.95	5.13	0	298.9	131.35	114.65	56.97	0	0.19	3.17
272	Muzaffarpur	Minapur	Garagalia	8.01	443	287.95	195	36	25.52	9.58	5.88	0	189.1	21.3	46.08	3.84	0	0.26	0.8
273	Muzaffarpur	Mushari	Japaha	7.86	1287	836.55	305	24	59.54	28.65	31.56	0	341.6	163.3	75.15	45.32	0.02	0.03	5.71
274	Muzaffarpur	Katra 1	Katra 1	8.1	546	354.9	200	28	31.59	34.87	2.86	0	237.9	42.6	16.06	0.25	0	0.09	0.07
275	Muzaffarpur	Gaighat	Ramnagar	8	480	312	205	20	37.67	17.44	3.75	0	219.6	35.5	4.3	0	0	0.36	2.7
276	Muzaffarpur	Bochaha	Shukrahat	7.93	654	425.1	255	12	54.68	31.25	8.16	0	268.4	42.6	28.61	0	0	0.02	4.85
277	Muzaffarpur	Bochaha	Sarfuddinpur	8	468	304.2	205	28	32.81	15.55	5.32	0	189.1	28.4	30.25	1.98	0	0	5.66

This page has been left blank

**District wise percentage of well showing Rise, fall or no significant decline trend (2012-2021)
during Pre-Monsoon and Post-Monsoon Season**

SN	District	Pre-monsoon (in percent)			Post-monsoon (in percent)		
		Rise	Fall	No Significant trend	Rise	Fall	No Significant trend
1	Araria	100	0	100	29	0	100
2	Aurangabad	56	44	56	24	44	71
3	Banka	30	70	60	67	70	67
4	Begusarai	86	14	79	96	14	58
5	Bhagalpur	50	50	50	53	50	67
6	Bhojpur	89	11	68	79	11	55
7	Buxar	83	17	67	82	17	36
8	Darbhanga	50	50	83	89	50	78
9	Gaya	57	43	29	78	43	61
10	Gopalganj	36	64	91	71	64	90
11	Jamui	13	88	88	75	88	63
12	Jehanabad	82	18	64	50	18	75
13	Kaimur	33	67	50	50	67	80
14	Katihar	100	0	69	93	0	100
15	Khagaria	56	44	78	87	44	80
16	Kishanganj	67	33	100	25	33	88
17	Lakhisarai	33	67	33	71	67	57
18	Madhepura	86	14	86	73	14	100
19	Madhubani	100	0	63	92	0	76
20	Munger	33	67	17	78	67	67
21	Muzaffarpur	62	38	76	79	38	63
22	Nalanda	70	30	50	53	30	63
23	Nawada	11	89	67	36	89	0
24	E Champaran	50	50	83	54	50	85
25	Patna	37	63	40	54	63	71
26	W Champaran	60	40	80	63	40	93
27	Purnia	43	57	71	53	57	94
28	Rohtas	9	91	55	47	91	74
29	Saharsa	44	56	78	69	56	94
30	Samastipur	92	8	33	88	8	25
31	Saran	63	38	69	81	38	62
32	Seikhpura	50	50	83	71	50	71
33	Sheohar	0	100	0	33	100	0
34	Sitamarhi	90	10	50	94	10	75
35	Siwan	13	88	63	71	88	76
36	Supaul	46	54	92	33	54	100
37	Vaishali	92	8	67	88	8	44

Disclaimer

The Water Level Data has been analysed by using GEMS (Ground Water Estimation and Management System) software. This software is designed to register the value of total depth as water level in case of dry-well. The well may dry by various reasons.

These dry wells sometimes give errortic information. As these wells are not observed in a group to represent an area, these well are kept intact in this report.
