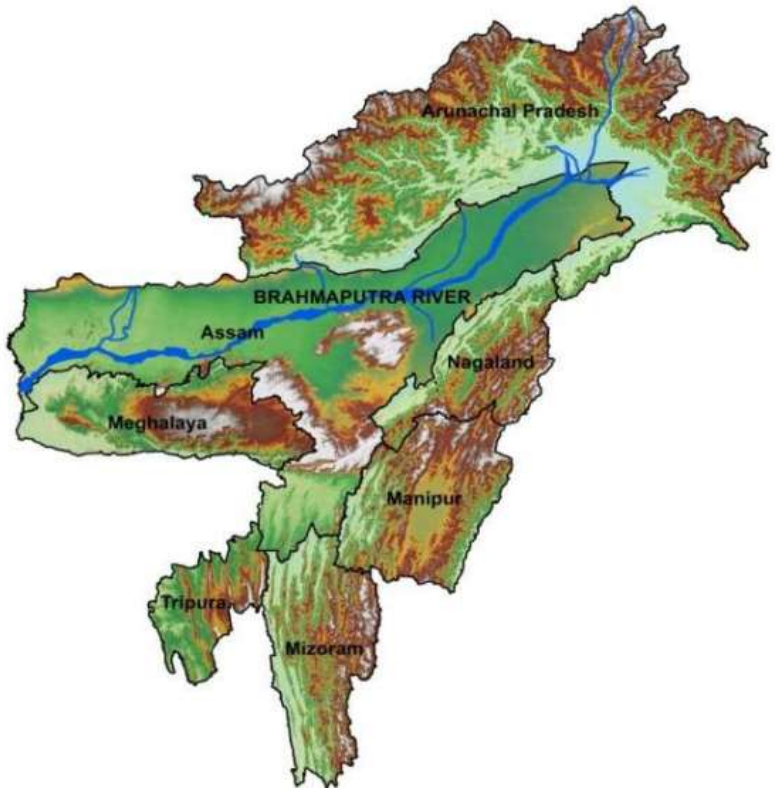

GROUND WATER LEVEL BULLETIN
AUGUST 2024
NORTH EASTERN STATES

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 869 observation wells called **National Hydrograph Network Stations (NHNS)**, as on 31.08.2024, located all over the North Eastern region 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. Unconsolidated and consolidated 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 36.37 bcm 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 %.

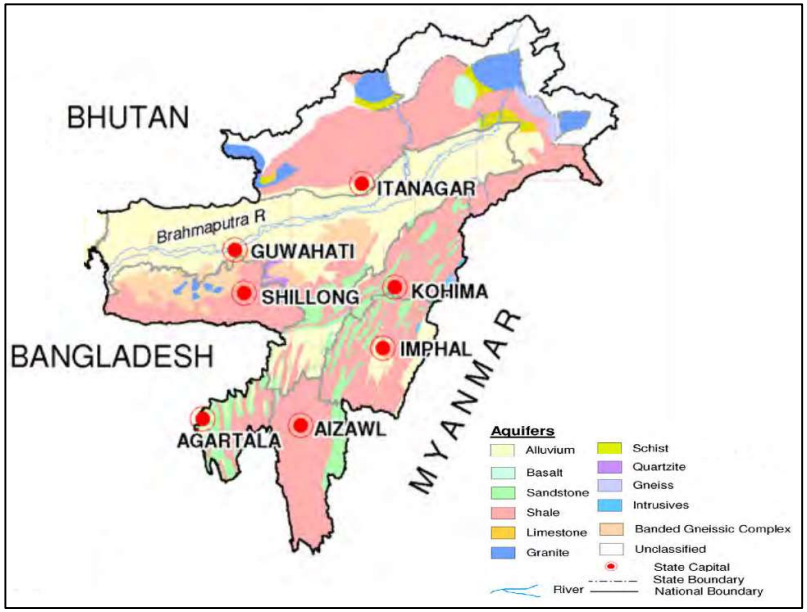

Fig.1 : Map showing disposition of principal aquifers of NE States

3.0 GROUND WATER LEVEL MONITORING

Central Ground Water Board, North Eastern Region, is monitoring changes in groundwater regime in the states 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 monitoring stations tillAugust2024 is 869 of which 696 are dug wells, 122 are Piezometers & 51are springs.

Table 1: State wise number of monitoring stations

Sl. No.	State	Existing Monitoring NHNS station as on August 2024			Total
		Dugwell	Piezometer	Springs	
1	Arunachal Pradesh	28	4	0	32
2	Assam	399	89	0	488
3	Manipur	4	0	2	6
4	Meghalaya	70	13	21	104
5	Mizoram	3	0	0	3
6	Nagaland	95	1	28	124
7	Tripura	97	15	0	112
	Total	696	122	51	869

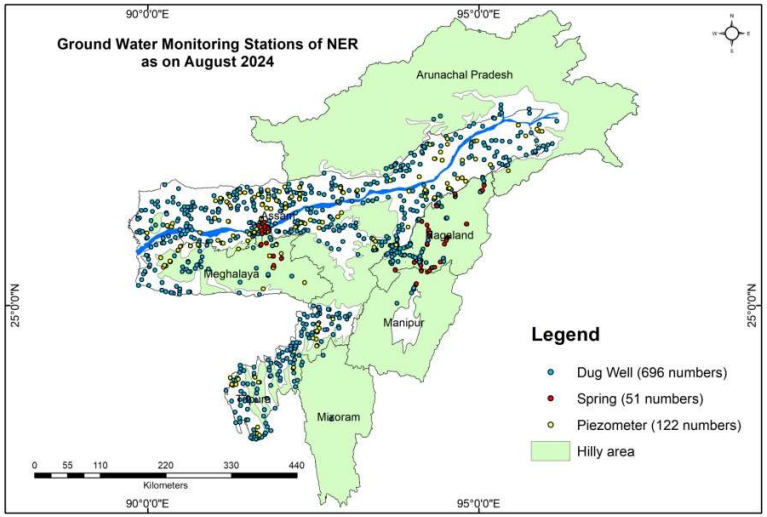

Fig.2: NHNS of NE States, as on August,2024

4.0 GROUND WATER LEVEL SCENARIO

4.1 Depth to Water level (August 2024)

Arunachal Pradesh

The depth to water level of 25dugwells is used for the analysis. Water level between 0-2 m bgl recorded in 13% of wells, between 2 to 5 m bgl in 32% of wells, between 5 to 10 m bgl in 12% of wells and between 10 to 20 m bgl in only 1 dug well.

Out of the 3 tubewells monitored, one station have water level in 0-2 m range and two wells have water level in 2-5m range.

Assam

A total of 355 dug wells were monitored in August 2024 and used for analysis of depth to water level in Assam. Water level between 0-2 m bgl recorded in 57.75% of wells, between 2 to 5 m bgl in 34.93% of wells,between 5 to 10 m bgl in 4.79% of wells and between 10 to 20 m bgl in 2.54% well.

Out of the 64 piezometers monitored 34.30% of stations have water level in 0-2m range, 39.06% of wells have water level in 2-5m range, 20.31% wells in 5-10m range and two wells have water level in 10-20m range.

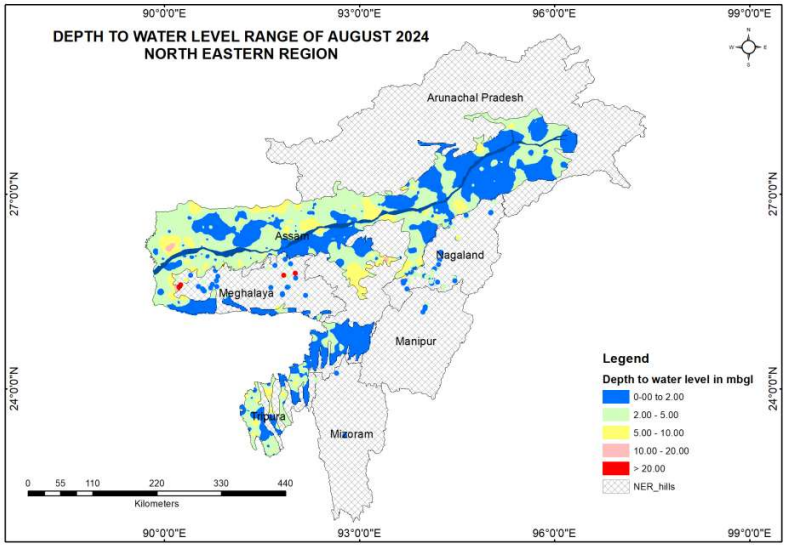

Fig.3: Depth to Water level Map (Aug 2024), NE States

Manipur

The state of Manipur has four dug well stations, out of which 3 is in 0-2m range and 1 well is in 2-5m range.

Meghalaya

In Meghalaya state 64 dug wells were monitored and anlysed for August 2024. In the range of 0-2mthere were 75% of wells, 23.44%

of wells in 2-5m and only two dug wells fall in 5-10 m range of water level.

A total of 13 piezometers were analysed for August 2024. Out of which 15.38% stations are in 0-2m range, 23.08% wells in 2-5m range, 30.77% wells in 5-10m range and 30.77% of wells have water level in >20m range.

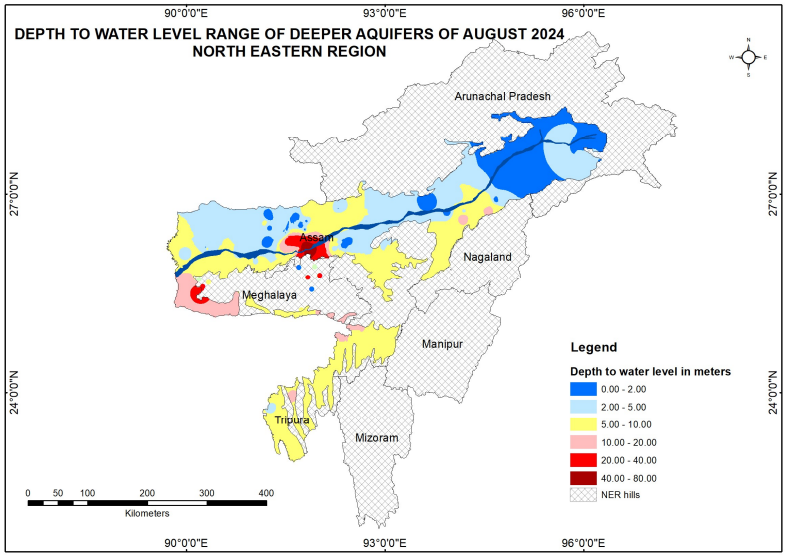

Fig.4: Depth to Water level Map of Deeper aquifers (Aug 2024), NE States

Nagaland

In Nagaland 96 dugwells were monitored and analysed. Out of which 50% stations are in 0-2m range, 34.38% wells in 2-5m range, 14.58% wells in 5-10m range and one well have water level in 10-20m range. Nagaland has only one piezometer and it has water level in 5-10m range in August 2024.

Tripura

The depth to water level of 91 dugwells were monitored and analysed for Tripura in August 2024. In these stations water level in the range of 0-2m is recorded in 50.55% stations, 2-5m range in 41.76% stations, 5-10m range in 6.59% stations and one dug well recorded water level in 10-20m range.

Out of the 5 piezometers monitored, two wells have water level in 0-2m range, 2 in 5-10m range one well has water level in 10-20m range.

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

Arunachal Pradesh

Out of 27 wells, 3 wells (11.11% of total wells) are showing fall in water level and 24 wells (88.89% of total wells)are showing rise in Aug 2024 when compared with March 2024 water level data. Out of 3 wells, 2 wells showing fall in the range of 0-2 m and 1 of the wells is showing fall in the range of 2-4 m while. Out of the 24stations showing rising trend, 19 dug wells (70.37% of the total) are showing rise in the range of 0-2m and 2 stations show rise in 2-4m range and 3 stations have rise in greater than 4 m. Rise of more than 4 m is mainly observed in the Lower Subansiri district and Lohit district.

Assam

In Assam a total of 356 stations were anlysed, out of which 91.29% (325) stations show riseing and 8.71% (31) stations show falling. Out of the 325 stations, 57.02% (203) stations have rise in 0-2m range, 24.72% (88) stations have rise in 2-4m range and 9.55% (34) stations have rise in >4m range. Fall in the 0-2m range was recorded in 7.02% (25) stations, 2-4m in 1.40% (5) stations and only one station from Darrang district show fall in >4m range. Rise of >4m range is recorded from baksa, bongaigaon, Charaideo, Darrang, Dhubri, East Karbi

Anglong, Goalpara, Golaghat, Hailakndi, Hoaji, Kokrajhar, Morigaon, Nagaon and Sonipur District.

Manipur

Monitoring of four stations is going on only in Senapati district of Manipur. All the four stations show rise as compared to March 2024 water level datal, 3 in 0-2m range anf one in 2-4m range.

Meghalaya

A total of 76 stations were analysed in meghalaya for August 2024 for seasonal fluctuation w.r.t. March 2024. Out of the 76 stations, 71 stations have rise and only 5 stations shoe falling trend. Rise in the range of 0-2m range is recorded in 64.47% (49) stations, 2-4m range in 23.68% (18) stations and 4 stations have rise in >4m range. Fall in the range of 0-2m is recorded in 3 stations and 2-4m range in 2 stations. Rise of >4m is recorded in East Khasi Hills, North Garo Hills, Ri Bhoi and West Garo Hills district.

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 85 station were analysed in Nagaland state, out of which 64 (75.29%) stations show rise and 21 (24.71%) stations show falling trend. Rise in the range of 0-2m is recorded in 39 (45.88%) stations, 2-4m in 15 (17.65%) stations and 10 (10.76%) stations have rise in >4m range. Fall in 0-2m rnage is recorded in 14 (16.47%) stations, 2-4m in 6 (7.06%) stations and only one station from Mokochung district have fall >4m range. Rise of >4m is recorded from Chumukedima,, Dimapur, Mokochung, Nuiland and Tseminyu district.

Tripura

Out of 99 wells, 93 wells (93.94% of total wells) are showing rise and only 6 wells (6.06%) are showing fall in water level in August 2024 when compared with March 2024 water level data. Out of 93 wells, 50 (50.51%) of the wells are showing rise in the range of 0-2 m, 32 (32.32 %) of wells showing fall in the range of 2-4 m while, only 11 wells (11.11% of the total) showing rise greater than 4 m. Fall is recorded in 6 (6.06%) stations all in the range of 0-2m. Rise in the range of >4 m is being observed in the districts of North Tripura, South Tripura and Unakoti.

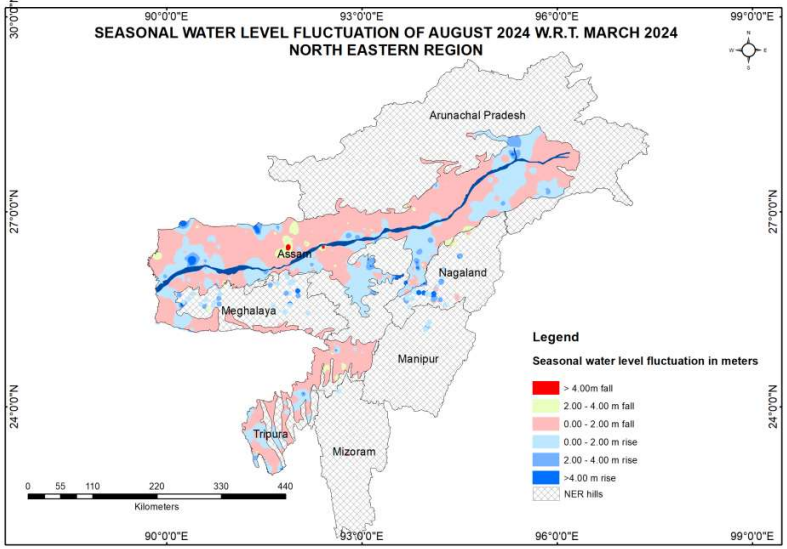

Fig. 5: Seasonal Fluctuation in water level (Mar 2024 Vs Aug 2024)

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

Arunachal Pradesh

Comparison of August 2024 to August 2023 water level data was done for 28 stations in Arunachal Pradesh. Fall and rise was recorded in 23 (82.14%) and 5 (17.86%) stations respectively. Rise in the range of 0-2m was recorded in 3 (10.71%) stations, one station each in 2-4m and >4m range was recorded in the state.

Assam

A total of 313 stations were analysed during August 2024 w.r.t. August 2023, out of which 194 stations show fall and 119 stations show rise in water level. Fall in the range of 0-2m range is recorded in 175 (55.91%) stations, 2-4m range in 14 (4.47%) stations and 5 (1.6%) stations have water level fall in >4m range. Rise in the range of 0-2m range is recorded in 92 (29.39%) stations, 2-4m in 23 (7.35%) stations and >4m range in 4 (1.28) stations of the state.Rise of >4m range is recorded in districts of Dhubri, East Garo Hills and Morigaon. Fall of >4m range is recorded in Biswanath, Darrang, Morigaon, Lakhimpur and Sonitpur districts.

Meghalaya

In Meghalaya 58 station were analysed, out of which 21 (37.93%) stations show fall and 36 (62.07%) stations show rise in water level in August 2024 w.r.t. August 2023. Out of the 36 stations, 31 (53.45%) stations have rise in the tange of 0-2m, 2 (3.45%) stations in 2-4m and 3 (5.17%) stations have water level rise in >4m range. Rise of >4m range is recorded in East Garo Hills, Ri Bhoi and West Garo Hills districts. Fall in the range of 0-2m is recorded in 21 (36.21%) stations and one station have fall in >4m range from North Garo Hills district.

Mizoram

Three stations are being monitored in Mizoram, one each in Kolasib, Mamit and Serchip district. Out of the three the wells at Kolasib and Mamit district have water level rise in 0-2m range and the well at Serchip district have water level fall also in 0-2m range.

Nagaland

Monitoring started from January 2024 only.

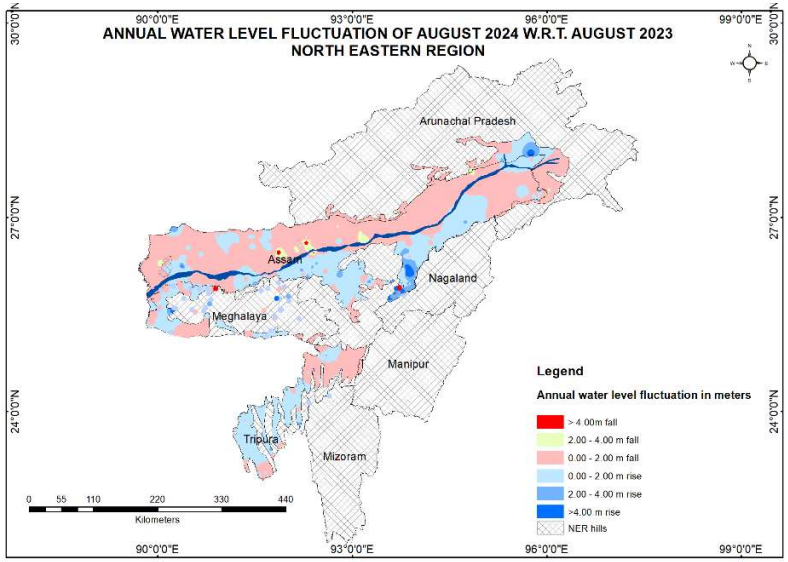

Fig. 6: Annual Fluctuation in water level (Aug 2023 Vs Aug 2024)

Tripura

In Tripura state, 92 stations were analysed wrt August 2023 water level, out of which 71 (77.17%) stations show rise and 21 (22.83%) stations show falling trend. Rise in the range of 0-2m is recorded in 67

(7283%) stations, 2-4m in 3 (3.26%) stations and one station from North Tripura district have rise in >4m range. Fall in the range of 0-2m range is recorded in 20 (21.74%) stations and one station from Dhalai district have fall in the range of >4m range.

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

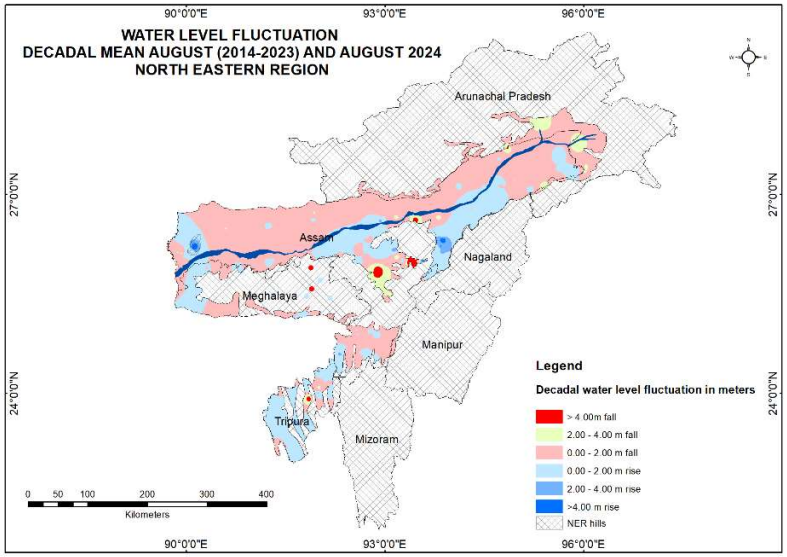

Fig. 7: Decadal Fluctuation in water level (Aug 2014 to Aug 2023 Vs Aug 2024)

Arunachal Pradesh

Out of 21 wells, only 5 wells (~23.81% of total wells) are showing rise in water level and 16 wells (76.19% of total wells) are showing fall in water level in August 2024 when compared with last 10 years (2014-2023) monsoon water level data. Out of 5 wells, 4 of the wells showing rise in the range of 0-2 m and one well is showing rise in the range of 2-4 m while. Fall in the range of 0-2m is recorded in 15 (71.43%) wells and in the range of 2-4m is recorded in only one well.

Assam

Decadal analyses of 211 wells of Assam show rise in 52.61% (111 wells) of wells and fall in 47.4% of wells (100 wells) in the state. Out of 111 wells, rise is recorded in 47.87% (101 stations) have fluctuation in 0-2 m range, 3.79% (8 stations) in 2-4 m range and two stations have rise in >4m range. Majority of fall recorded in 0-2 m range in 44.08% (93) stations, 5 stations (2.37%) recorded fall in 2-4 m range and two stations recorded fall in >4m range.

Meghalaya

For Meghalaya state analysed 37 stations for August 2024 and compared with respect to August 2014 wherein rise is recorded in 64.86% (24) stations and fall is recorded in 35.1% (13) stations. Rise in 0-2m range is recorded in 22 (59.46%) stations and 2-4m in two stations. Fall in the range of 0-2m is recorded from 12 (32.43%) stations and one station from North Garo Hills have fall >4m range. Minimum and maximum rise is 0.02 m in East Khasi Hills district and 2.12 m in East Garo Hills district respectively. Minimum fall of 0.01m in East Khasi Hills district and maximum fall of 4.14m in North Garo Hills district was recorded.

Nagaland

Analysis of 10 wells in Dimapur district was only done. Out of which 40% (4) stations have rise and 60% (6) stations have fall in the district.

Out of 4 stations, one station show rise each in 0-2m range and >4m range. Two stations have rise in 2-4m range. Out of the 6 stations, 3 stations show fall in 0-2 m range, 2 stations in 2-4 m range and one station show fall in >4m range.

Tripura

In Tripura state, a total of 48 stations were analysed wherein 79.17% (38) stations show rise and 20.83% (10) stations show fall. Out of the 38 stations showing rising trend, 72.92% (35) stations show rise in 0-2m range and 6.25% (3) stations show rise in 2-4 m range. Out of the 10 stations showing falling trend, 8 (16.67%) stations have fall in 0-2 m range and 2 stations have fall in 2-4 m range.

4.4 Measurement of Spring discharge in the Hilly Regions

Manipur

Two springs were monitored in Senapati district of Manipur in August 2024. The spring at Upper Kathikho is dry and on the other hand spring at Mao gate has a discharge of 0.69 lps.

Meghalaya

Total 19 numbers of springs discharge were in Meghalaya State in the month of August 2024. Out of that, 94.74% (18 numbers out of 19) were showing discharge in the range of 0-5 lps, with a maximum of 2.14 lps reported from Mawsynram, East Khasi Hills. Only one spring, UmshingUmjapung from East Khasi Hills has discharge of >10 lps.

Nagaland

Total of 21 springs were monitored in Nagaland state. Out of that, 20 springs have discharge in 0-2 lps. One spring at Laqlato from Zunheboto district have discharge in 5-10 lps range.

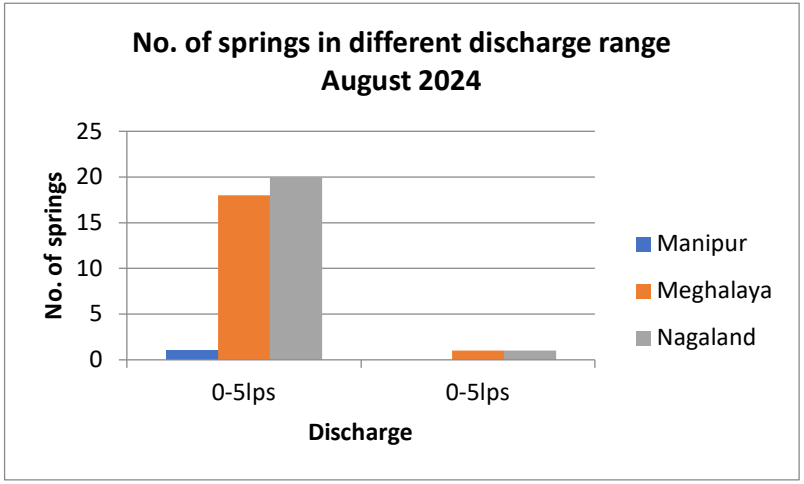

Fig.8: Number of Spring with discharge (in lps) in specified range.