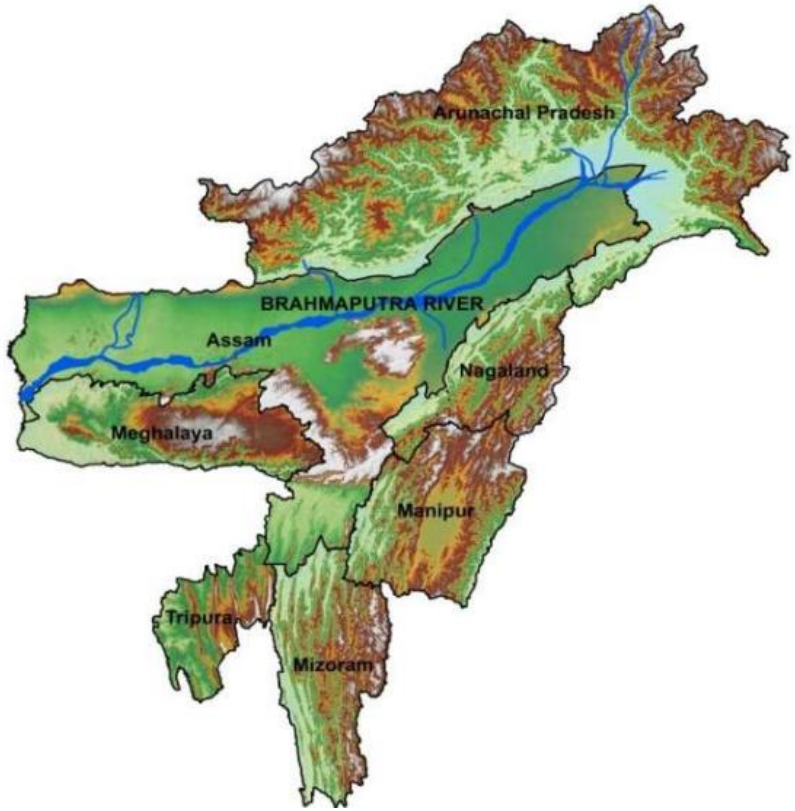
GROUND WATER LEVEL BULLETIN

NOVEMBER 2024

NORTH EASTERN STATES



Issued by

Central Ground Water Board

North Eastern Region, Guwahati

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, 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.

2.0 STUDY AREA

The North-Eastern Region (NER) of India comprise a unique agglomeration, with a diversified geological set-up. The spectacular physiographic set up includes the stunning Himalayan mountain belt in the North, the Indo-Myanmar Range in the east and the mighty Brahmaputra, forming the extensive Assam plains. North-Eastern India, comprising seven states of the Indian Union, viz, Assam, Arunachal, Meghalaya, Nagaland, Mizoram, Manipur and Tripura, geologically represents a collage of different tectonic blocks with distinctive geological history.

The Region represents varied, geomorphological and geological setup which is ranging from Precambrian to Recent age. It is manifested by spectacular Himalayan Mountain Belt in the north; Shillong Massif Plateau in the south and mighty Brahmaputra forming the extensive Assam plain in between and Indo-Myanmar Range in the east.The central part of the terrain constitutes the Shillong–Mikir Precambrian massif (Meghalaya plateau and Mikir Hills of Assam), representing the north-eastern continuation of the Chhotanagpur Gneissic Complex (CGC) across the Bengal Basin (Ganges–Brahmaputra valley). The Dauki Fault demarcates the southern boundary of the plateau, while the northern and eastern edges are covered by alluvials of the Brahmaputra river valley in the Assam plains. Several inselbergs of the basement jut out in the Brahmaputra alluvial plains, of which those at Goalpara and Dhubri are the most prominent. The eastern most segment of the Himalaya including the ‘Eastern Himalayan Syntaxis’ (occupying Arunachal Pradesh) and the Indo-Burman Range (IBR) passing through Nagaland–Manipur, binds the region along its north and east. Along the west of the IBR, there are N–S to NE–SW trending Neogene molasse sediments of shelf facies, the southern parts of which make up the low hill ranges of Tripura–Mizoram. The Bengal Basin (Rajmahal–Garo Hills gap) intervenes between the Indian Peninsular shield and the

North-Eastern region, though with uninterrupted continuation of the Himalayan Range along the northern territory.

Hydrogeologically, the area is grouped into porous and fissured formations based on the nature of openings in the aquifer system. Alluvium and sedimentary formations and fissured consolidated rocks form the main repositories of ground water. As per 2023 Groundwater resource assessment, Total Annual Ground Water Recharge of the State has been assessed as 36.37bcm and Annual Extractable Ground Water Resource is 28.85 bcm. The Total Current Annual Ground Water extraction is 2.89 bcm and Stage of Ground Water extraction is 10 %.

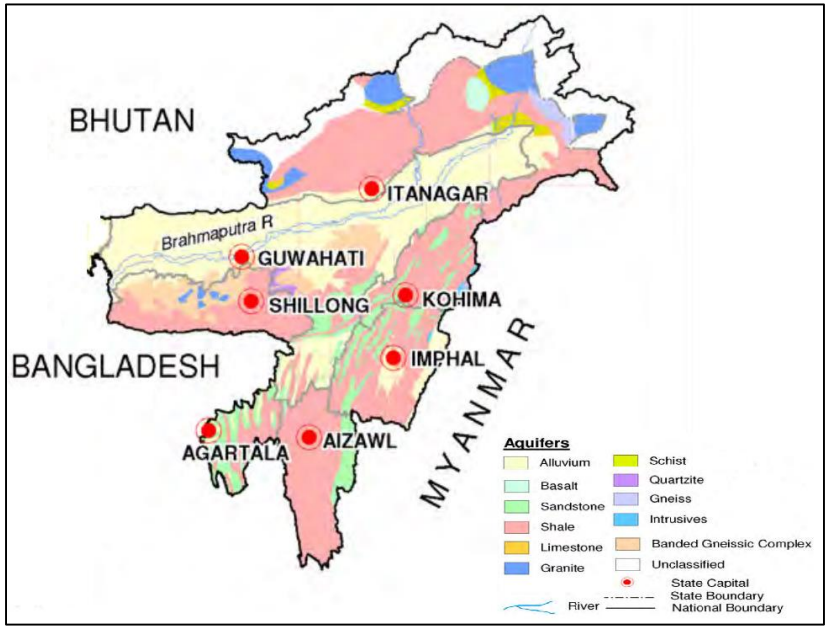


Fig.1 : Map showing disposition of principal aquifers of NE States

3.0 GROUND WATER LEVEL MONITORING

Central Ground Water Board, North Eastern Region, is monitoring changes in ground water regime in the states on quarterly basis continuously. This is facilitated by a network of monitoring stations in the State located indiverse hydrogeological and geomorphic units. The numbers of monitoring stations till November 2024 is 888 of which 695 are dug wells, 123 are Piezometers & 70 are springs.

Table 1: State wise number of monitoring stations

Sl. No.	State	Existing Monitoring NHNS station as on November 2024			Total
		Dug well	Piezometer	Springs	
1	Arunachal Pradesh	27	4	28	59
2	Assam	392	90	0	482
3	Manipur	4	0	2	6
4	Meghalaya	69	13	19	101
5	Mizoram	3	0	0	3
6	Nagaland	102	1	21	124
7	Tripura	98	15	0	113
	Total	695	123	70	888

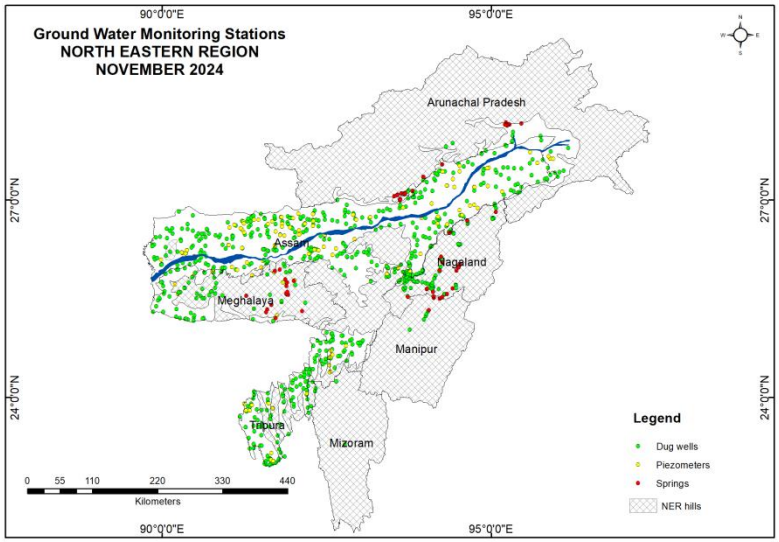


Fig.2: NHS monitoring stations of NE States, as on November, 2024

4.0 GROUND WATER LEVEL SCENARIO

4.1 Depth to Water level (November 2024)

Arunachal Pradesh

A total 28 wells were analysed for the depth to water level range of November 2024. Water level between 0-2 m bgl recorded in 35.71% (10 wells) of wells, between 2 to 5 m bgl in 42.86% (12 wells) of wells, between 5 to 10 m bgl in 17.86% (5 wells) of wells and between 10 to 20 m bgl in only 1 dug well in Papum Pare district. Minimum water level if -0.56mbgl and maximum of 10.02mbgl is recorded both from Papum Pare district.

Assam

A total of 408 wells were monitored in November 2024 and used for analysis of depth to water level in Assam. Water level between 0-2 m bgl recorded in 47.06% (192) of wells, between 2 to 5 m bgl in 39.22% (160) of wells, between 5 to 10 m bgl in 10.78% (44) of wells, between 10 to 20 m bgl in 2.70% (11) of well and one well have water level >20mbgl. Minimum water level of -0.19mbgl is recorded from Karimganj district and maximum water level of 20.71mbgl is recorded from East Karbi Anglong district.

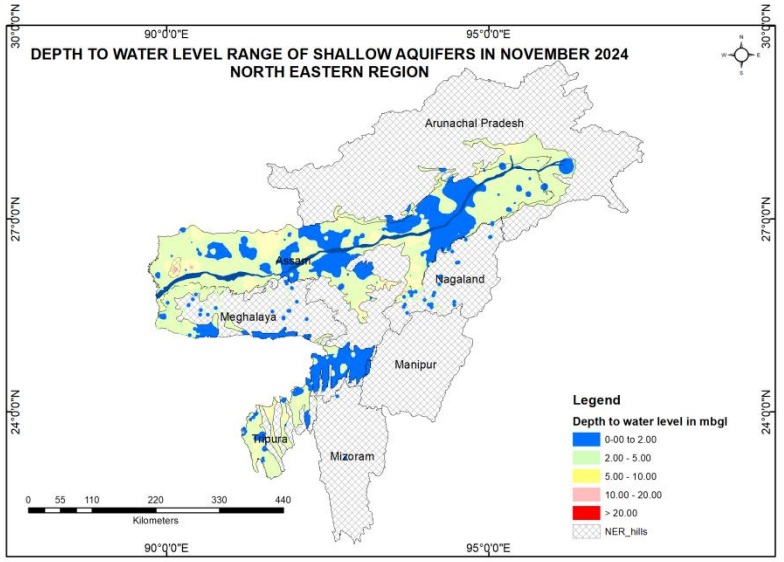


Fig.3: Depth to Water level Map (Nov 2024), NE States

Manipur

The state of Manipur has four dugwell stations all in Senapati district, out of which 1 well has water level in 0-2m range and 3 wells in 2-5m range.

Meghalaya

In Meghalaya state 81 wells were monitored and anlysed for November 2024. In the range of 0-2m there were 34.57% (28) of

wells, 50.62% (41) of wells in 2-5m, 8.64% (7) wells fall in 5-10m range of water level, one well in 10-20m range and four wells, two each from Ri Bhoi district and West Garo Hills district in >20m range. Minimum water level of 0.2mbgl from Ri Bhoi district and maximum water level of 45.62mbgl from West Garo Hills district is recorded for November 2024.

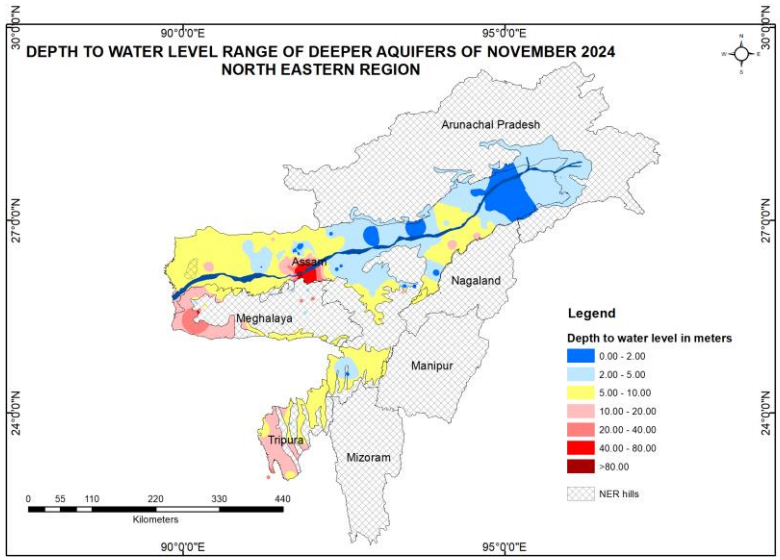


Fig.4: Depth to Water level Map of Deeper aquifers (Nov 2024), NE States

Mizoram

Mizoram has 3 dugwells, on each in Kolasib, Mamit and Serchip districts. Wells at Kolasib and Serchip has water level in 0-2m range and the well in Mamit has water level in 2-5m range.

Nagaland

In Nagaland 96 dugwells were monitored and analysed. Out of which 34.38% (33) stations are in 0-2m range, 38.54% (37) wells in 2-5m range, 21.88% (21) wells in 5-10m range, three wells have water level in 10-20m range and one well in >20m range. Minimum water level of 0.16mbgl is recorded from Kohima and maximum water level of 18.91mbgl is recorded from Dimapur district.

Tripura

The depth to water level of 102 wells were monitored and analysed for Tripura in November 2024. In these stations water level in the range of 0-2m is recorded in 34.31% (35) stations, 2-5m range in 50.00% (51) stations, 5-10m range in 11.76% (12) stations, 2.94% (3) well recorded water level in 10-20m range and one well has >20m range. Minimum water level of 0.16mbgl from Gomati district and maximum water level of 26.22mbgl from West Tripura is recorded for November 2024.

Seasonal Fluctuation in Water level (March 2024 Vs Nov 2024)

Arunachal Pradesh

Total 26 stations were analysed for November 2024 with respect to March 2024. Out of 26 wells, 5 wells (19.23% of total wells) are showing fall in water level and 21 wells (80.77% of total wells) are showing rise in November 2024 when compared with March 2024 water level data. All 5 wells are showing fall in the range of 0-2 m. Out of the 21stations showing rising trend, 18 wells (69.23% of the total) are showing rise in the range of 0-2m, 2 stations show rise in 2-4m range and one station have rise in > 4 m range. Rise of more than 4 m is mainly observed in the Lower Subansiri district district.

Assam

In Assam a total of 352 stations were anlysed, out of which 91.76% (323) stations show rising trend and 8.24% (29) stations show

falling. Out of the 323 stations, 72.16% (254) stations have rise in 0-2m range, 15.06% (53) stations have rise in 2-4m range and 4.55% (16) stations have rise in >4m range. Fall in the 0-2m range was recorded in 6.82% (24) stations, 2-4m in 0.85% (3) stations and two stations from Baksa and Nalbari districts show fall in >4m range. Rise of >4m range is recorded from Baksa, Cachar, Charaideo, Dhubri, East Karbi Anglong, Golaghat, Hailakndi, Hojai, Kamrup, Kokrajhar, Morigaon and Nagaon District.

Manipur

Monitoring of four stations is going on only in Senapati district of Manipur. Out of the three stations showing rise as compared to March 2024 water level datal, all of them have rise in 0-2m range. One station showing fall is also in 0-2m range.

Meghalaya

A total of 81 stations were analysed in meghalaya for November 2024 for seasonal fluctuation w.r.t. March 2024. Out of the 81 stations, 69 (85.19%) stations have rise and only 12 (14.81%) stations show falling trend. Rise in the range of 0-2m range is recorded in 62 (76.547%) stations, 2-4m range in 3 (3.70%) stations and 4 (4.94%) stations have rise in >4m range. Fall all 12 (14.81%) station is in the range of 0-2m. Rise of >4m is recorded in East Khasi Hills and Ri Bhoi districts.

Mizoram

Two wells were analysed for Mizoram state, one each in Kolasib and Serchip district. The well in Kolasib district show rise in 0-2m range and the well in Serchip show fall in 0-2m range.

Nagaland

Seasonal fluctuation of 92 station were analysed in Nagaland state, out of which 64 (69.57%) stations show rise and 28 (30.43%) stations show falling trend. Rise in the range of 0-2m is recorded in 43 (46.74%) stations, 2-4m in 15 (16.30%) stations and 6 (6.52%) stations have rise in >4m range. Fall in 0-2m rnage is recorded in 20 (21.74%) stations and 8 (8.70%) stations in 2-4m range. Rise of >4m is recorded from Chumukedima,, Dimapur, and Kohima district.

Tripura

Out of 96 wells analysed for seasonal fluctutaion with respect to March 2024, 88 wells (91.67% of total wells) are showing rise and only 8 wells (8.33%) are showing fall in water level. Out of 88 wells, 63 (65.63%) of the wells are showing rise in the range of 0-2 m, 18 wells (18.75%) are showing rise in the range of 2-4 m while, 7 wells (7.29%) are showing rise in more than 4 m range. Fall is recorded in 6 (6.25%) stations in the range of 0-2m and one well each in 2-4m and >4m range. Rise in the range of >4 m is being observed in the districts of Sipahijhala, South Tripura, Unakoti and West Tripura. Fall of more than 4m is recorded from Khowai district.

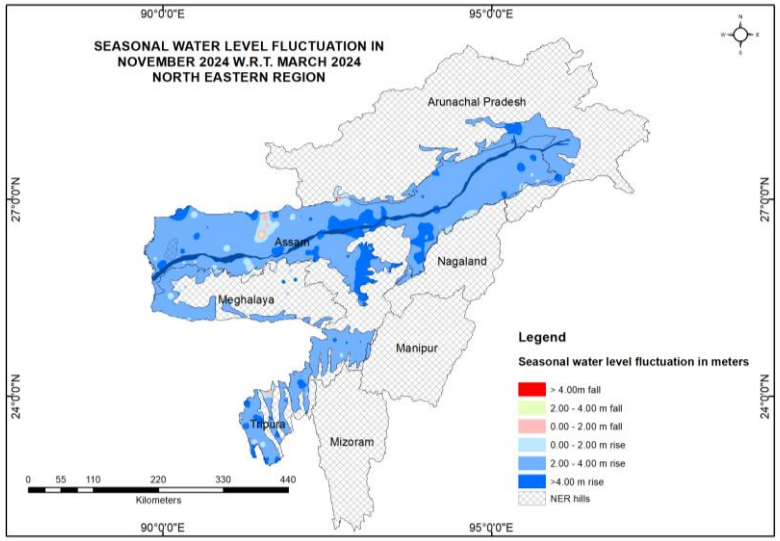


Fig. 5: Seasonal Fluctuation in water level (Mar 2024 Vs Nov 2024)

4.2 Annual Fluctuation in Water level (Nov 2023 Vs Nov 2024)

Arunachal Pradesh

Comparison of November 2024 to November 2023 water level data was done for 26 stations in Arunachal Pradesh. Fall and rise was recorded in 8 (30.77%) stations and 18 (69.23%) stations respectively. Rise in the range of 0-2m was recorded in 15 (57.69%) stations, two stations in 2-4m and in one station in >4m range was recorded in the state. All 8 stations have fall in 0-2m range. Rise of >4m was recorded from Lower Dibang Valley district.

Assam

A total of 299 stations were analysed for Assam in November 2024 with respect to November 2023, out of which 199 (66.56%) stations show rise and 100 (33.44%) stations show fall in water level. Fall in the range of 0-2m range is recorded in 82 (27.42%) stations, 2-4m range in 12 (4.01%) stations and 6 (2.01%) stations have water level fall in >4m range. Fall of >4m range is recorded from Baksa, Dhubri, East Karbi Anglong and Nalbari districts. Rise in the range of 0-2m range is recorded in 178 (59.53%) stations, 2-4m in 16 (5.35%) stations and >4m range in 5 (1.67%) stations of the state. Rise of >4m range is recorded in districts of Dhubri, East Karbi Anglong, Morigaon and Sibsagar districts.

Meghalaya

In Meghalaya 73 stations were analysed, out of which 15 (20.55%) stations are showing rising and 58 (79.45%) stations are showing falling in water level in November 2024 w.r.t. November 2023. All of the 15 stations showing rise are in the tange of 0-2m. Fall in the range of 0-2m is recorded in 57 (78.08%) stations, and one station have fall in 2-4m range from West Garo Hills district.

Mizoram

Two stations were analysed in Mizoram, one each in Kolasib and Serchip districts. The well at Kolasib show rise in 0-2m range and the well at Serchip district also have water level fall also in 0-2m range.

Nagaland

Wells only in the district of Dimapur is analysed for seasonal fluctutation of Nov 24 with respect to November 2023, where 5 stations show rise and 4 stations show fall in water level. Rise in the range of 0-2m is recorded in 4 (44.44%) stations and in one station in 2-4m range. Fall in two stations each in 0-2m and >4m range is recorded for Novembner 2024.

Tripura

In Tripura state, 100 stations were analysed for November 2024 with respect to November 2023 water level, out of which 80 (80.00%) stations show rise and 20 (20.00%) stations show falling trend. Rise in the range of 0-2m is recorded in 72 (72.00%) stations, 2-4m in 6 (6.00%) stations and 2 stations from South Tripura district have rise in >4m range. Fall in the range of 0-2m range is recorded in 18 (18.00%) stations and two stations, one from Khowai district and thhe other from West Tripura district, have fall in the range of >4m range.

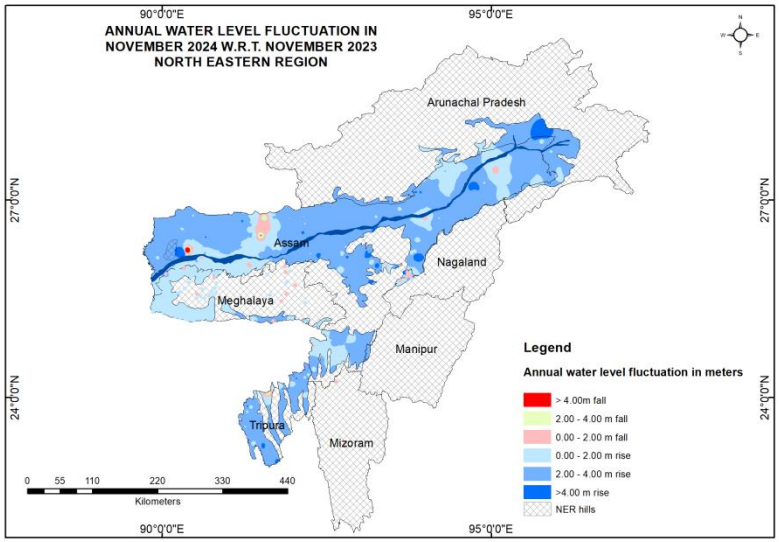


Fig. 6: Annual Fluctuation in water level (Nov 2023 Vs Nov 2024)

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

Arunachal Pradesh

In Arunachal Pradesh 19 stations were analysed for decadal postmnsoon flutctuation, out which 11 wells (57.89%) are showing rise in water level all in 0-2m range and the other 8 stations (42.11%) are showing fall in water level also in 0-2m range. Minimum and maximum rise of 0.03m and 1.72m is recordd from Lower Subansiri and Changland districts respectively. Minimum fall of 0.03m and maximum fall of 1.37m, both are recorded from East Siang district.

Assam

Decadal analyses of 220 stations of Assam show rise in 146 (66.36%) of wells and fall in 74 (33.64%) of wells in the state. Out of 146 wells showing rise, rise is recorded in 137 (62.27%) stations in 0-2m range, 8 (3.64%) stations in 2-4m range and one station have rise in >4m range. Majority of fall recorded in 0-2m range in 66 (30.00%) stations, 7 (3.18%) stations recorded fall in 2-4m range and one station recorded fall in >4m range. Minimum rise of 0.02m from Kokrajhar district and maximum rise of 6.13 from East Karbi Anglong district is recorded for November 2024. Minimum fall of 0.02m and maximum fall of 7.76m is recorded from Dibrugarh district and from East Karbi Anglong district respectively.

Meghalaya

Meghalaya state analysed 49 stations for November 2024 with respect to decadal mean wherein rise is recorded in 11 (22.45%) stations and fall is recorded in 38 (77.55%) stations. All the rise and fall in the stations are in 0-2m range. Minimum is 0.02m in North Garo Hills district and maximum rise of 1.62m recorded in Ri Bhoi district. Minimum fall of 0.04m from West Garo Hills district and maximum of 1.65m fall in East Garo Hills district respectively was recorded.

Nagaland

Decadal analysis of 12 wells in Dimapur district was only done for Nagaland state. Out of which 41.67% (5) stations have rise and 21.00% (7) stations have fall in the district. Out of 5 stations, 4 (33.33%) stations show rise in 0-2m range and one well >4m range. Out of the 7 stations, 4 (33.33%) stations show fall in 0-2m range, one in 2-4m range and 2 (16.67%) stations show fall in >4m range.

Tripura

In Tripura state, a total of 71 stations were analysed wherein 52 (73.24%) stations show rise and 19 (26.76%) stations show fall. Out of the 52 stations showing rising trend, 70.42% (50) stations show

rise in 0-2m range and 2.82% (2) stations show rise in 2-4m range. Out of the 19 stations showing falling trend, 16 (22.54%) stations have fall in 0-2m range, 2 stations have fall in 2-4m range and one station in >4m range.

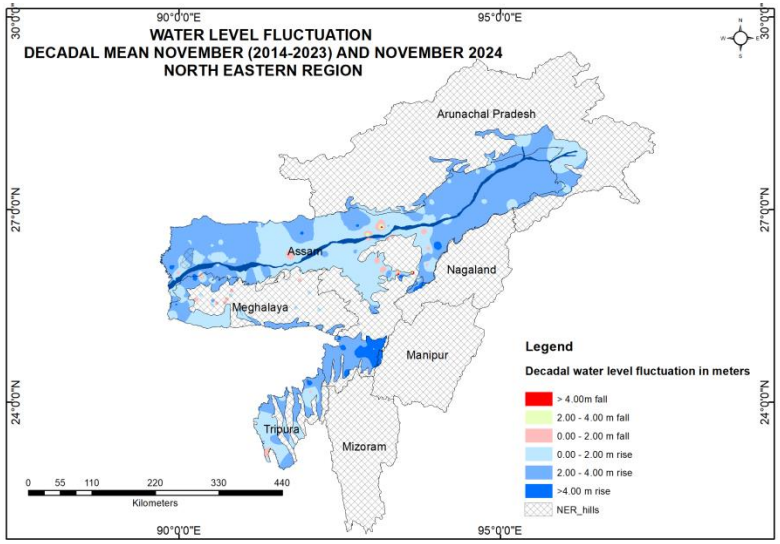


Fig. 7: Decadal Fluctuation in water level (Nov 2014 to Nov 2023 Vs Nov 2024)

4.4 Measurement of Spring discharge in the Hilly Regions

Arunachal Pradesh

In the state, 28 springs were inventoried in November 2024 for periodic monitoring during NHNS. During November 2024 all the springs have discharge within 1.0 lps.

Manipur

Two springs were monitored in Manipur both in Senapati district of Manipur in November 2024. The spring at Upper Kathikho had a discharge of 0.09 lps and on the other hand spring at Mao gate has a discharge of 0.79lps.

Meghalaya

A total 19 numbers of springs were measured for their discharge in four districts of Ri Bhoi, East Khasi Hills, West Khasi Hills and West Jaintia Hills district of Meghalaya State. Out of 19 numbers of measured springs, 89.47% (17 numbers) were showing discharge in the range of 0-2 lps, with a maximum of 1.82 lps reported from Tyrsad spring, East Khasi Hills. Two springs, one at Mawsynram and the other at Umshing Umjapung has discharge of7.82 lps and 10.12lps respectively.

Nagaland

All the 21 springs were monitored in Nagaland state have discharge in 0-2 lps range. Minimum discharge of 0.002lps is recorded from Khuwaboto in Zunheboto district and maximum of 1.08lps is recorded from Tzudok-dok Spring in Mokokchung district.

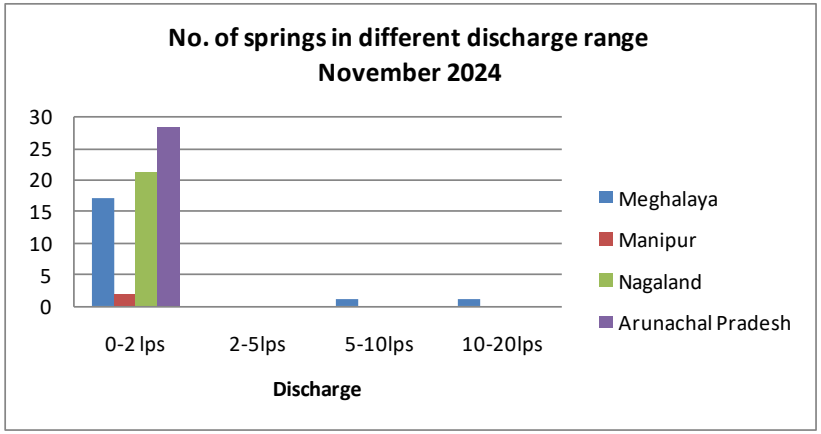


Fig.8: Number of Spring with discharge (in lps) in specified range.