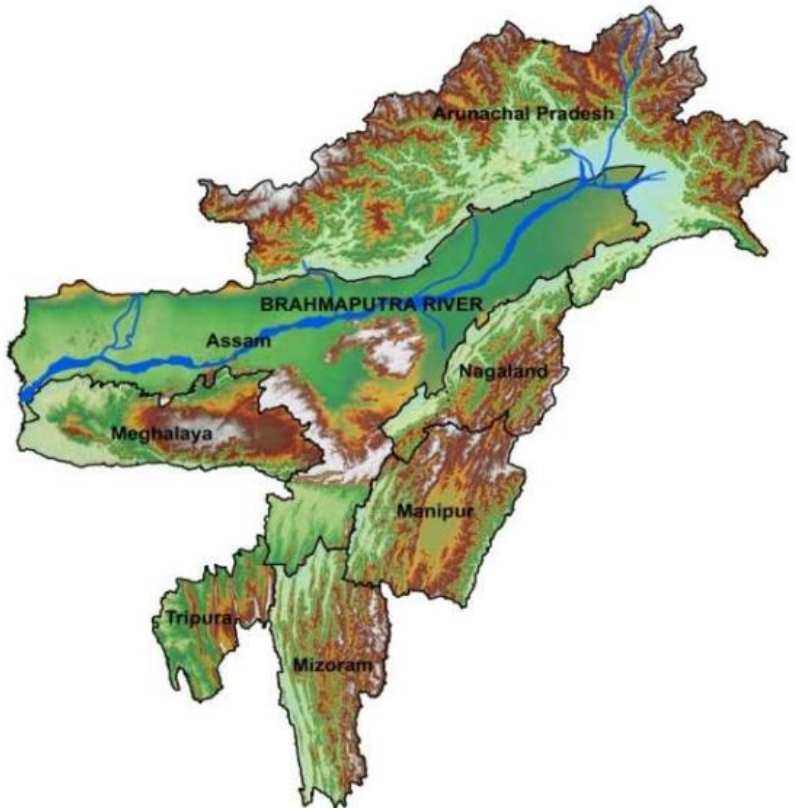

GROUND WATER LEVEL BULLETIN

MARCH 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 %.

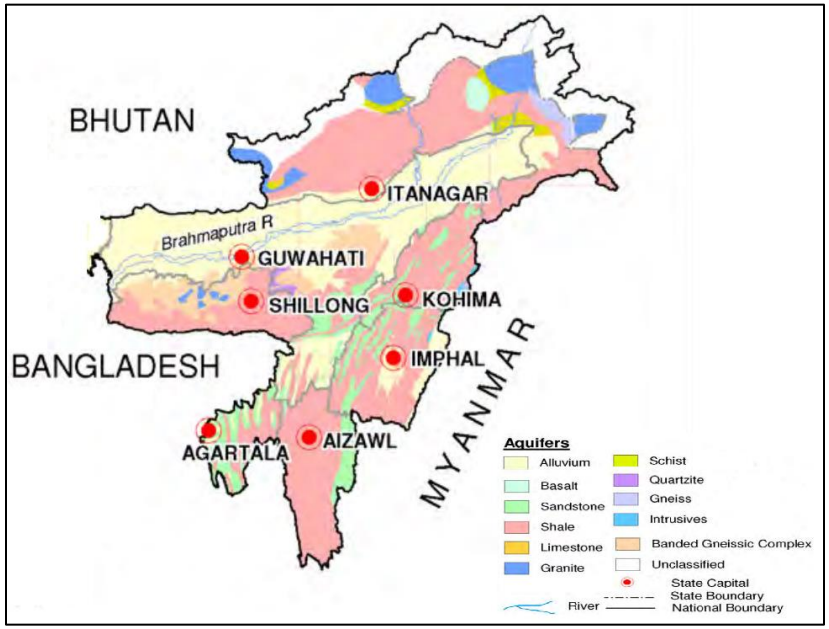

Fig.1 : Map showing disposition of principal aquifers of NE States

3.0 GROUND WATER LEVEL MONITORING

Central Ground Water Board, North Eastern Region, is monitoring changes in groundwater 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 March 2024 is 869 of which 696 are dugwells, 122 are Piezometers & 51are springs.

Table 1: State wise number of monitoring stations

Sl. No.	State	Existing Monitoring NHNS station as on March 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

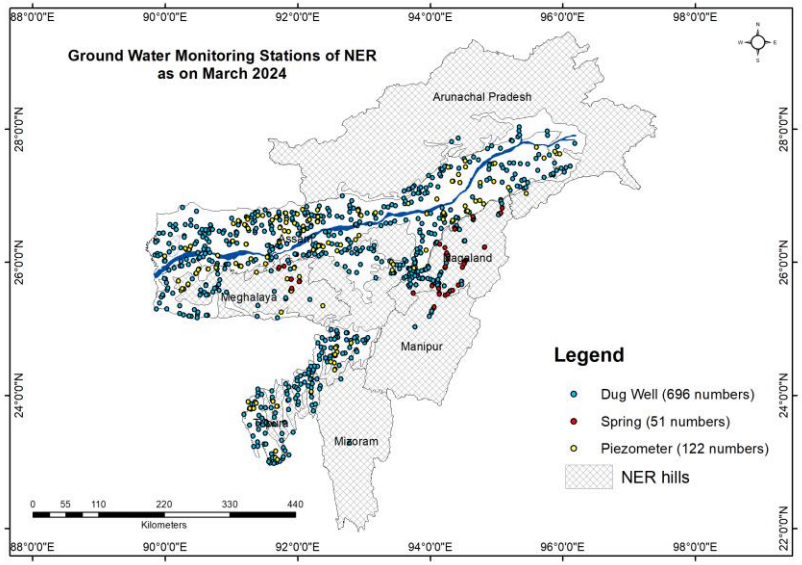

Fig.2: NHS monitoring stations of NE States, as on March, 2024

4.0 GROUND WATER LEVEL SCENARIO

4.1 Depth to Water level (March 2024)

Arunachal Pradesh

The depth to water level of 30 dugwells is used for the analysis. Water level between 0-2 m bgl recorded in 20% (6 wells) of wells, between 2 to 5 m bgl in 46.67% (14 stations) of wells, between 5 to 10 m bgl in 26.67% (8 stations) of wells and between 10 to 20 m bgl in two dug well.

All four of the piezometers in Namsai district have water level in 2-5m range.

Assam

A total of 385 dugwells were monitored in March 2024 and used for analysis of depth to water level in Assam. Water level between 0-2 m bglrecorded in 17.40% (67) of wells, between 2 to 5 m bgl in 57.66% (222) of wells, between 5 to 10 m bgl in 19.74% (76 stations) of wells and between 10 to 20 m bgl in 4.94% (19) well. One well from east Karbi Anglong district have water level in more than 20m range.

Out of the 66 piezometers monitored 10.61 % (7 wells) of stations have water level in 0-2m range, 40.91% (27 wells) of wells have water level in 2-5m range, 36.36% (24) wells in 5-10m range and 12.12% (8) wells have water level in 10-20m range.

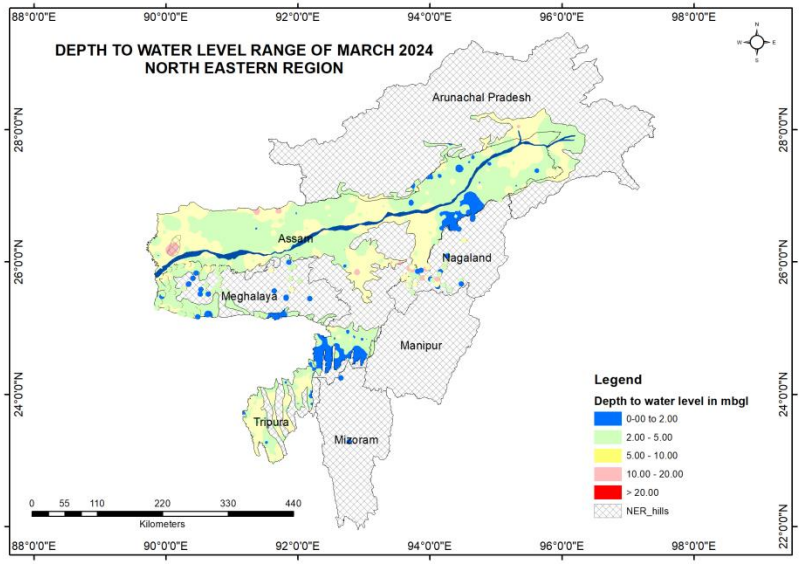

Fig.3: Depth to Water level Map (Mar 2024), NE States

Manipur

The state of Manipur has four dugwell stations, and all of them have water level in 2-5m range.

Meghalaya

In Meghalaya state 70 dugwells were monitored and anlysed for March 2024. In the range of 0-2m there were 21.95% (18) of wells, 57.32% of wells in 2-5m, 13.41% (11) stations have water level in 5-10m range, two dugwells fall in 5-10m range of water level, and four wells , two from Ri Bhoi district and two from West Garo Hills, have water level in >20m range.

A total of 13 piezometers were analysed for March 2024. Out of which 23.08% (3) stations have water level in 2-5m range, 30.76% (4) wells in 5-10m range, 15.38% (2) wells in 10-20m range and 30.77% (4) of wells have water level in >20m range.

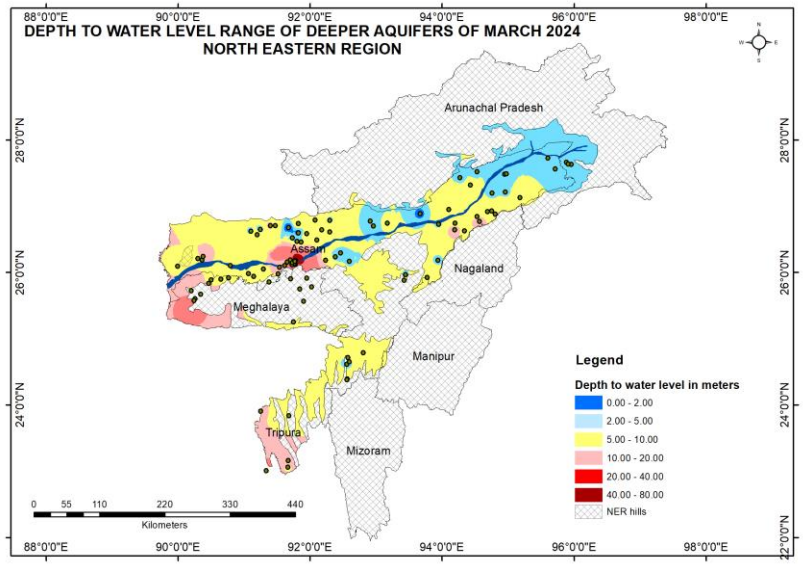

Fig.4: Depth to Water level Map of Deeper aquifers (Mar 2024), NE States

Nagaland

In Nagaland 91 dugwells were monitored and analysed. Out of which 27.47% (25) stations are in 0-2m range, 34.07% (31) wells in 2-5m range, 28.57% (26) wells in 5-10m range, 8.79% (8) well have water level in 10-20m range, and one well have water level in >20m range.

Nagaland has only one piezometer and it has water level of 9.41m range in March 2024.

Tripura

The depth to water level of 98 dugwells were monitored and analysed for Tripura in March 2024. In these stations water level in the range of 0-2m is recorded in 16.33% (16) stations, 2-5m range in 50.00% (49) stations, 5-10m range in 29.29% (29) stations, 3.06% (3) dug well recorded water level in 10-20m range and one well has water level in >20m range..

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

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

Arunachal Pradesh

Comparison of March 2024 to March 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.Fall in the range of 0-2m range is recorded in 17 (60.71%) stations, 2-4m range in 6 (21.43%) stations and there were no stations that have water level fall in >4m range.

Assam

A total of 313 stations were analyzed for Assam in March 2024 w.r.t. March 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 Darrang and Morigaon districts.

Meghalaya

In Meghalaya 58 station were analysed, out of which 22 (37.93%) stations show fall and 36 (62.07%) stations show rise in water level in March 2024 w.r.t. March 2023.Out of the 36 stations, 31 (53.45%) stations have rise in the range 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.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 districts. 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.

Tripura

In Tripura state, 92 stations were analysed wrt March 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 2-4m.

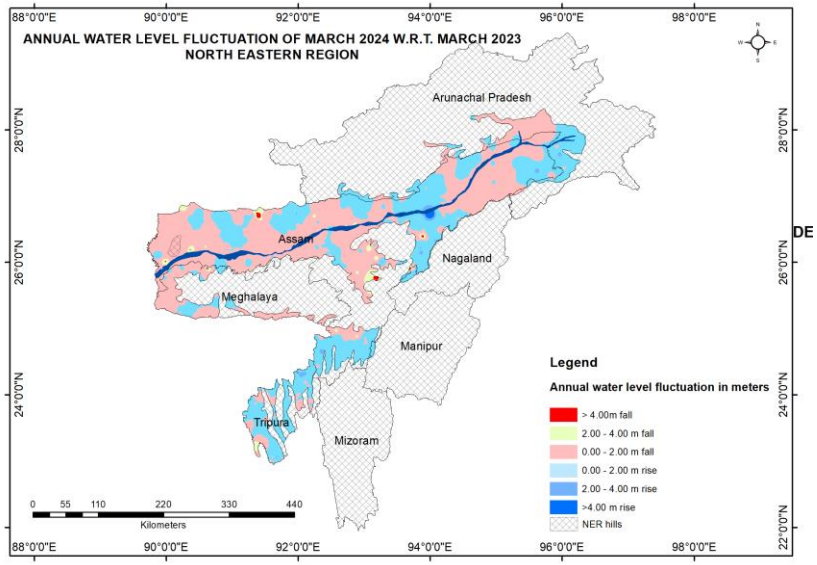

Fig. 6: Annual Fluctuation in water level (Mar 2023 Vs Mar 2024)

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

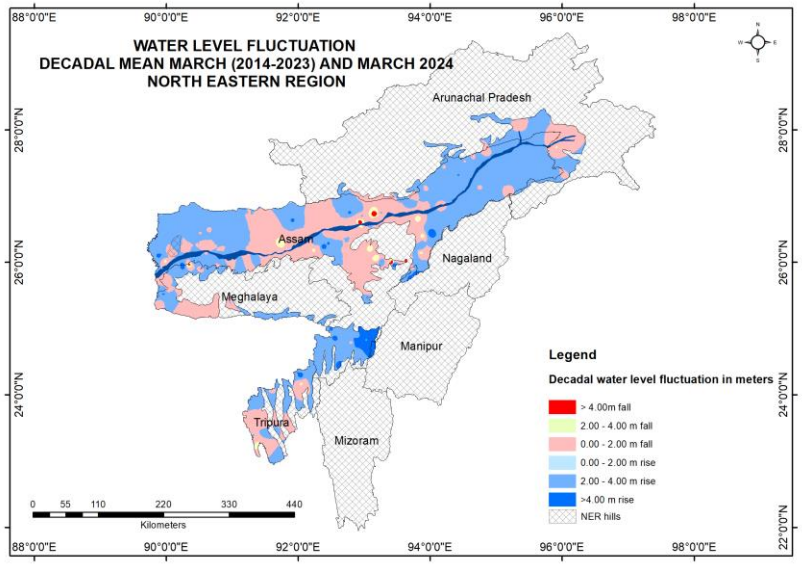

Fig. 7: Decadal Fluctuation in water level (Mar 2014 to Mar 2023 Vs Mar 2024)

Arunachal Pradesh

Out of 20 wells, 10 wells 50% of total wells) are showing rise in water level and 10 wells (50% of total wells) are showing fall in water level in March 2024 when compared with last 10 years (2014-2023) monsoon water level data.Out of 10 wells, 8 of the wells showing rise in the range of 0-2 m and 2well is showing rise in the range of 2-4 m.Fall in the range of 0-2m is recorded in 10 (71.43%) wells.

Assam

Decadal analysis of 211 wells of Assam show rise in 58.77% (124 wells) of wells and fall in 41.23% of wells (87 wells) in the state. Out of 124 wells, rise recorded in 55.92% (118 stations) have fluctuation in 0-2m range, 1.90% (4 stations) in 2-4m range and two stations have rise in >4m range.Majority of fall is recorded in 0-2m range in 36.97% (78) stations, 7 stations (3.32%) recorded fall in 2-4m range and two stations recorded fall in >4m range.

Meghalaya

Meghalaya state analyzed 46 stations for March 2024 with respect to March 2014 wherein, rise is recorded in 54.35% (25) stations and fall is recorded in 45.65% (21) stations.Rise in 0-2m range is recorded in 24 (52.17%) stations and 2-4m in one station. Fall in the range of 0-2m is recorded from 21 (45.65%) stations. Minimum and maximum rise is 0.01m and 2.31m respectively and both are recorded inEast Garo Hills district. Minimum and maximum fall of 0.02m and 1.45 m are recorded in Ri-Bhoi district East Khasi Hills district respectively.

Nagaland

Analysis of only 9 wells in Dimapur district was done. Out of which 66.67% (6) stations have rise and 33.33% (3) stations have fall in the district.Out of the 6 stations, 4 stations show rise in 0-2m range and 1 station each show rise in the range of 2-4m and>4m. Three stations have fall in 2-4m range.

Tripura

In Tripura state, a total of 47 stations were analyzed wherein 61.70% (29) station show rise and 38.30% (18) stations show fall.Out of the 29 stations showing rising trend, 59.57% (28) stations show rise in 0-2m range and 2.13% (1) stations show rise in 2-4m range.Out of the 18 stations showing falling trend, 29.79% (14) stations have fall in 0-2m range, 6.38%(3) stations have fall in 2-4m range and 1 station show falling trend in the range of >4m..

4.4 Measurement of Spring discharge in the Hilly Regions

Manipur

Out of the two springs monitored in Senapati district, only one springs was showing discharge and the other one was dry were during March 2024. The spring at Upper Kathikho is dry and on the other hand spring at Mao gate has a discharge of 0.3lps.

Meghalaya

Out of the 19 numbers of springs measured for their discharge in Meghalaya State, one spring at Wahlong was dry during March 2024. Rest 18 numbers of measured springshave discharge within 0-3 lps, with a maximum of 2.25 lps reported from Umshing Umjapung, East Khasi Hills.

Nagaland

Total of 15 springs were monitored in Nagaland state. All of the springs have discharge in 0-0.5 lps. Highest discharge of 0.23lps was recorded from Zapami spring in Phek district.