GROUND WATER LEVEL BULLETIN

AUGUST- 2025

HIMACHAL PRADESH

EXECUTIVE SUMMARY

As a component of the National Ground Water Monitoring Programme, the CGWB, NHR, Dharamshala conducts monitoring of the ground water conditions on a quarterly basis: in January, Pre-monsoon (May) August and Post-monsoon (November). Additionally, a yearly assessment of ground water quality is performed in May. As of Aug-2025, the Northern Himalayan Region of the Central Ground Water Board monitored 127 dug wells, 66 piezometers and 25 springs. This comprehensive effort aims to portray the variations in the state's ground water conditions across different aquifers.

In Aug 2025, around 89.11% of the state's area exhibited a depth to water level within 20 meters below ground level. Deeper water levels of more than 20 m cover 10.89 % area of the State covering mainly Una, Sirmaur,Solan, Kangra, districts.

Annual water level comparison with previous year Aug-2023 to Aug-2025 has shown that about 55.09% area of the state experienced rise in annual water and while comparison with Aug-2024 to Aug-2025 about 78.02% area of the state experienced rise in annual water level fluctuation. 84.07% of the area experienced rise in decadal mean water level of 2015-2024 with respect to Aug, 2025.

कार्यकारी सारांश

नेशनल ग्राउंड वॉटर मॉनिटरिंग प्रोग्राम के एक हिस्से के रूप में, केन्द्रीय भूमि जल बोर्ड के उत्तरी हिमालय क्षेत्र, धर्मशाला हर तीन महीने में भू-जल की स्थिति की निगरानी करता है: जनवरी, प्री-मानसून (मई), अगस्त और पोस्ट-मानसून (नवंबर) । इसके अलावा, हर साल मई माह में भू-जल की गुणवत्ता का आकलन भी किया जाता है। अगस्त 2025 में , केन्द्रीय भूमि जल बोर्ड के उत्तरी हिमालय क्षेत्र ने 127 कुओं, 66 पाइज़ोमीटर और 25 झरनों की निगरानी की। इस व्यापक प्रयास का उद्देश्य राज्य के विभिन्न जलभृतों में ग्राउंड वॉटर की स्थिति में बदलाव को दिखाना है।

अगस्त 2025 में, राज्य के लगभग 89.11% क्षेत्र में जल स्तर जमीन से 20 मीटर की गहराई के भीतर था। 20 मीटर से अधिक गहराई वाले जल स्तर वाले क्षेत्र राज्य के केवल 10.89% हिस्से में हैं, जिनमें मुख्य रूप से ऊना, सिरमौर, सोलन और कांगड़ा जिले शामिल हैं।

पिछले साल (अगस्त 2023 से अगस्त 2025) की तुलना में लगभग 55.09% क्षेत्र में वार्षिक जल स्तर में वृद्धि देखी गई , अगस्त 2024 से अगस्त 2025 की तुलना में, राज्य के लगभग 78.02% क्षेत्र में वार्षिक जल स्तर में वृद्धि देखा गया। 2015-2024 के दस-वर्षीय औसत जल स्तर की तुलना में, अगस्त 2025 तक 84.07% क्षेत्र में जल स्तर में वृद्धि हुई।

ABSTRACT

Ground water level Scenario during Aug-2025 highlighting the findings, status of ground water level in different aquifers and its seasonal, annual and decadal comparison.

INTRODUCTION

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

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

Groundwater levels are being measured by Central Ground Water Board four times a year during January, May, August and November. The regime monitoring started in the year 1969 by Central Groundwater Board. A network of 25437 observation wells called **National Hydrograph Network Stations (NHNS)**, as on 30.04.2023, located all over the country is being monitored.

STUDY AREA

Himachal Pradesh is located between the north latitude30^{o}22’40” &33^{o}12’40”and east longitude 75^{o}47’55” & 79^{o}04’20”. It falls in Survey of India topographic sheets Nos. 52D, 52H, 52L, 53A, 53B, 53F, 53E and 53I and covers an area of 55,673 sq km. It is one of the predominantly hilly states in India, which lies in the western Himalayas. The length of Himachal Pradesh is about 355 km i.e., from northwestern part of Chamba to southeastern part of Kinnaur. The breadth of the state is about 270 km i.e., from western part of Una to northeast part of Lahaul and Spiti Disrtict. The state is bounded by the state of Jammu & Kashmir in north, Punjab state in west, Haryana state in south and Uttrakhand state in southeast and shares an international border with China (Tibet) in northeast.

Administratively, the state is divided in 12 Districts, 76 Tehsils, 34 Sub-Tehsils and 78 Blocks. There are 20,690 villages, 3,226 Gram Panchayats, 59 towns, 28 Nagar Panchayats and 25 Nagar Parishads including Municipal Corporations. Lahaul & Spiti is the largest and Hamirpur is the smallest District of the state with geographical area of 12,835 and 1,118 sq km respectively.

The state has a population of 68,64,602 persons (Census 2011) having an average population density of 128 person per sq km. The male population in the state is 34,81,873 persons and female population is 33,82,729. The rural

and urban population in the state is 61,76,050 and 6,00,552 persons respectively. The density of population in the state varies from as low as 2 persons/sq.km in Lahaul and Spiti District to 406 persons/sq km in Hamirpur District as compared to the state average of 128 persons/sq km.

Himachal region presents an intricate mosaic of mountain ranges, hills and valleys with altitude ranging from 350 m to 6500 m amsl. The Dhauladhar range looks in supreme majesty over the Kangra valley while the Pir Panjal, the Great Himalaya and the Zanskar ranges guard over Chamba, Lahaul & Spiti, Kullu and Kinnaur Districts. The mountain slopes are covered with forests and meadows. The valleys below are interspersed with numerous streams, fields and quiet homesteads. There is general increase in elevation from east to west and from south to north. The physiographic divisions from south to north are the Outer Himalayas also known as Siwaliks (350 to 1500 m amsl), the Lesser Himalayan Range (1500-5000 m amsl), Great Himalayan Range (5000 – 6000 m amsl) and Zanskar Range (> 6000 m amsl)

Himachal state has a unique distinction of having drainage systems of both the Indus and the Ganga basin. The major river systems of the region are the Chandra-Bhaga or the Chenab, the Ravi, the Beas, the Satluj and the Yamuna. The catchments of the rivers are fed by snow and rainfall, And are protected by fairly extensive cover of natural vegetation. Major rivers of the Indus River basin are the Chenab, the Ravi, the Beas and the Satluj. The Yamuna is the only river contributing water to Ganga basin.

The southwestern monsoon contributes about 70% of rain fall during monsoon period from June to September and about 30%occurs during non-monsoon period due to western disturbances and in the form of thunder storm. Generally, rainfall increases from south to north. Western disturbances also shower rainfall in winters. Beyond Kullu towards Lahaul & Spiti and Kinnaur, rain fall decreases due to rain shadow effect. Spiti is the driest area with 50 mm rainfall because of being enclosed by High Mountain from all sides. The average annual rainfall in the Districts of the state varies from about 600 mm in Lahaul & Spiti to more than 2400 mm in Kangra.

GROUND WATER LEVEL MONITORING

Central Ground Water Board, Northern Himalayan Region, is monitoring changes in groundwater regime in Himachal Pradesh state on quarterly basis continuously. This is facilitated by a network of monitoring stations in the State located in diverse hydrogeological and geomorphic units. The number of operational wells till May 2025 was 222 which include 128 dug wells, 65 piezometers and 29 springs. In Aug 2025, 218 wells which include 127 dug wells, 66 piezometers and 25 springs. The district-wise breakup of the water level monitoring stations is given in **Table-1**.

Sl. No	Name of the District	Number of GW Monitoring Stations (AUG-2025)				
		Dug Well	Piezometer	Hand pump	Spring	Total
1	Hamirpur	6	3	-	-	9
2	Bilaspur	4	8	-	-	12
3	Kangra	42	19	-	2	63
4	Kullu	**Not measured due to bad Weather, Flood, Road cuts & Land Slide**				0
5	Mandi	8	4	-	1	13
6	Sirmaur	19	17	-	1	37
7	Solan	14	5	-	-	19
8	Una	33	8	-	-	41
9	Chamba	1	2	-	21	24
	TOTAL	**127**	**66**	**-**	**25**	**218**

Table-1 District-wise breakup of the water level monitoring stations

RAINFALL

The rainfall data collected and compiled from weekly and monthly weather reports from India Meteorological Department were used to analyze the rainfall for the period June 2025 – August 2025. Table-2 gives the district-wise rainfall data for the period June 2025 – August 2025.

District wise rainfall and departure for June 2025			
Districts	**Actual (In Mm)**	**Normal (In Mm)**	**Dep (In%)**
Bilaspur	164.5	102.1	61
Chamba	115.7	121.8	-5
Hamirpur	212.1	114.1	86
Kangra	265.9	181.4	47
Kinnaur	31.2	41.8	-25
Kullu	121.3	86.9	40
Lahaul & Spiti	22.5	47.8	-53
Mandi	306.2	171.5	79
Shimla	181.0	110.4	64
Sirmaur	287.4	165.8	73
Solan	224.8	137.3	64
Una	158.1	103.8	52
Sub- Division HP	135.0	101.1	34

District wise rainfall and departure for July 2025			
Districts	**Actual (In Mm)**	**Normal (In Mm)**	**Dep (In%)**
Bilaspur	300.1	272.2	10
Chamba	249.1	305.7	-18
Hamirpur	366.4	328.5	12
Kangra	528.7	589.3	-10
Kinnaur	57.1	65.9	-13
Kullu	230.2	184	25
Lahaul & Spiti	32.2	131.5	-75
Mandi	574.7	386.5	49
Shimla	357.9	210.2	70
Sirmaur	453.5	437	4
Solan	249.2	303.3	-18
Una	369	329	12
Sub- Division HP	250.3	255.9	-2

District wise rainfall and departure for August 2025			
Districts	**Actual (In Mm)**	**Normal (In Mm)**	**Dep (In%)**
Bilaspur	598.7	316.8	89
Chamba	561.6	291.7	93
Hamirpur	617.9	400.6	54
Kangra	816.2	631.5	29
Kinnaur	143.3	77.6	85
Kullu	477.5	180.2	165
Lahaul & Spiti	129.7	117.6	10
Mandi	667.9	395.3	69
Shimla	438	196.4	123
Sirmaur	557.5	402.1	39
Solan	627.9	287.9	118
Una	815.1	372.2	119
Sub- Division HP	431.3	256.8	68

Table-2 District-wise Rainfall from 01.06.2025 to 31.08.2025

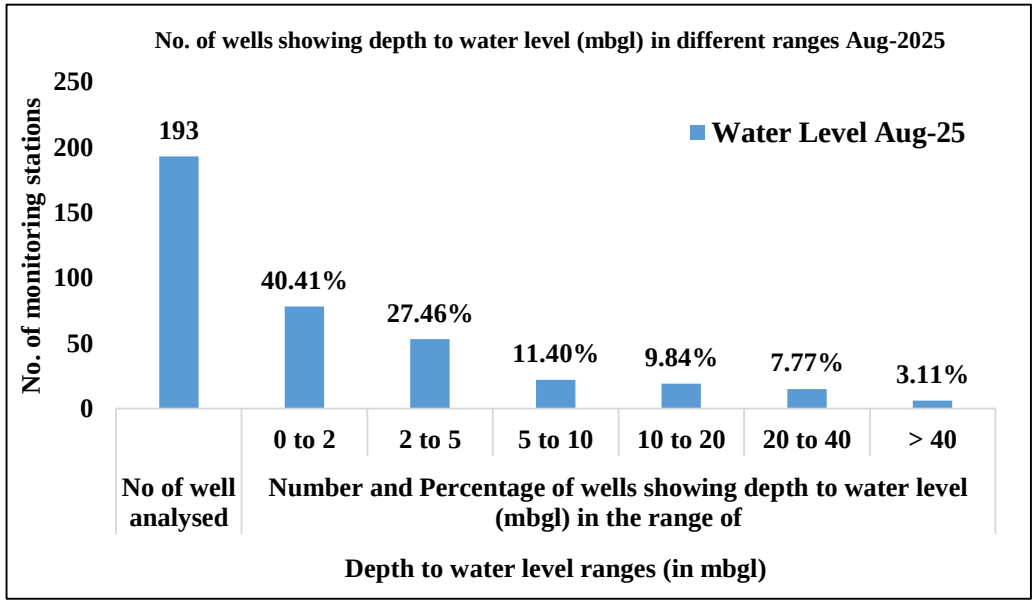
DEPTH TO WATER LEVEL (AUG-2025)

The depth to water level, recorded during Aug 2025 ranged between 0.14 m (Loharli, Una District) and 95.13 m bgl (Tikkri (Pz) Solan District). Out of 193 stations monitored, the majority of 172 NHS (89.12%) recorded DTWL, in the range between 2 - 20 m bgl. 78 stations (40.42%), recorded shallow water levels, less than 2 m bgl and 21 stations (10.88%), recorded deep water levels, more than 20 m bgl in the state.

A perusal of the DTW map for August 2025 indicates that the shallow water level area less than 2 m bgl occurs in all the valleys of Himachal Pradesh except Nalagarh Valley, mainly in Balh valley (Mandi District), all the valleys of Kangra District including Kangra Palampur valley and Nurpur-Indaura valley, eastern & central part of Una valley and northern part of Kullu valley. 2-5 m bgl and 5-10 m bgl water level is recorded in couple of pockets in almost all the valley areas. 10-20 m bgl water level is recorded in pockets in Una Valley, northern part of Paonta valley and Nalagarh valley. Deeper water levels are found at some places in Nalagarh and Una valley.

Season	No of well analysed	Number and Percentage of wells showing depth to water level (mbgl) in the range of											
		0 to 2		2 to 5		5 to 10		10 to 20		20 to 40		> 40	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Aug-25	193	78	40.41	53	27.46	22	11.40	19	9.84	15	7.77	6	3.11

Depth to Water Level Distribution of Percentage of Observation Wells August 2025



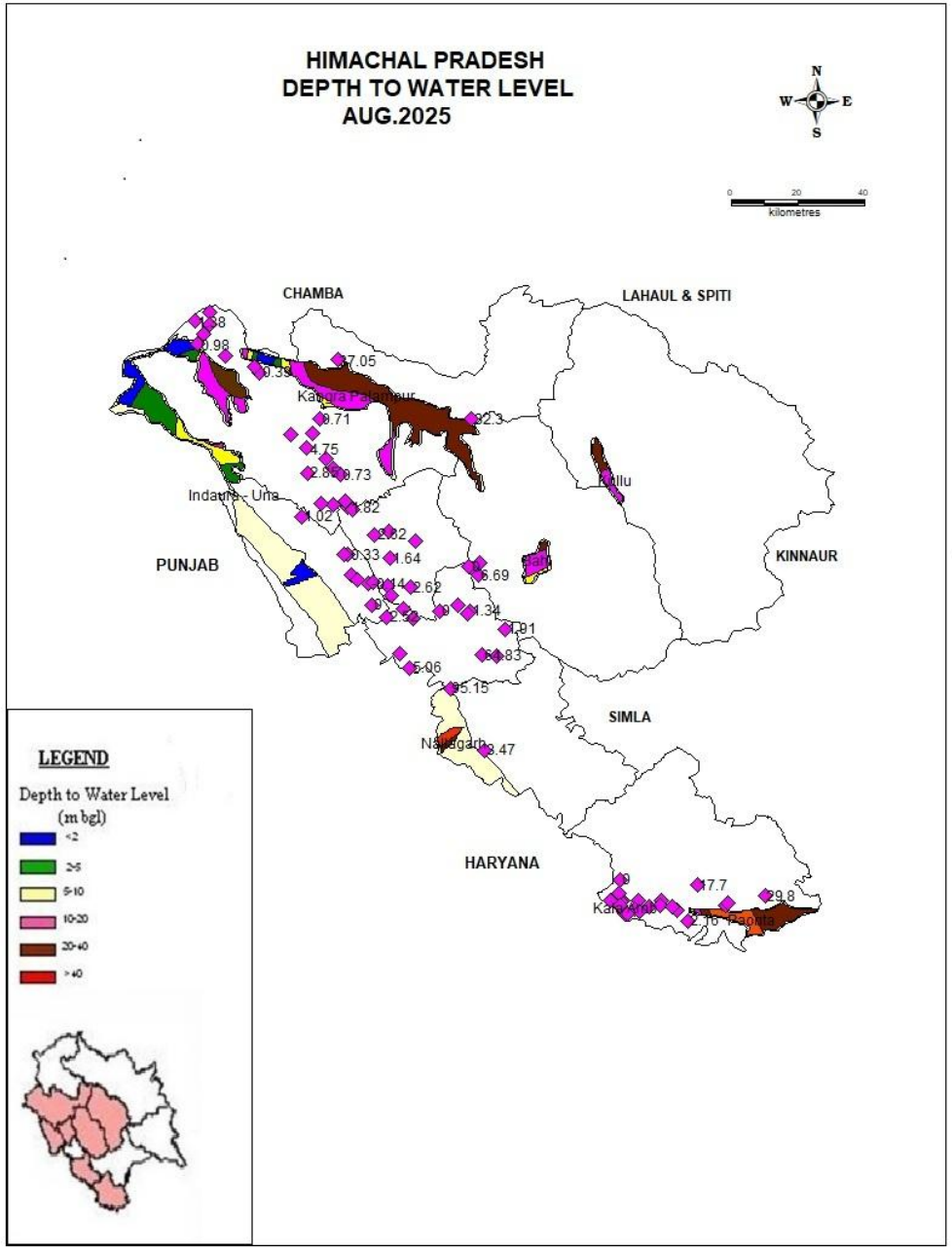


Fig:1 Depth to Water Level Aug-2025

SEASONAL WATER LEVEL FLUCTUATION

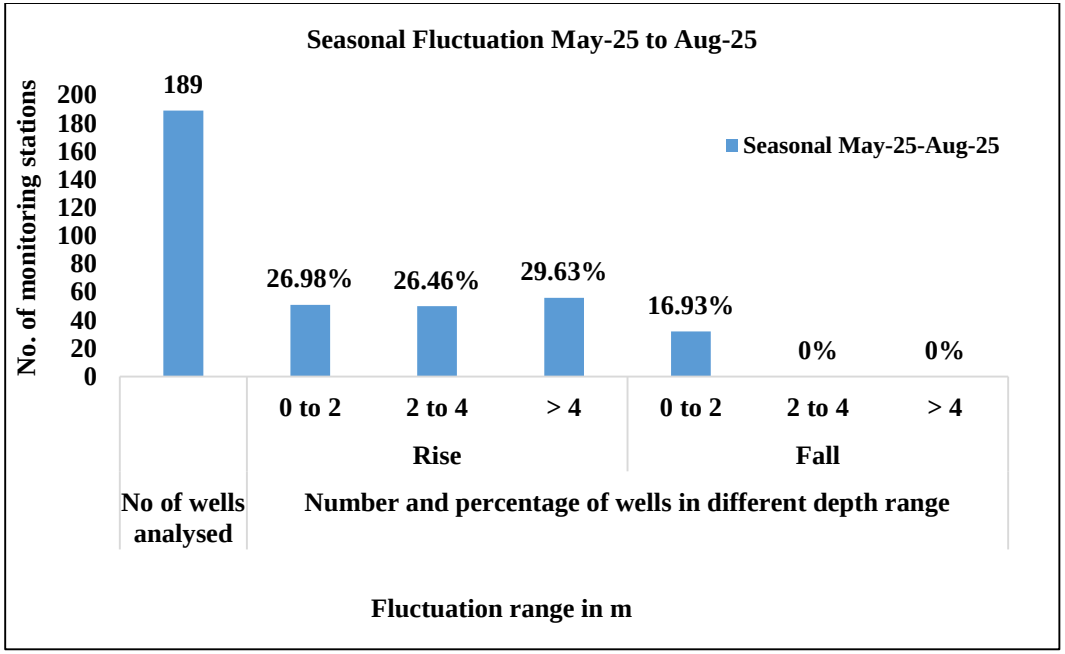
To study the effect of monsoon and subsequent utilization for various needs like agriculture, irrigation and domestic etc, changes in water level are studied and are discussed below.

May 2025 to Aug 2025

Seasonal fluctuation of water level was analyzed for 189 stations for the period May 2025 – Aug 2025. Out of the 189 stations, 157 stations have shown rise in water level and remaining 32 stations have shown fall in water level.

The minimum rise in water level of 0.14 m was observed in Kangra District and the maximum rise 36.61 m was noticed in Sapri (Pz), Kangra District. Out of the 157 stations which have shown rise in water level, 51 stations show rise between the range of 0 to 2 m, 50 stations between 2 to 4 m and remaining 56 stations show rise more than 4 m.

Comparison	Season	No of wells analysed	Number and percentage of wells in different depth range											
			Rise						Fall					
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%
Seasonal	May-25-Aug-25	189	51	26.98	50	26.46	56	29.63	32	16.93	0	0	0	0



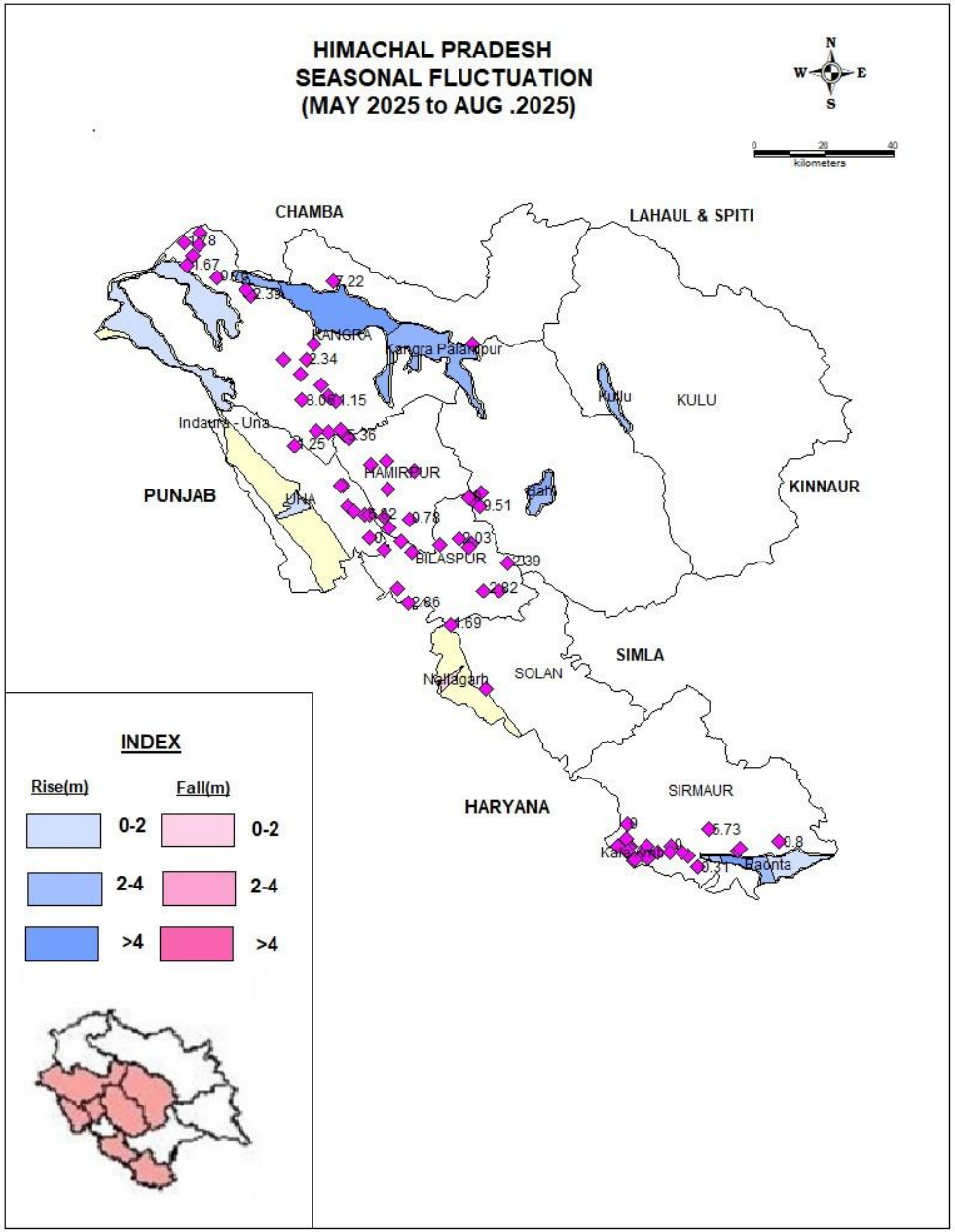


Fig:2 Seasonal fluctuations for the period May 2025 – Aug 2025

ANNUAL WATER LEVEL FLUCTUATION

Annual fluctuation in water level of GWMS during different monitoring period was analysed and discussed below.

Aug 2023 to Aug 2025

Annual fluctuation of water level, has been worked out by comparing depth to water level of Aug 2023, with Aug 2025 and the data presented its frequency distribution in various rise and fall ranges.

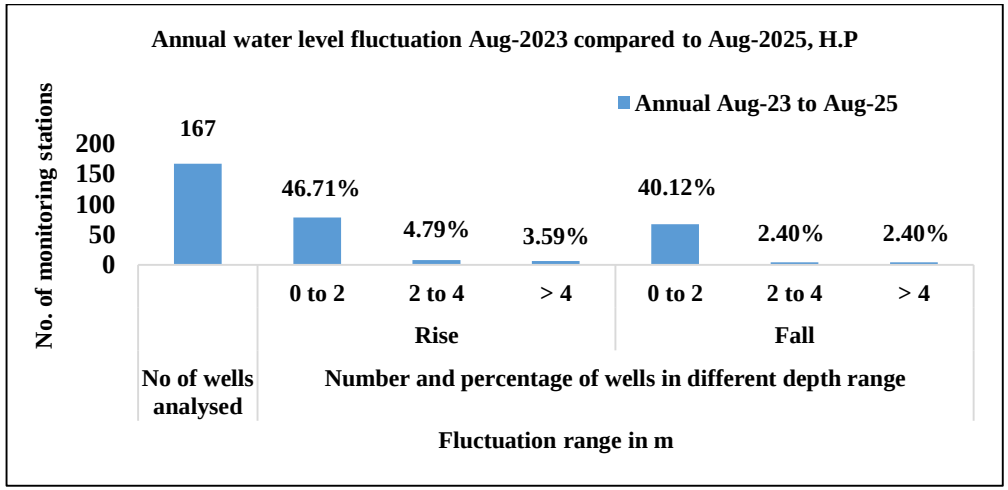
Out of the 167 stations analysed, 92 stations (55.09%) have shown rise in water level ranging from 0.01 (Sirmaur District) to 25.77 m (Bilaspur District).

Out of 92 stations which have shown rise in water level, 78 stations show rise between the range of 0 to 2 m, 8 station has shown rise between 2 to 4 m and 6 station shown rise more than 4 m.

Similarly, for 75 stations which have shown fall in water level, 67 stations show fall between the range of 0 to 2 m, 4 stations have shown fall between 2 to 4 m and 4 stations has shown fall more than 4 m.

A perusal of map of Annual Water Level Fluctuation for August 2023 to August 2025 shows fall in water level in all the monitoring areas including Kangra Palampur valley, of Indora-Nurpur valley, Nallagarh valley, Kullu valley and of Una valley. Areas are showing water level rise in small parts of Balh valley, kangra palampur valley and Nurpur Indora valley.

Comparison	Season	No of wells analysed	Number and percentage of wells in different depth range											
			Rise						Fall					
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%
Annual	Aug-23 to Aug 25	167	78	46.71	8	4.79	6	3.59	67	40.12	4	2.40	4	2.40



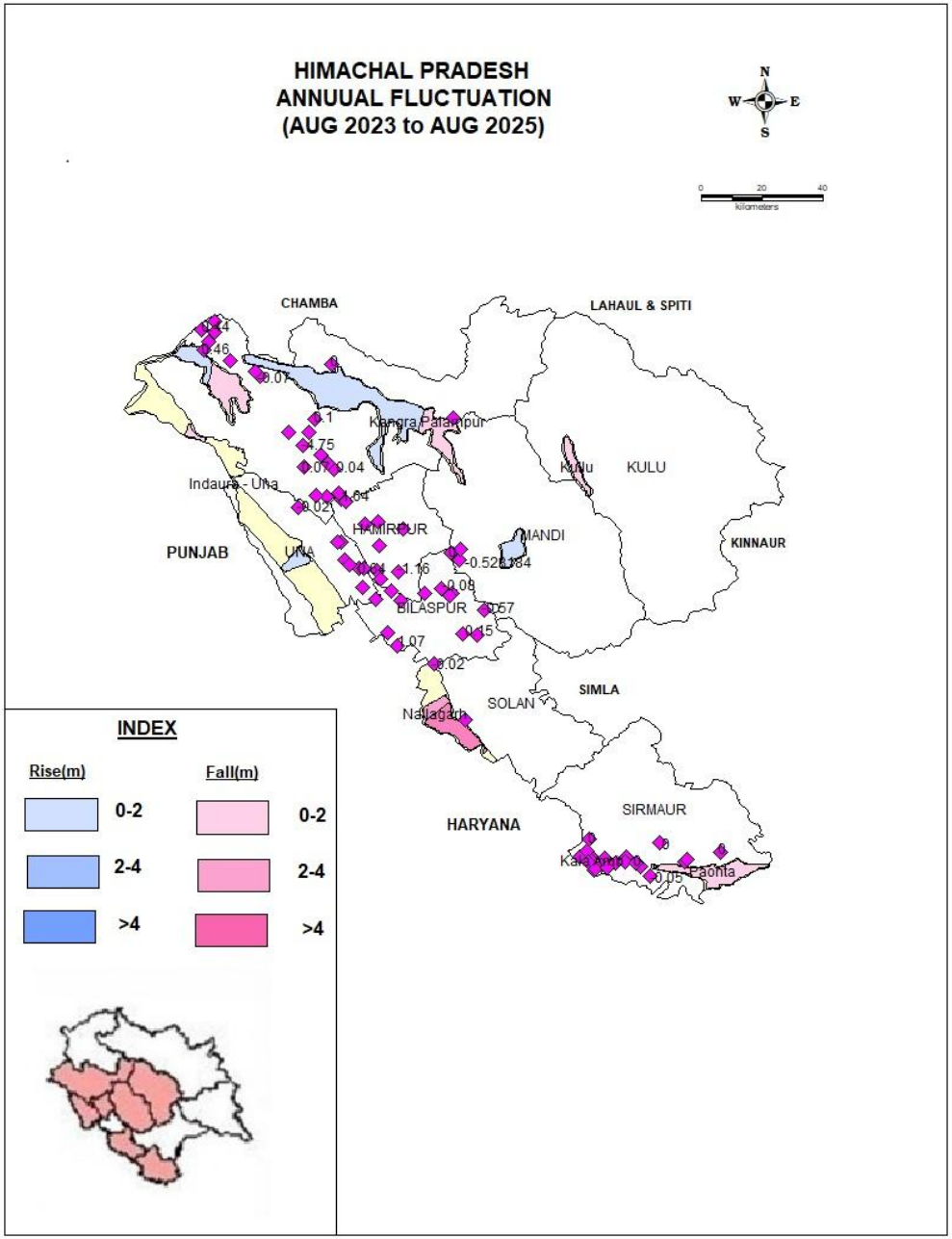


Fig:3 Annual fluctuations for the period Aug 2023 – Aug 2025

Aug 2024 to Aug 2025

Annual fluctuation of water level, has been worked out by comparing depth to water level of Aug 2024, with Aug 2025 and the data presented its frequency distribution in various rise and fall ranges.

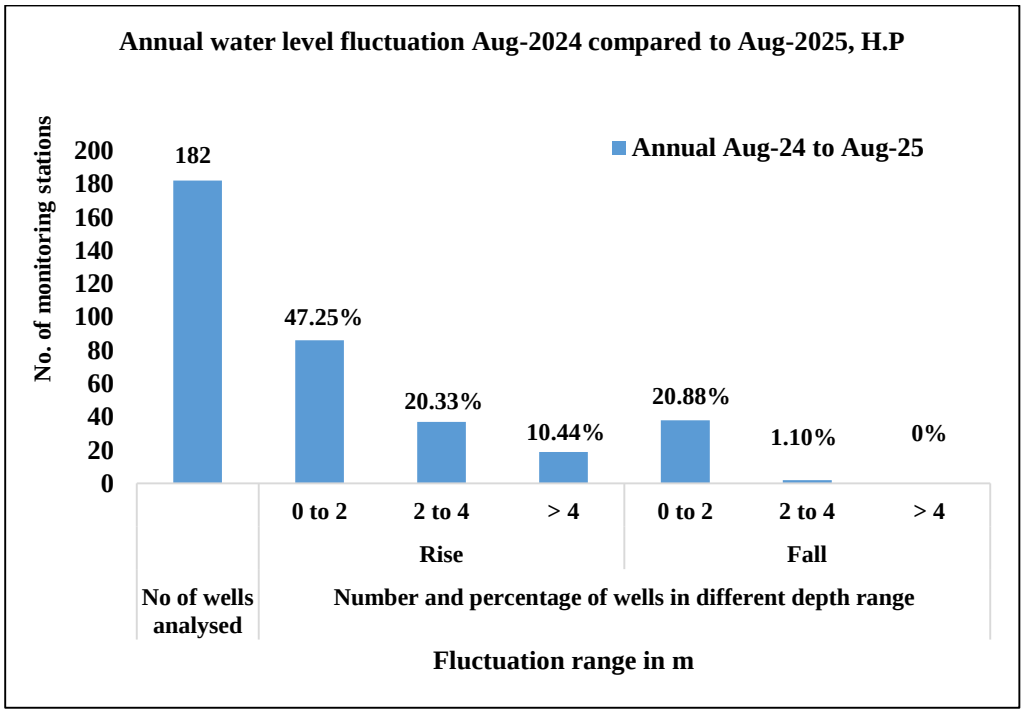
Out of the 182 stations analysed, 142 stations (78.02%) have shown rise in water level ranging from 0.02 (Kangra District) to 30.07 m (Sapri (Pz) Kangra District).

Out of 142 stations which have shown rise in water level, 86 stations show rise between the range of 0 to 2 m, 37 station has shown rise between 2 to 4 m and 19 station shown rise more than 4 m.

Similarly, for 40 stations which have shown fall in water level, 38 stations show fall between the range of 0 to 2 m, 2 stations have shown fall between 2 to 4 m and 0 stations has shown fall more than 4 m.

A perusal of map of Annual Water Level Fluctuation for August 2024 to August 2025 shows fall in water level in all the monitoring areas including Kangra Palampur valley, of Indora-Nurpur valley, Nallagarh valley, Kullu valley and of Una valley. Areas are showing water level rise in small parts of Paonta valley, kangra palampur valley and Nurpur Indora valley.

Comparison	Season	No of wells analysed	Number and percentage of wells in different depth range											
			Rise						Fall					
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%
Annual	Aug-24 to Aug 25	182	86	47.25	37	20.33	19	10.44	38	20.88	2	1.10	0	0



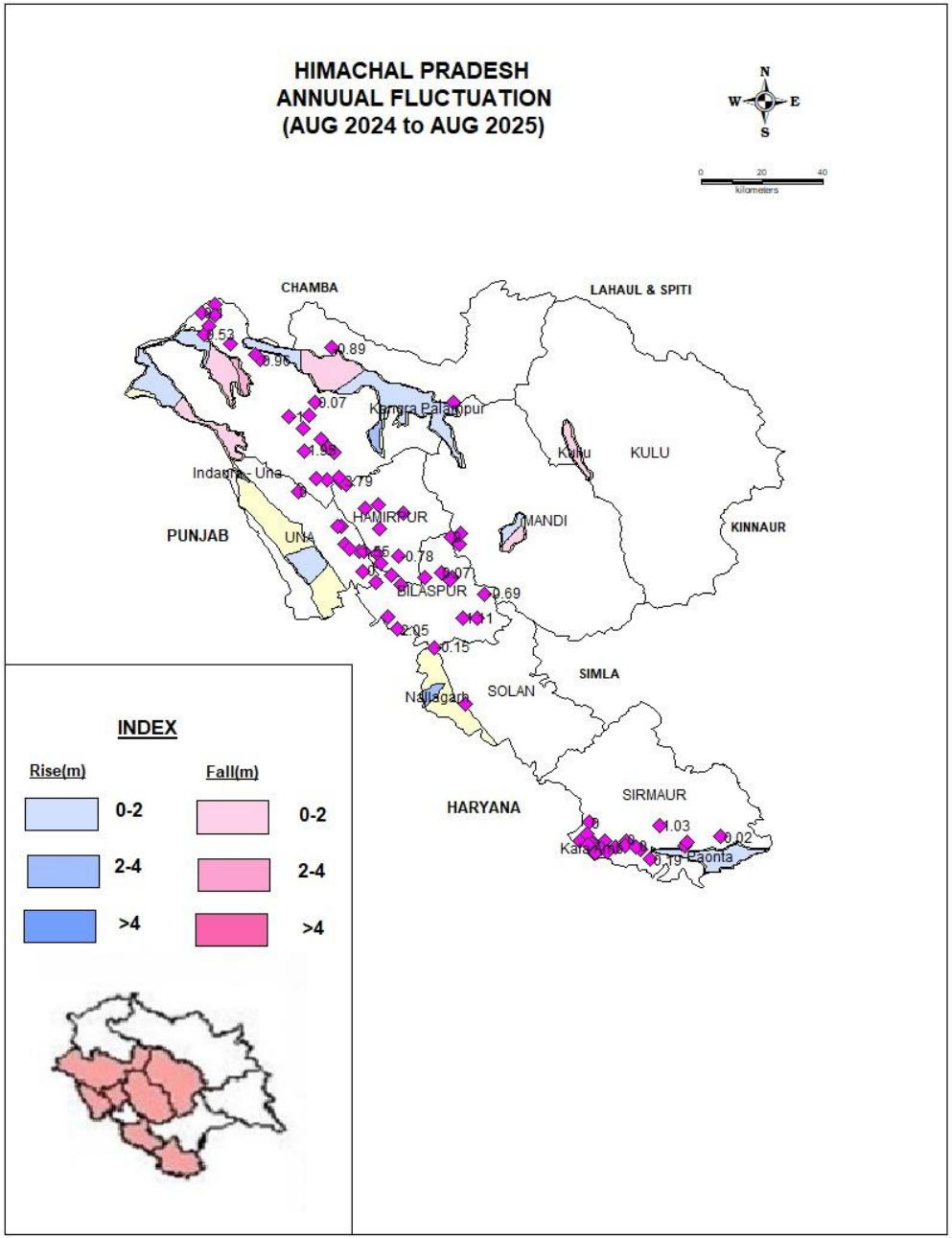


Fig:4 Annual fluctuations for the period Aug 2024 – Aug 2025

DECADAL FLUCTUATIONS

The decadal variations were analyzed considering the decadal average of water level and the water level for the respective period.

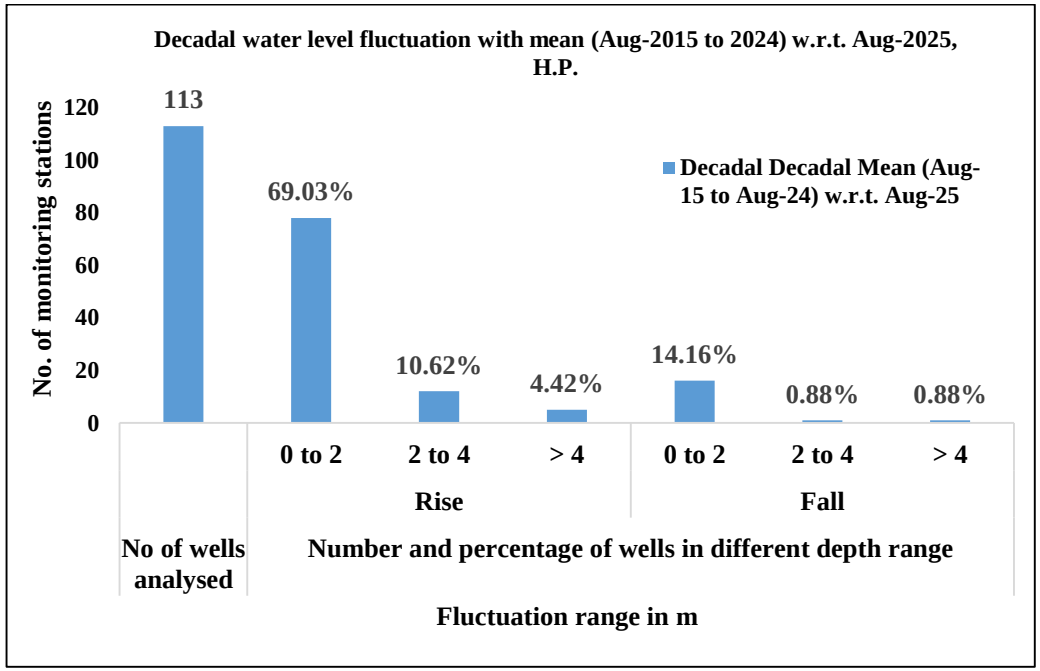
Decadal average of Aug (2015-2024) to Aug 2025

Decadal water level fluctuation has been worked out by comparing water level data of Aug 2025 with the average mean of 10 years' water level data of Aug (2015-2024) and is presented frequency distribution in various ranges.

A perusal shows that out of 113 stations analyzed, 95 stations (84.07%) have shown rise and 18 stations (15.93%), have shown fall in water level. Out of 95 stations 78 stations are showing rise in water level between 0 to 2 m, 12 stations between 2 to 4 m and 5 stations, more than 4 m. Out of 18 stations, 16 stations show fall in water level between 0 to 2 m, 1 station between 2 to 4 m and 1 station more than 4 m. A minimum rise in water level of 0.021 m was noticed in Una Districts and the maximum rise of 18.90 m is noticed in Una District. Similarly, the minimum fall of 0.069 m is noticed in Chamba District & maximum fall of 6.18 m is noticed in Kangra District.

A perusal of map Decadal Average of August (2015 - 2024) to August 2025 shows fall in water level majority areas of all the valley areas, except a few places in all valleys which are showing rise. Fall is shown in Nurpur and Indora valley, complete Kullu Valley and Balh valley of Mandi District, central part of Una valley of Una District, some part of Chauntra valley of Mandi District and north central part of Kangra Palampur valley of Kangra District. Fall in water level, >4 m is shown in Kangra and Solan District. Similarly rise in water level is noticed in Nalagarh Valley, Eastern part of Kangra Palampur valley of Kangra District.

Comparison	Season	No of wells analysed	Number and percentage of wells in different depth range											
			Rise						Fall					
			0 to 2	%	2 to 4	%	> 4	%	0 to 2	%	2 to 4	%	> 4	%
Decadal	Aug-25	113	78	69.03	12	10.62	5	4.42	16	14.16	1	0.88	1	0.88



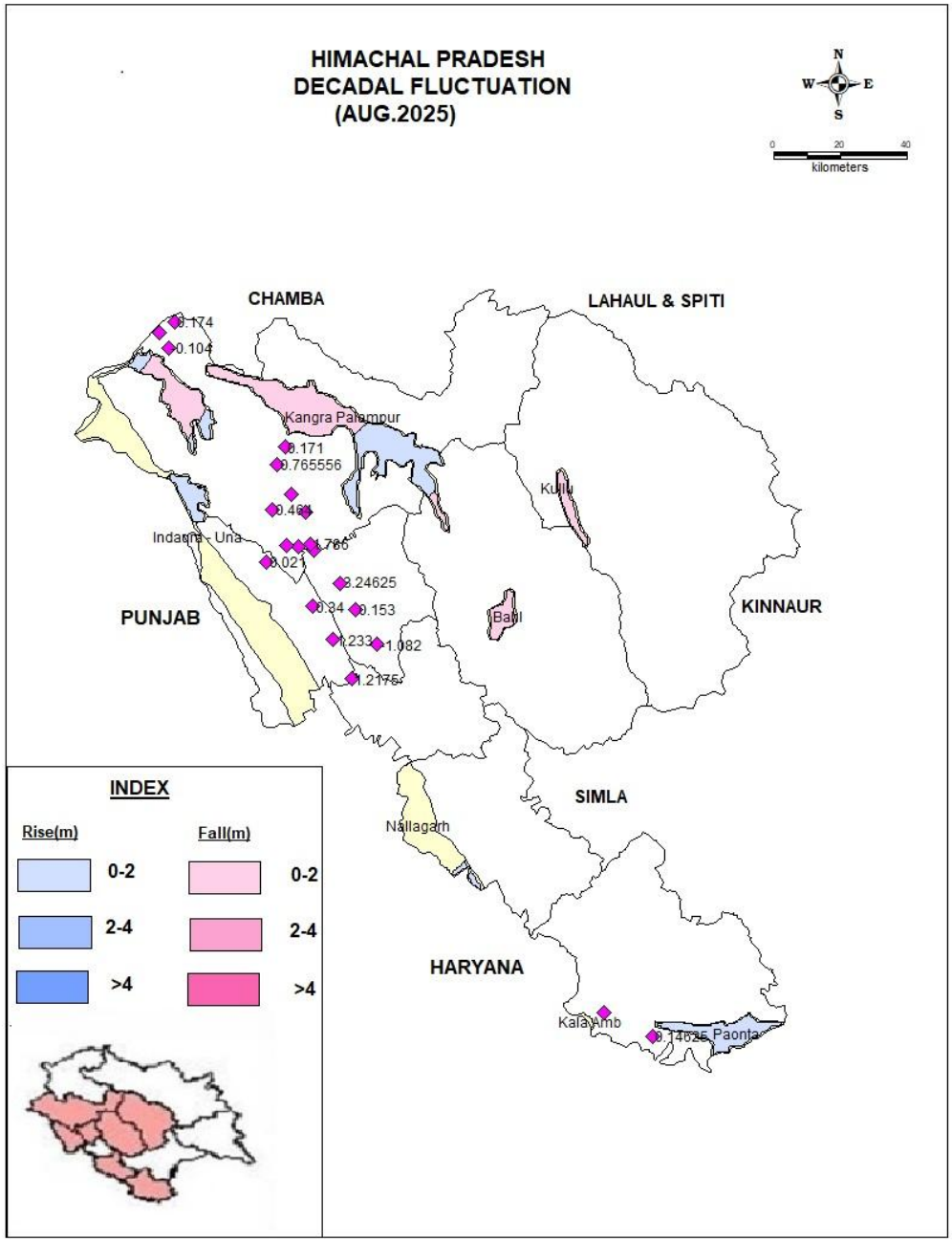


Fig. 5: Decadal water level fluctuation, Decadal mean Aug (2015-2024) Vs Aug-2025

SUMMARY

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In Aug 2025, around 89.11% of the state's area exhibited a depth to water level within 20 meters below ground level. Deeper water levels of more than 20 m cover 10.89 % area of the State covering mainly Una, Sirmaur,Solan, Kangra, districts.

Annual water level comparison with previous year Aug-2023 to Aug-2025 has shown that about 55.09% area of the state experienced rise in annual water and while comparison with Aug-2024 to Aug-2025 about 78.02% area of the state experienced rise in annual water level fluctuation. 84.07% of the area experienced rise in decadal mean water level of 2015-2024 with respect to Aug, 2025.

RECOMMENDATIONS:

Himachal Pradesh is one of the predominantly hilly state in India, which lies in the western Himalayas. Deeper water levels more than 20 m covers only 10.89 % area of the State, mainly in Una, Sirmaur,Solan and some valley parts of Kangra, districts. In such valleys of Districts where the water level goes deeper, artificial recharge structures are recommended, like a Check Dam and rain water harvesting.