सत्यमेव जयते
Goverment Of India

भारत सरकार
Government of India
जल शक्ति मंत्रालय
Ministry of Jal Shakti
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
Department of Water Resources
River Development and Ganga Rejuvenation
केंद्रीय भूमि जल बोर्ड
Central Ground Water Board

भूजल स्तर बुलेटिन, उत्तराखंड राज्य

नवंबर 2024

Groundwater Level Bulletin, Uttarakhand State

November 2024

1.0 INTRODUCTION

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

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

Groundwater levels are being measured by Central Ground Water Board four times a year during January, March/April/May, August and November. A network of 359 observation wells called **National Hydrograph Network Stations (NHNS)**, as on 30.05.2024, located all over the state is being monitored.

2.0 STUDY AREA

Uttarakhand State has a very diverse hydrogeological set-up. However, this hilly state can broadly be classified into two hydrogeological regimes namely Gangetic Alluvial Plain and Himalayan Mountain Belt.As per 2024 Groundwater resource assessment, Total Annual Ground Water Recharge of the State has been assessed as 2.14 bcm and Annual Extractable Ground Water Resource is 1.964 bcm. The Total Current Annual Ground Water extraction is 1.05 bcm and Stage of Ground Water extraction is 53.54 %.

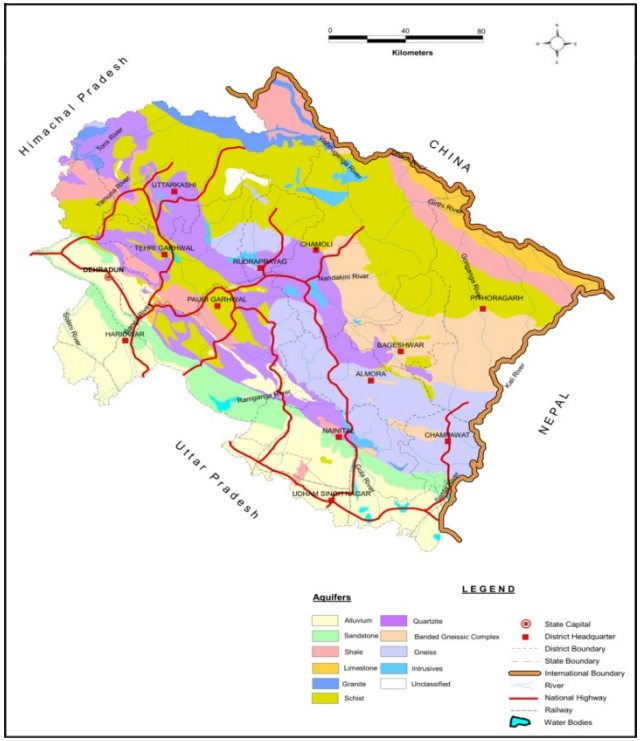

Fig.1 : Map showing disposition of principal aquifers of Uttarakhand State

The hydrogeology of Uttarakhand is related to geology and physiography. Variable hydrogeological conditions exist in the state due to a wide variation in the geology and land forms. The regional hydrogeological setup can be described on the basis of five hydrogeological units from north to south. (i)

Himalayan Region, (ii) Sub-Himalayan Region, (iii) Bhabhar Zone, (iv) Tarai Zone and (v) Central Ganga Plain. The Disposition of Principle Aquifer system of Uttarakhand State is given in the Fig. (1).

3.0 GROUND WATER LEVEL MONITORING

CentralGroundWaterBoard,UttaranchalRegion,is monitoringchangesingroundwaterregimeinUttarakhandstateonquarterlybasiscontinuously.This is facilitated by a network of monitoring stations in the State located indiverse hydrogeological and geomorphic units. The number of operationalwellstillMay2024was 359whichinclude40 dugwells, 194 Handpumps, 109 Springs, 4 deep aquifer tubewellsand12piezometers.

Table 1: district-wise number of monitoring stations

District	Number of Stations				
	DW	PZ	HP	Spring	TW
Dehradun	16	3	35	4	2
Haridwar	13	1	29	0	1
US Nagar	7	8	39	0	0
Pauri Garhwal	0	0	13	7	0
Tehri Garhwal	0	0	12	8	0
Nainital	3	0	14	7	1
Almora	0	0	11	27	0
Pithoragarh	0	0	7	9	0
Bageshwar	0	0	5	10	0
Chamoli	0	0	8	16	0
Rudraprayag	0	0	2	8	0
Champawat	1	0	9	6	0
Uttarkashi	0	0	10	7	0

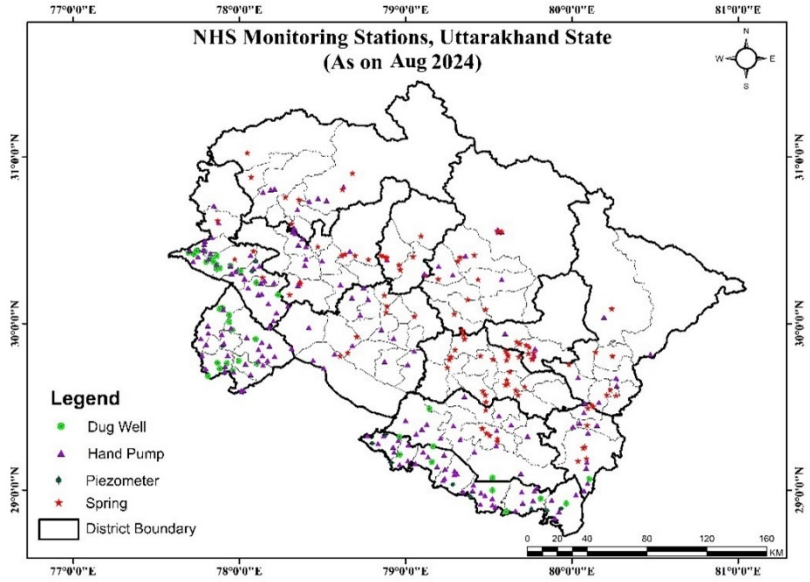

Fig.2: NHS monitoring stations of Uttarakhand State, as on November,2024

4.0 GROUND WATER LEVEL SCENARIO

4.1 Depth to Water level (Nov 2024)

The depth to water level of 231 wells is used for the analysis. Analysis ofdepth to water level data of 231 wells shows water levels vary between 0.03m bgl (Haridwar district) to 94.58 m bgl (Pauri Garhwal district). Water level of less than 5 m bgl is recorded in 25.54 % of wells, between 5 to 10 m bgl in 25.54% of wells,between 10 to 15 m bgl in 11.69% of wells, between 15 to 30 m bgl in 21.21 % ofwells,between30-50mbglin9.52%ofwellsandwaterlevelmorethan50mbglis registered in6.49%of wells.

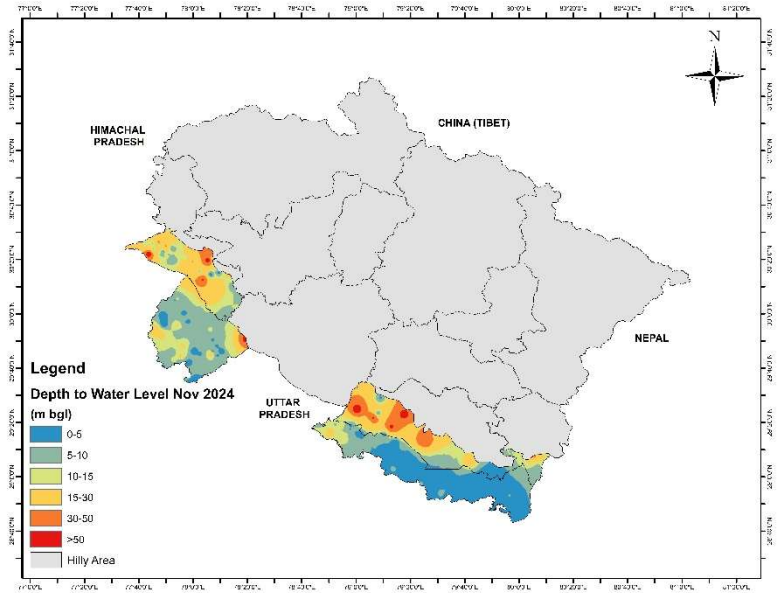

Fig.3: Depth to Water level Map(Nov 2024), Uttarakhand State

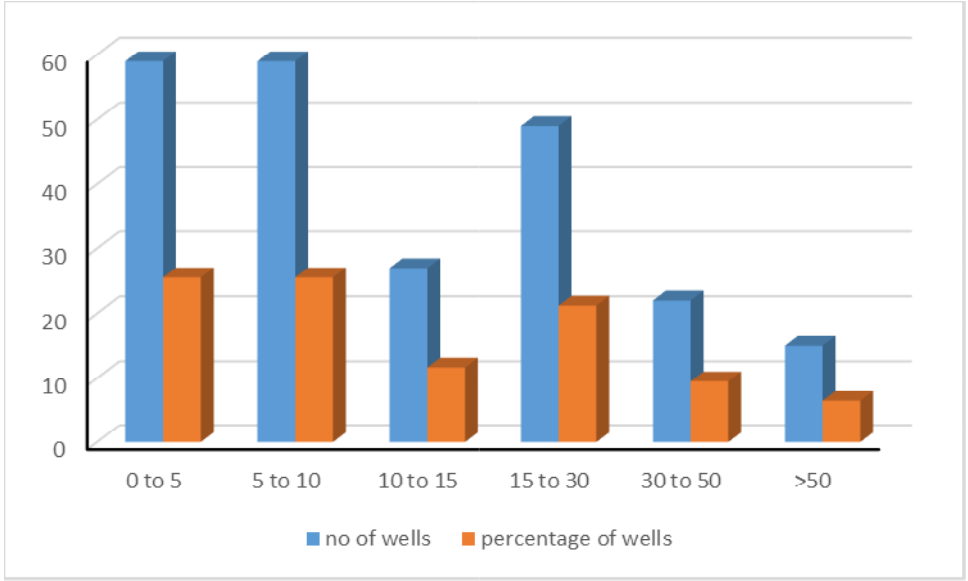

Fig.4: Percentage of wells in different water level range

4.2 Fluctuation in Water level in past 03 years (Nov 2021 to Nov 2023 Vs Nov 2024)

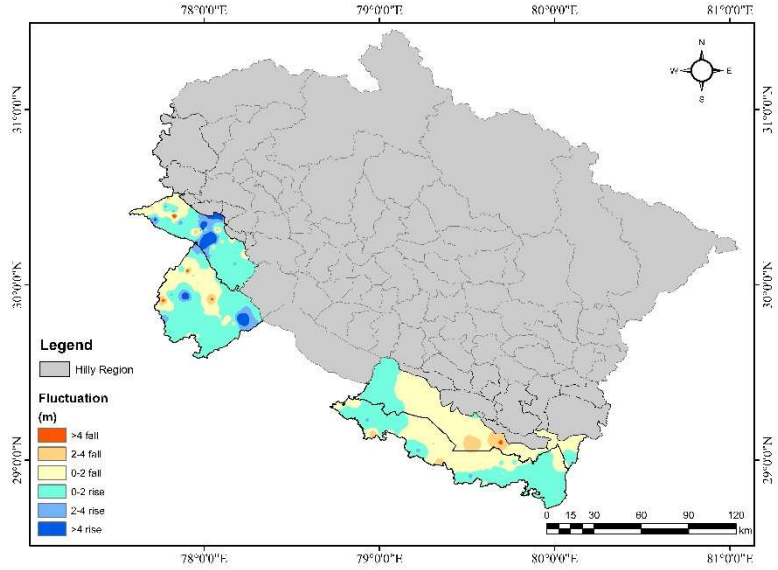

Fig. 5: Fluctuation in water level (Nov 2021 to Nov 2023 Vs Nov 2024)

Rise in Water level:

Out of 161 wells, 92 wells (57.14% of total wells) are showing rise in water level in Aug 2024 when compared with last three years monsoon water level data. Out of 144 wells, 37.27 % of the wells showing rise in the range of 0-2 m, 11.80 % of wells ahowing rise in the range of 2-4 m while, only 13 wells (8.07% of the total) showing rise greater than 4 m. Rise of more than 4 m is mainly observed in the eastern most flank of Haridwar district and in a small patches in the Raipur block of the Dehradun district.

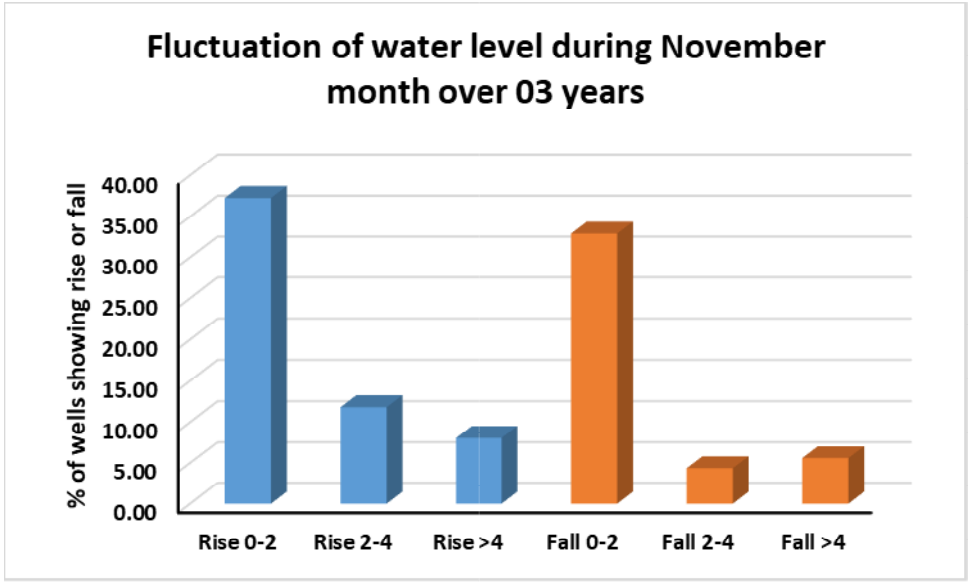

Fig. 6: Percentage of wells showing different fluctuation range in last three years

Fall in Water level:

Out of 161 wells, 69 wells (42.86% of total wells) are showing fall in water level in August 2024 when compared with last three years monsoon water level data. Out of 161 wells, 32.92 % of the wells showing fall in the range of 0-2 m, 4.35 % of wells showing fall in the range of 2-4 m while, only 09 wells (5.59% of the total) showing fall greater than 4 m. Rise in the range of 0-2 m is being observed in the major part of the Kumaon Region cover major area of Dehradun Valley, and Haridwar district, while major area of the Garhwal Region (Udham Singh Nagar district, Champawat district and Nainital district) showing fall in the range of 0-2 m.

4.3 Decadal Fluctuation in Water level (Nov 2014 to Nov 2023 Vs Nov 2024)

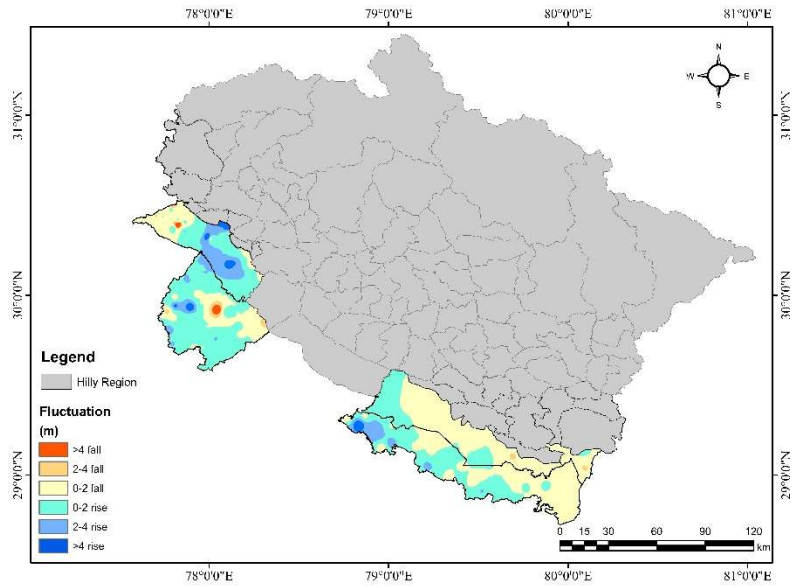

Fig. 7: Decadal Fluctuation in water level (Nov 2014 to Nov 2023 Vs Nov 2024)

Rise in Water level:

Out of 117 wells, 62 wells (~53% of total wells) are showing rise in water level in August 2024 when compared with last 10 years (2014-2023) monsoon water level data. Out of 117 wells, 34.19 % of the wells showing rise in the range of 0-2 m, 10.26 % of wells showing rise in the range of 2-4 m while, only 10 wells (8.55% of the total) showing rise greater than 4 m.

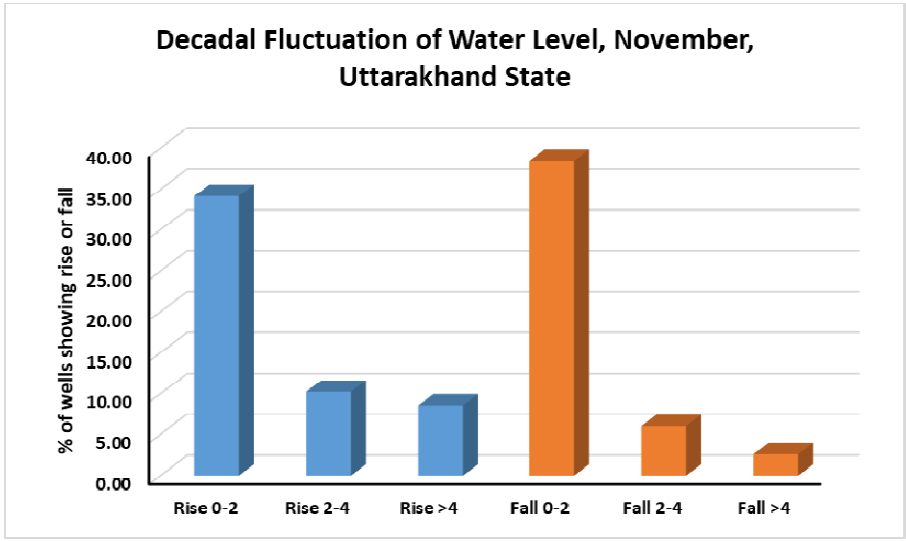

Fig. 8: Percentage of wells showing different decadal fluctuation range

Fall in Water level:

Out of 117 wells, 55 wells (47% of total wells) are showing fall in water level in August 2024 when compared with last last 10 years (2014-2023) monsoon water level data. Out of 117 wells, 38.46 % of the wells showing fall in the range of 0-2 m, 5.98 % of wells showing fall in the range of 2-4 m, while 03 wells (2.56% of the total) showing fall greater than 4 m. Fall in the range of 0-2 m is being observed in the major part of the state cover major area of Dehradun Valley, Udham Singh Nagar district, Champawat district and Nainital district.

4.4 Measurement of Spring discharge in the Hilly Regions

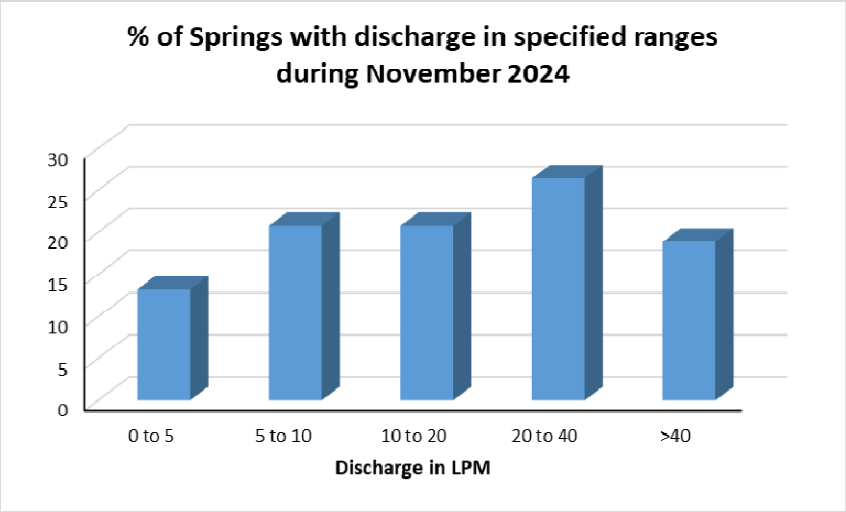

Fig.9: Percentage of Spring with discharge (in lpm) in specified range, Uttarakhand State

Total 106 numbers of Springs were measured for their discharge (in lpm) in Uttarakhand State in the month of November 2024. Out of 106 numbers of measured springs, 13.21% (14 numbers out of 106) were showing discharge in the range of 0-5 lpm, 20.75% (22 springs) were showing discharge in the range of 5-10 lpm, 20.75% (22 springs) were showing discharges in the range of 10-20 lpm, 26.42 % (28 springs) were showing discharge in the range of 20-40 lpm and 20 springs out of 106 (i.e. 18.87% of the total) were showing discharge more than 40 lpm. Minimum discharge of 0.66 lpm was observed in the Joshimath Spring of Chamoli district while Maximum discharge of 527.93 lpm was observed in the Nauganga spring of Chamoli district during the November 2024.

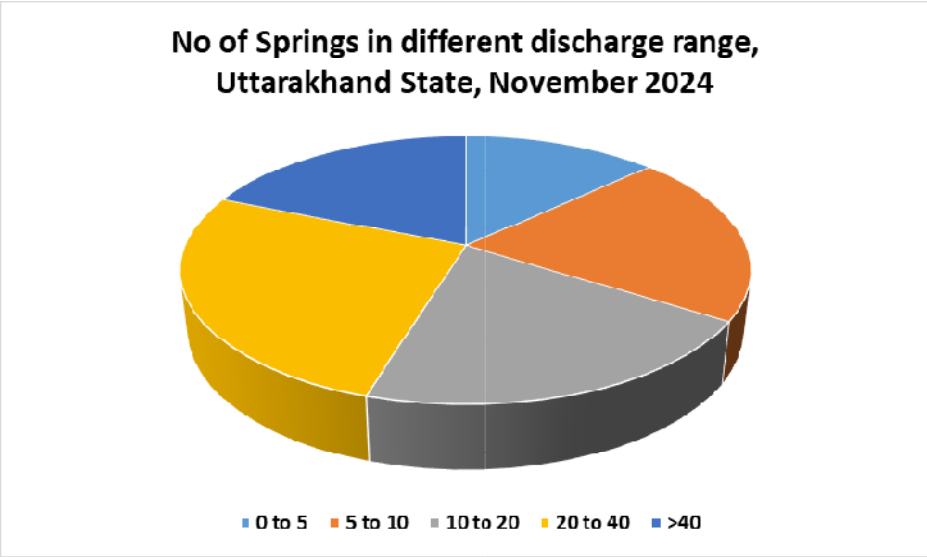

Fig.10: Number of Spring with discharge (in lpm) in specified range, Uttarakhand State

54% of the springs were showing decline in discharge during November 2024 when compared with November 2023. Minimum decline in discharge is 0.37 lpm and maximum decline in discharge is observed as 59.33 lpm. 46% of the total springs were showing rise in the discharge during November 2024 when compared with November 2023. Minimum increase in the discharge is observed as 0.02 lpm and maximum discharge is observed as 71.75 lpm.

जारीकर्ता

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