GROUND WATER SCENARIO IN INDIA

PREMONSOON, 2017

CENTRAL GROUND WATER BOARD

MINISTRY OF WATER RESOURCES

GOVT OF INDIA

Index

Depth to Water Level (m bgl)

- <2
- 2 to 5
- 5 to 10
- 10 to 20
- 20 to 40
- >40
- Hilly Area

GROUND WATER LEVEL SCENARIO IN INDIA
(PREMONSOON - 2017)

1.0   Introduction

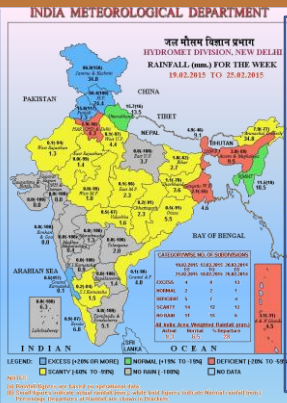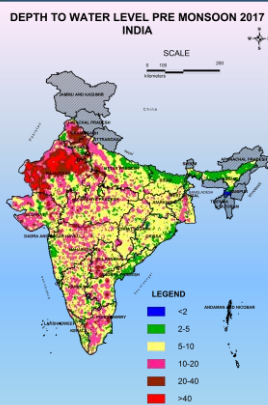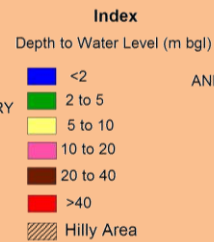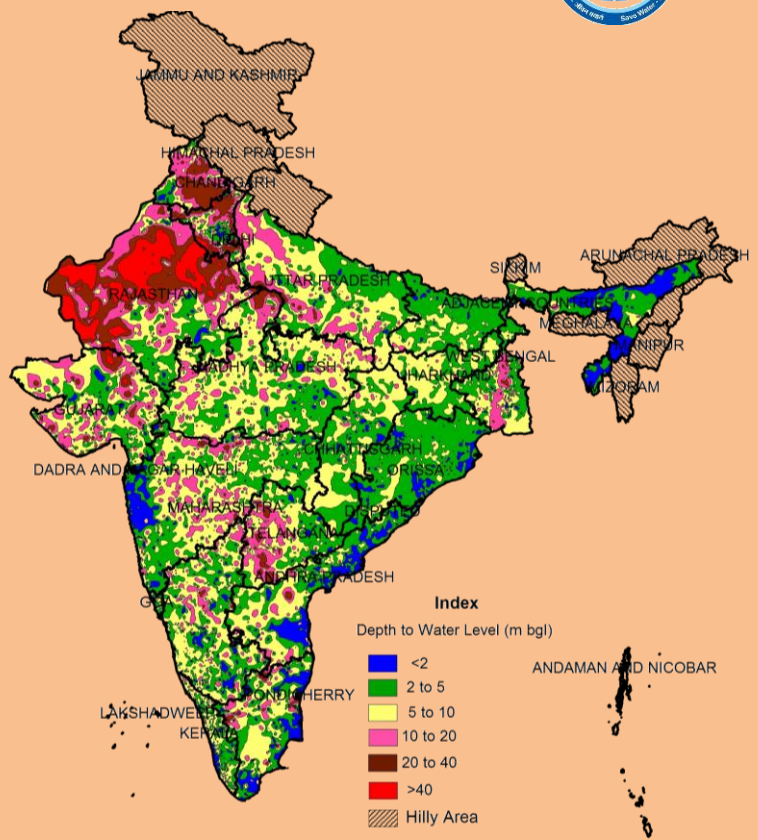Ground water regime monitoring is one of the key activities of CGWB to generate information on ground water level/ quality through representative sampling. The primary objective of establishing the ground water monitoring network stations is to record the response of ground water regime to the natural and anthropogenic stresses of recharge and discharge parameters with reference to geology, climate, physiography, land use pattern and hydrologic characteristics.

Ground water levels are being monitored throughout the Country four times in a year by Central Ground Water Board through a network of **23125** monitoring wells during the months of January, Premonsoon (March/April/ May), August and November (Postmonsoon).

The ground water regime monitoring was started in the year 1969 by Central Ground Water Board. At present CGWB has a network of 23125 ground water observation wells, out of which **16703** observation wells are dugwells and **6422** are piezometers. The water level / piezometric head data collected from these observations were entered into the National database and are analysed for obtaining background information of ground water regime and changes on regional scale. The Groundwater level data has been collected from all the states except for Mizoram & Sikkim and UT of Lakshadweep where water level monitoring is not being carried out.

Water level data of Premonsoon 2017 has been analysed to illustrate spatial distribution of water level and its categorization under different ranges. The Premonsoon data has been compared with the previous year Premonsoon data (annual fluctuation) and mean of last 10 years Premonsoon monitoring data (decadal fluctuation); the analytical results are represented through tables and maps along with suitable explanations. Database thus generated forms the basis for planning the ground water development and management programme. This data is also used for assessment of ground water resources and establishing changes in the regime consequent to various development and management activities.

2.0   Rainfall Pattern

Water level / Piezometric heads are resultant of all input/ output from the aquifer. Apart from draft of ground water for various purposes, quantum of rainfall and its component being recharged to the ground water is major controlling factor of the depth to water levels and it's annual, seasonal or decadal fluctuations. Thus, study of rainfall pattern is very important for understanding spatial and temporal variations in water levels. As per the Climatic bulletins of IMD for monsoon period of 2016, the rainfall pattern has been studied and discussed below.

For the country as a whole, cumulative rainfall during the year's monsoon has been 12% below the Long Period Average (LPA).

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	777.5	886.9	-12%
Northwest India	483.1	615.0	-21%
Central India	879.7	974.2	-10%
South Peninsula	665.4	715.7	-7%
East & northeast India	1267.7	1437.8	-12%

Out of 36 meteorological subdivisions, the rainfall has been excess over 1, normal over 23, deficient over 12 sub-divisions and no sub-division under scanty rainfall. Haryana, Chandigarh & Delhi, Punjab and West Uttar Pradesh received deficient rainfall by more the 50% of LPA. In area-wise distribution, 3% area of the country received excess, 67% normal and remaining 30% area received deficient rainfall.

Main Features of Southwest Monsoon, 2016
- Southwest monsoon set in over Kerala on June 2016, as against forecast date of 5 June ± 4 days

- Observed rainfall for the country as a whole during the month of July & Premonsoon was 90% & 91% of the LPA against the forecast of 93%± 9% & 96%±9% of LPA respectively

- The seasonal rainfall for the country as a whole has been 88% of the LPA as against updated Long Range Forecast of 87%± 4% of LPA.

Plate II

DEPTH TO WATER LEVEL PRE MONSOON 2017
INDIA

SCALE

0   100   200

kilometers

LEGEND

■ (blue)	<2
■ (green)	2-5
■ (yellow)	5-10
■ (pink)	10-20
■ (brown)	20-40
■ (red)	>40

ANDAMAN AND NICOBAR

Source: National Data Centre, CGWB, Faridabad

4
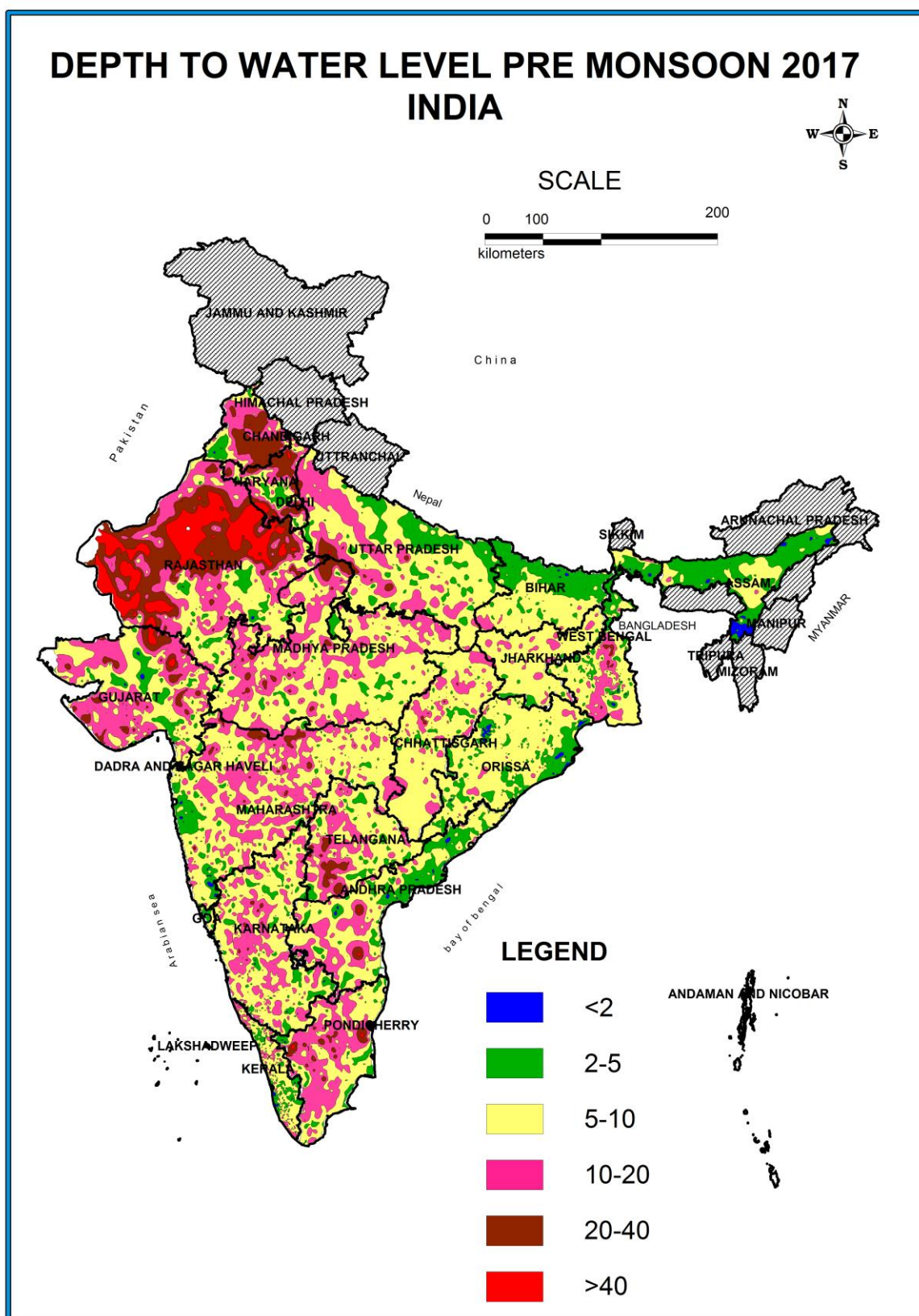
3.0   Ground Water Level Scenario in India

3.1   Ground Water Level Scenario - Premonsoon 2017

The ground water level data for Premonsoon 2017 indicates that out of the total **15078** wells analysed, 626 (4 %) wells are showing water level less than 2 m bgl (metres below ground level), 3592 (24%) wells are showing water level in the depth range of 2-5 m bgl, 6423 (43 %) wells are showing water level in the depth range of 5-10 m bgl, 3457 (23%) wells are showing water level in the depth range of 10-20 m bgl, 740 (5%) wells are showing water level in the depth range of 20-40 m bgl and the remaining 240 (2%) wells are showing water level more than 40 m bgl. The maximum depth to water level of 134.22 m bgl is observed in Bikaner district of Rajasthan whereas the minimum is less than 1 m bgl.

The depth to water level map of Premonsoon 2017 for the country indicates that the general depth to water level of the country ranges from 2 to 20 m bgl. To be more specific, in major parts of the country, water level is observed to be in the range of 5 to 10 m. Very shallow water level of less than 2 m bgl is also observed locally, in isolated pockets, in few states, such as Assam, Goa and Himachal Pradesh. In major parts of north-western and western states, depth to water level is generally deeper and ranges from about 10- 40 m bgl. In parts Delhi, Chandigarh and Rajasthan, water level of more than 40 m bgl is also recorded. The peninsular part of country recorded a water level in the range of 5 to 20 m bgl. The maximum depth to water level of 134.22 m bgl is observed in Bikaner district, Rajasthan whereas the minimum is less than 1 m bgl, seen in various states.

Fig 1

Number of Wells Showing Depth to Water Level (m bgl) in Different Ranges, Premonsoon 2017, India

Plate III

Water Level Fluctuation
(Pre Monsoon 2016 to Pre Monsoon 2017)

SCALE

0   100   200
kilometers

N
W — E
S

JAMMU AND KASHMIR

China

Pakistan

HIMACHAL PRADESH

CHANDIGARH

UTTRANCHAL

HARYANA

DELHI

Nepal

UTTAR PRADESH

RAJASTHAN

SIKKIM

ARUNACHAL PRADESH

BIHAR

ASSAM

MANIPUR

MADHYA PRADESH

WEST BENGAL

BANGLADESH

MYANMAR

JHARKHAND

TRIPURA

MIZORAM

GUJARAT

DADRA AND NAGAR HAVELI

CHHATTISGARH

ORISSA

MAHARASHTRA

TELANGANA

ANDHRA PRADESH

bay of bengal

Arabian sea

GOA

KARNATAKA

ANDAMAN AND NICOBAR

Legend

PONDICHERRY

STATE BOUNDARY

LAKSHADWEEP

KERALA

Water Level Fluctuation (m)

RISE   FALL

<2   <2

2 - 4   2 - 4

>4   >4

Hilly Area

Source: National Data Centre, CGWB, Faridabad

3.2   Water Level Fluctuation (Premonsoon 2017 to Premonsoon 2016)

The water level fluctuation of **Premonsoon 2017 to Premonsoon 2016** shows that out of 13423 wells analysed, 6423 (48%) are showing rise and 6407 (48%) are showing fall in water level. Remaining 593 (4%) stations analysed do not show any change in water level.   Both rise and fall are equally predominant in the country.   Both rise and fall are equally predominant. About 36% wells are showing rise in the water level in the range of less than 2 m. About 7% wells are showing rise in water level in 2-4 m range and 5% wells showing rise in water level more than 4 m range. Similarly, about 48% wells are showing decline in water level, out of which 36% wells are showing decline in water level in less than 2 m range. About 7% wells are showing decline in water level in 2-4 m range and 5% wells are showing decline in water level more than 4 m range (**Fig-2** and **Annexure-II**). Majority of the wells showing rise/decline falls in the range of 0-2 m.

A comparison of depth to water level of Premonsoon 2017 to Premonsoon 2016 is presented in the form of water level fluctuation map (**Plate III**) reveals that in general, there is both rise and fall in water level in almost the entire country. Rise in water level in isolated pockets is observed in the states of Assam, Bihar, Chhatishgarh, Madhya Pradesh, Gujarat, Rajasthan, Maharashtra, Telangana and Uttar Pradesh. Fall is mostly in the range of 0-2 m, although fall in the range of more than 2 m is also prevalent in all the states in small patches. Fall of more than 4 m is prominent in the states of Andhra Pradesh, Chandigarh, Delhi, Karnataka and Tamil Nadu.

Fig 2
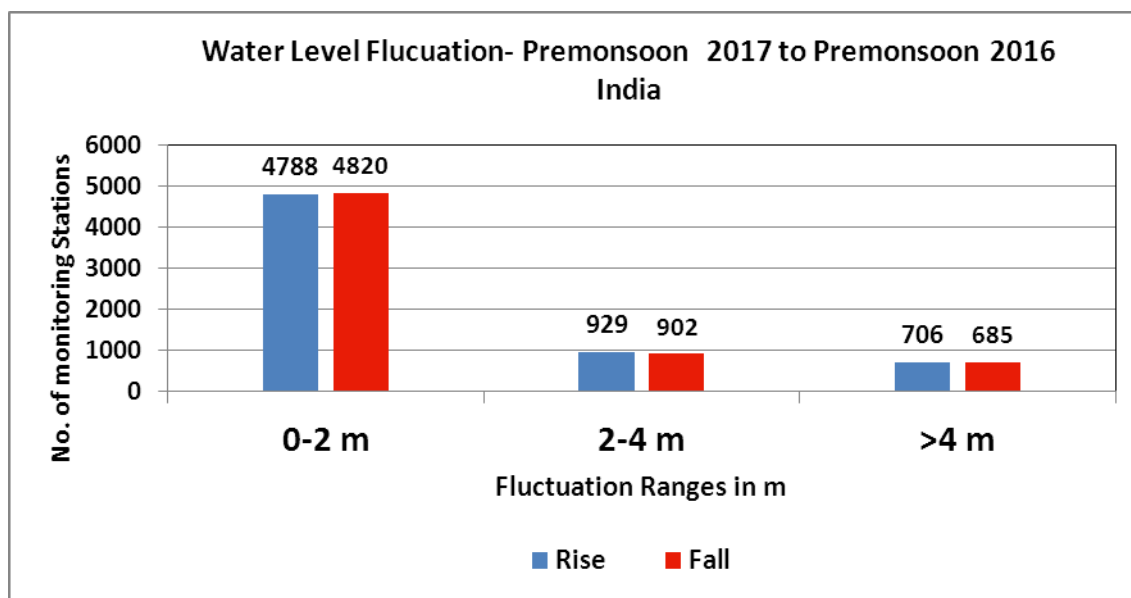
Source: National Data Centre, CGWB, Faridabad

3.3   Water Level Fluctuation (Premonsoon–2017 with Mean of Premonsoon (2006 - 2016)

A comparison of depth to water level of Premonsoon 2017 with decadal mean of Premonsoon (2007-2016) indicates that **5609 (about 39%)** of wells are showing rise in water level, out of which 30% wells are showing rise of less than 2 m. About 6% wells are showing rise in water level in the range of 2-4 m and only 3% wells are showing rise in the range of more than 4 m. **8785 (about 61%)** wells are showing decline in water level, out of which 43% wells are showing decline in water in the range of 0-2 m. 11% wells are showing decline in water level in 2-4 m range and remaining 7% are in the range of more than 4 m.

Decline is seen in almost all the states/UTs of the country, except few states namely Arunachal Pradesh, Bihar, Daman & Diu, Goa, Telangana, Tripura and West Bengal. Decline of more than 4 m has also been observed in pockets in the states/UTs of Andhra Pradesh, Chandigarh, Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Delhi, Gujarat, Haryana, Karnataka, Maharashtra, Pondicherry, Punjab, Rajasthan, Tamil Nadu and Telangana. Rise in water level of more than 4 m is also observed in few states in isolated pockets such as Arunachal Pradesh, Dadra & Nagar Haveli, Rajasthan, Telangana and West Bengal.

The decadal water level fluctuation map of India for Premonsoon, 2017 with the mean of Premonsoon (2007-2016) is shown in **Plate-IV** and frequency distribution of fluctuation ranges is shown in **Fig. 3.** Almost the whole country is showing decline in water level, maximum fall is observed in and around parts of Rajasthan, Haryana, Punjab, Gujarat, Telangana, and Maharashtra, A rise in water level is observed in few states but occurs sporadically.

Fig 3

Water Level Fluctuation
Decadal Mean Pre Monsoon (2007-2016)Vs Pre Monsoon -2017
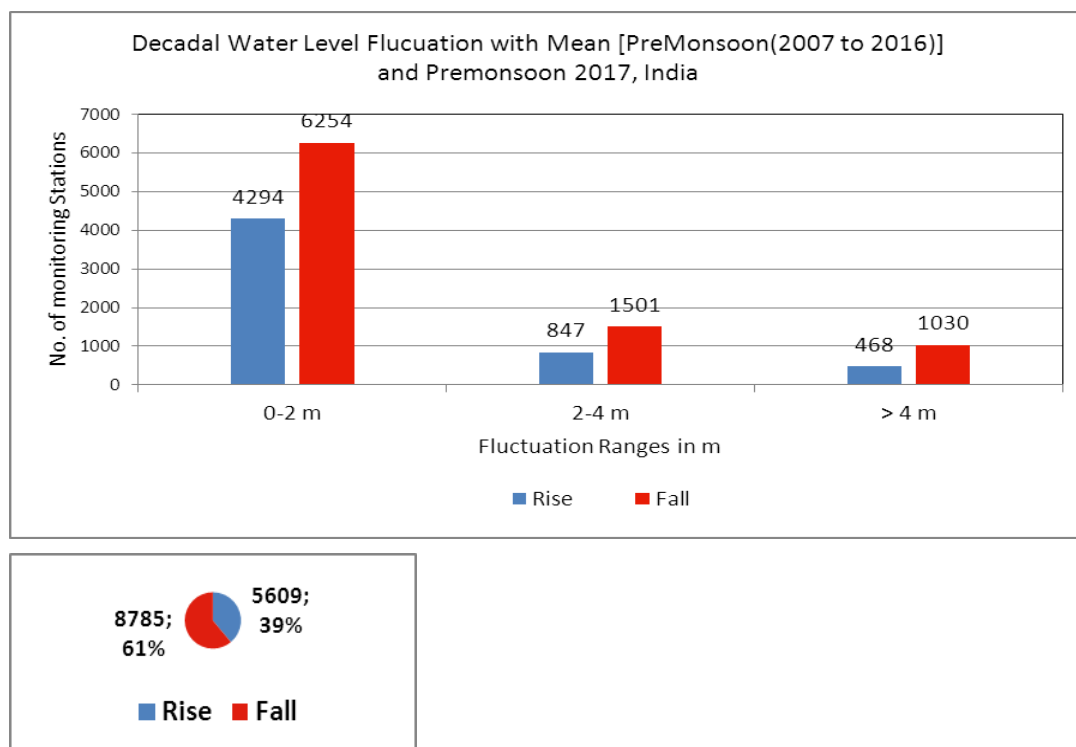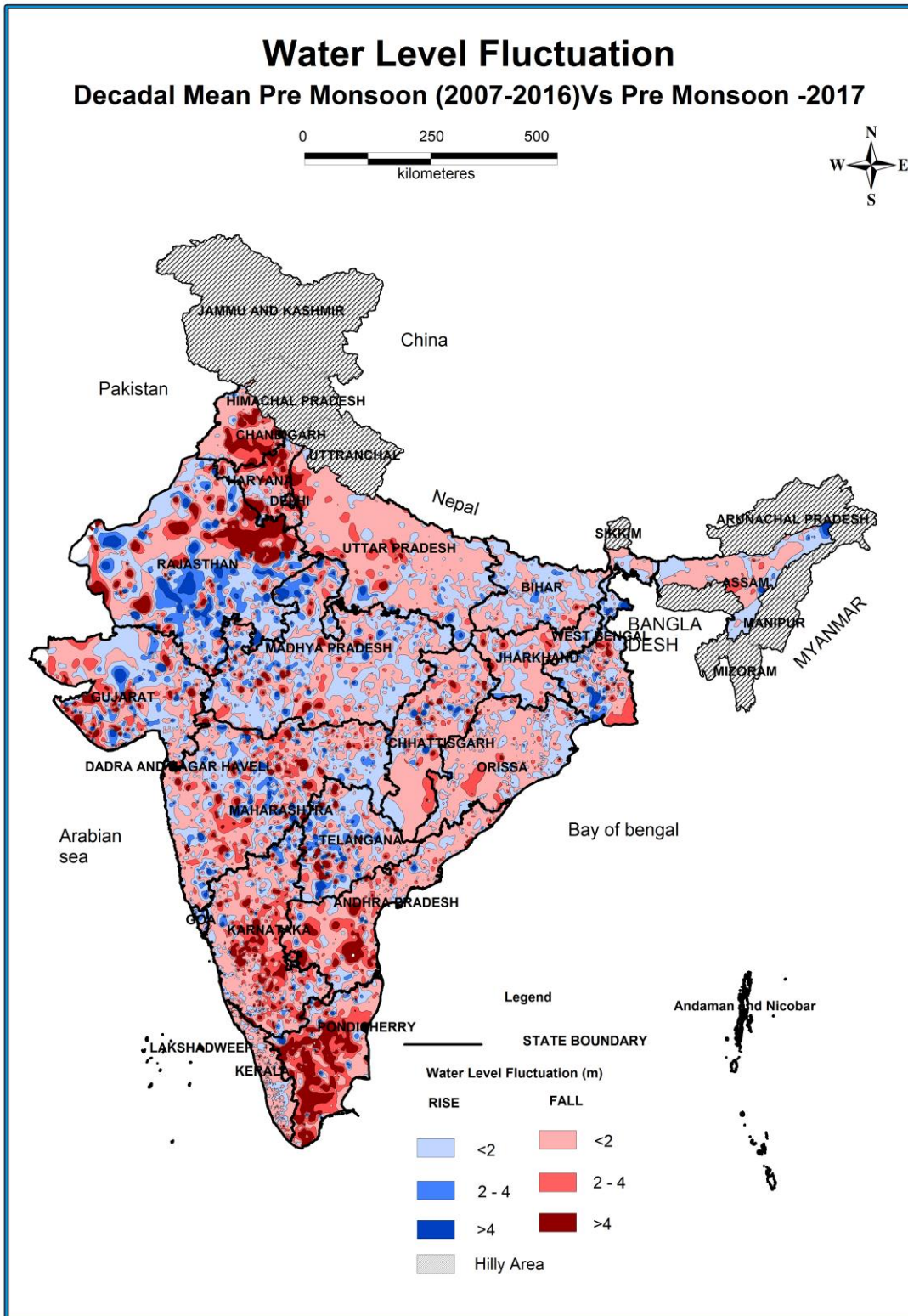
4.0 State-wise scenario of ground water level and comparison with previous year water level as well as change with respect to decadal average has been discussed in the following section.

4.01 Andhra Pradesh

Depth to Water Level - Premonsoon 2017

In the state of Andhra Pradesh very shallow water level ranging between 0-5 m bgl was observed in about 43% of the wells monitored. Shallow water level range is observed along the coastal tract of the state. The depth to water level between 5-10 meters has been observed in 41 % wells mainly in the southern, central and western parts of the state. Depth to water level ranging between 10-20 meters has been observed in 15% wells mainly in

the southern parts. Water level of more than 20 m bgl has been observed in less than 1% well. The depth to water level in the state ranges upto 49.30 m bgl in Prakasham district.
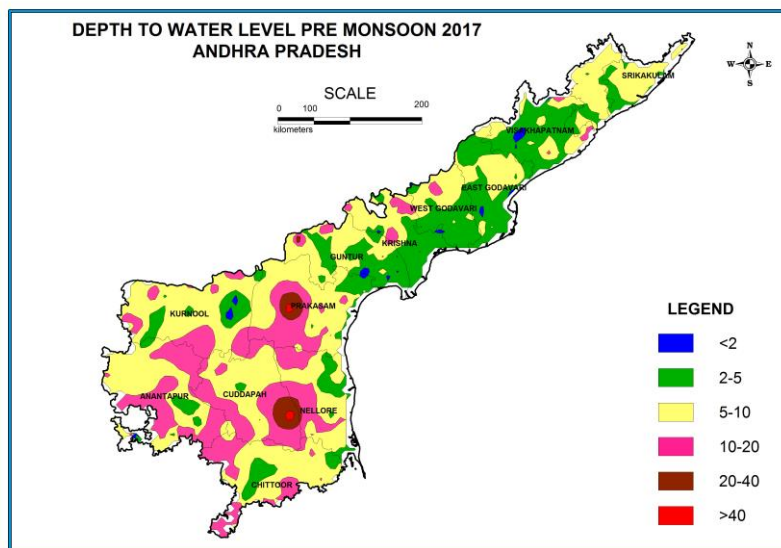
Water Level Fluctuation (Premonsoon 2017 to Premonsoon 2016)

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that about 49% of the wells analysed are showing fall in water level and 45% wells are showing rise in water level. 6% wells show no change in water level. Out of this 45% rise, 33% wells have shown a rise in 0-2 m range. In the fall category, about 37% of the wells show fall in 0-2 m range. Rise and fall is in the range of 0-2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2006 2016) to assess the rise/fall in water level during current year with respect to long term average of the corresponding period. About 25 % of analysed wells have shown a rise in water level. Out of this 20% of the wells have shown rise in the range of 0 to 2 m. About 75% wells have shown fall in water level, out of which 53% wells have shown fall in the range of 0 to 2 m and 14 % wells have shown fall in 2- 4 m and 8% wells shows fall of more than 4 m.

4.02 Arunachal Pradesh

Depth to Water Level - Premonsoon 2017

In general depth to water level scenario in the state depicted water level in the range of 0 to 5 m bgl at about almost 70 % of the wells monitored.

The depth to water level in the state ranges upto 10.82 m bgl in East Siang district.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level of Premonsoon 2017 when compared to that of Premonsoon 2016 shows that there is rise in water level in the state. About 58 % of the wells analysed show a rise in water level. 42% wells show decline in water level and all the wells lies in 0-2 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2006-2016) and it is observed that 75% of the wells analysed show rise in water level whereas only 25% shows fall in water level. Both rise and decline are in the range of 0-2 m.

4.03 Assam

Depth to Water Level - Premonsoon 2017

In general depth to water level scenario in the state depicted a water level in the range of 0 to 10 m bgl at almost 100 % of the wells monitored. 60 % wells recorded water level between 2-5 m bgl and 26% wells show water level between 5-10 m bgl.

A shallow water level within 2 m bgl is recorded in 13% wells monitored in few districts. The maximum

depth to water level has been recorded as 14.75 m bgl in Dhubri district.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level of Premonsoon 2017 when compared to that of Premonsoon 2016 shows that there is both rise and fall in water level in the state. About 47 % of the wells analysed show rise in water level. Out of this, 43% of the wells showing rise in water level in less than 2 m range. A rise of 2-4 m is observed in 3 % of the wells analyzed. About 49 % of wells analysed have shown fall in water level where 46 % of the wells shows fall in the range of 0-2 m.

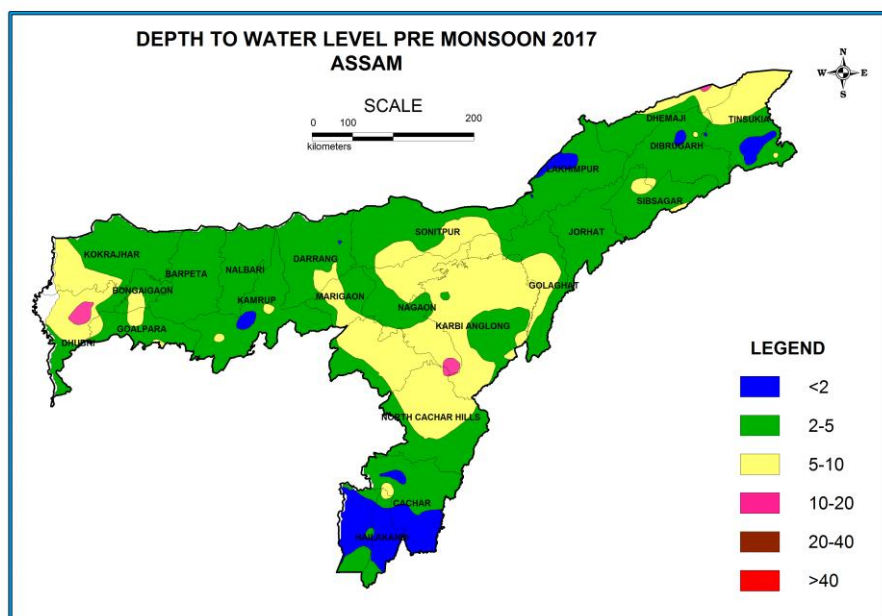**Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)**

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2007-2016) and it is observed that out of 164 wells analyzed 43 % show a rise in water level whereas 56% show a fall in water level. 38% wells show rise in the range of 0-2 m and 51% wells show fall in the range of 0-2 m. Rise and fall is in 0-2 m range.

4.04 Bihar

Depth to Water Level – Premonsoon 2017

During Premonsoon 2017 water level measurement, a total of 660 wells have been monitored. Only 3 % of the well shows water level in the range 0-2 m bgl in small isolated patches. In general, water level ranges in the 2-10 m bgl in the state, almost 90 % wells falls in this range. 46 % of the wells are showing water level in the range 2-5 m bgl, 47% of the wells analysed are showing water level in the range of 5-10 m bgl. In major parts of the state water level falls within 2-10 m bgl. 4% of the wells are showing water level in the range 10-20 m bgl. The maximum depth to water level has been recorded as 14.73 m bgl in Bhagalpur district.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that in general there is rise in water level in the state. About 68 % of the wells analysed are showing rise in the water level. Out of this, 56 % wells have shown a rise in 0-2 m range. 17% wells shows fall in water level in the range of 2-4 m. Only 17% wells show rise in water level , out of which about 16% of the wells analysed are showing rise in the water level mostly in the range of 0 -2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2007 to 2016) and it indicates that out of 551 wells analyzed, only 33 wells show a rise in water level whereas rest 67% show a fall in water level. Out of 33% rise, 30% wells fall in 0-2 m range, whereas, out of 67% fall, 57% wells show fall in 0-2 m range.

4.05 Chandigarh

Depth to Water Level – Premonsoon 2017

In general depth to water level scenario in the UT of Chandigarh depicted around 17% monitoring stations recorded water level between 2-5 m bgl. Another 33 % wells recorded water level between 5-10 m bgl, 25% wells show water level between 10-20 m bgl and 25% in 20-40 m bgl. The maximum depth to water level has been recorded as 28.75 m bgl.

Water Level Fluctuation – Premonsoon 2017 to Premonsoon 2016

Water level of Premonsoon 2017 when compared to that of Premonsoon 2016 shows that there is predominantly rise in water level in the state. About 60% of the wells analysed show a rise in water level. Out of this, 50% of the wells showing rise in water level in less than 2 m range and 10% wells show rise in 2-4 m range. About 40% of wells analysed have shown decline in water level, out of which 20% wells show fall in 0-2 m range and another 20% in 2-4 m range.
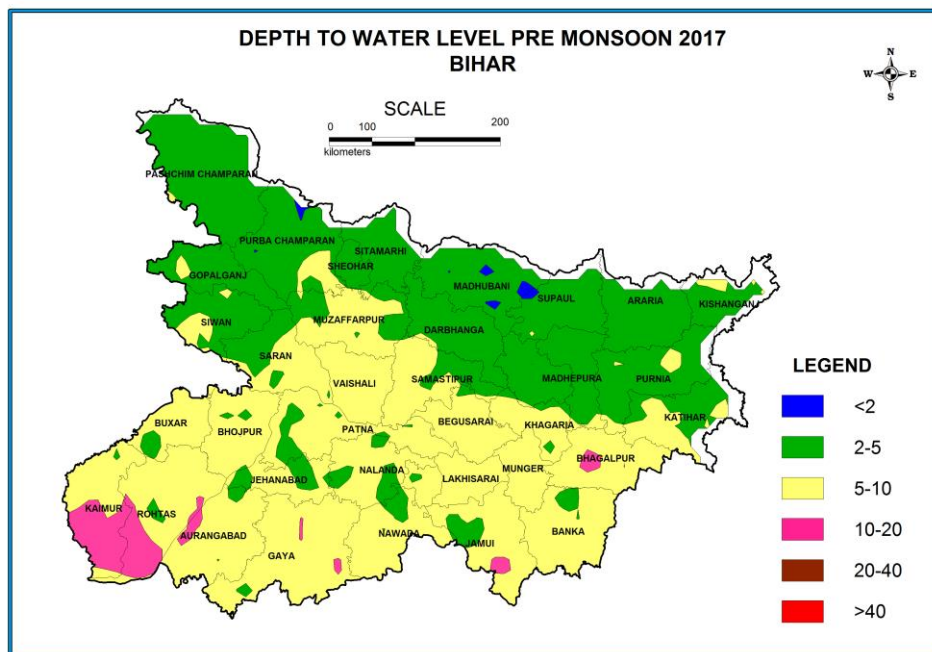
Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2007-2016) and it shows that there is predominantly fall in water level in the UT. Only 36 % of the wells analysed show rise in water level and 64% shows decline in water level. Out of 64% in the fall category, 55% wells fall in the 0-2 m range and 9% each in 2-4 range.

4.06 Chhattisgarh

Depth to Water Level – Premonsoon 2017

During Premonsoon 2017 water level measurement, a total of 623 monitoring wells has been analysed. More than 80% of the wells analysed fall in the range of 5-20 m bgl. Only 1% of the wells analysed show water level in the range of 0-2 m bgl, 15% wells show water level in 2-5 m bgl and about 54 % wells fall under the category of 5-10 m bgl. About 26% wells show water levels in the range of 10-20 m bgl. The maximum water level measured is 54.80 m bgl in Bilaspur District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that in general there is fall in water level in the state. About 79 % of the wells analysed are showing fall in water level. Out of this, 50 % wells have shown a decline in 0-2 m range and 16% wells show decline 2- 4 m range. 20% wells shows rise in water level, out of which about 13 % of the wells analysed are showing rise in the water level mostly in the range of 0-2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

When compared the decadal mean water level (Premonsoon 2006 to 2016) with Premonsoon 2017, it has been observed that entire state shows decline in water level. Only about 27% of observation wells are showing a rise in water level, out of which 18% wells are showing rise in less than 2 m range. Fall in water level as compared to the decadal mean is observed in 73% of the analysed wells. Almost 51% of the analysed wells are showing fall in the range of 0-2 m, 16 % in 2-4 m range and 7% wells show fall in more than 4 m range.

4.07 Delhi

Depth to Water Level – Premonsoon 2017

The depth to water level recorded in the state of Delhi during Premonsoon 2017 ranges from 1.84 m bgl to 58.89 m bgl (South District). It is observed that only 2% of the wells have shown water level in the range of 0-2 m bgl. About 21 % of the wells analysed have shown water level in the range of 2-5 m bgl, about 26% of the wells have shown water level in the range of 5-10 m bgl and 27 % wells show water level in the range of 10-20 m bgl. Deeper water level in the range of 20-40 m bgl and more than 40 m bgl are shown by 16% & 9% of the wells analysed respectively. It is observed that Southern parts of Delhi show deeper water levels of more than 20 m bgl.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level of Premonsoon 2017 when compared to water level of Premonsoon 2016 in the state indicates there is fall in water level in the entire state. About   % of the wells analysed have recorded a rise in water level, out of which 24 % of analysed wells have recorded a rise in the range of 0 to 2 m. About 72% of the wells have shown decline in water level, out of which 64% fall in the range of 0 to 2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation analyses of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007-2016) indicates that in general there is fall in water level in the state. 77 % of analysed wells have shown decline in water level. Out of this, 45 % of the wells have shown fall in the range of 0-2 m. About 17% wells have shown a decline in 2-4 m and 16% wells show decline of more than 4 m. 23% wells show rise in water level, out of which 17% show rise in 2-4 m range.

4.08 Goa

Depth to Water Level - Premonsoon 2017

The depth to water level recorded in the state of Goa during Premonsoon 2017 ranges from 2.08 m bgl to 18.84 m bgl in North Goa. It is observed that out of 71 monitored wells, none of the wells show less than 2 m bgl water level, 41% wells show 2 to 5 m bgl water level, 48% wells show 5 to 10 m bgl water level and 11% wells show 10 to 20 m bgl water level.

Water Level Fluctuation – Premonsoon 2017 to Premonsoon 2016

Water level of Premonsoon 2017 when compared to water level of Premonsoon 2016 in the state indicates both rise and fall in water level in the state. About 43 % of the wells analysed have recorded a rise in water level and the analysed wells have recorded a rise in the range of 0 to 2 m. 57% wells shows fall in water level and mostly in the range of 0-2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007-2016) indicates both rise and fall in water level in the state. About 59% of analysed wells have shown a rise in water level. Out of this 52% of the wells have shown rise in the range of 0 to 2 m. About 41 % wells have shown a fall in water level and all the wells fall in the range of 0-2 m.

4.09 Gujarat

Depth to Water Level - Premonsoon 2017

The depth to water level recorded in the state of Gujarat during Premonsoon 2017 ranges up to 60.69 m bgl in Banaskantha district. In general, depth to water level ranges between 5-20m bgl. The depth to water level for 3% of the wells analysed have shown water level in the range of 0-2 m bgl, 15 % of the wells have shown water level in the range of 2-5 m bgl. About 34% of the wells analysed have
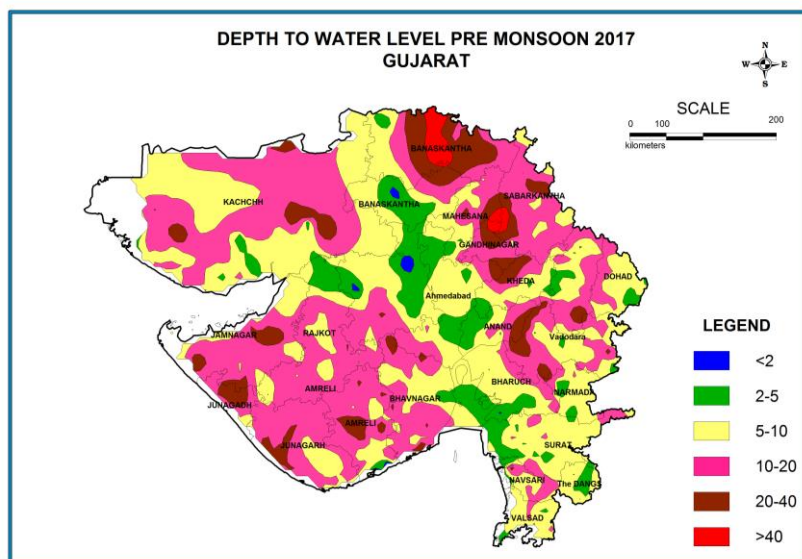
shown water level in the range of 5-10 m bgl and 36 % of the wells have shown water level in the range of 10-20 m bgl. Deeper water level in the range of 20-40 m bgl and more than 40 m bgl are shown by about 12% of the wells analysed. Water Level ranges upto 60.69 m bgl in Banaskantha District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 when compared to Premonsoon 2016 shows that in general there is both rise and fall in water level in the state. About 47 % of the wells analysed shows rise in the water level.

Out of this, 31% wells have shown a rise in the range of 0-2 m. About 7% of the wells have shown rise in 2- 4 m range and about 9% wells have shown rise in water in more than 4 m. About 42% of the total wells have shown a fall in water level, out of which 27% wells have shown a fall in 0-2 m range. 9% wells show fall in 2-4 m range and another 6% wells in more than 4 m range. 11% of the wells show no change in water level.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2007 to 2016) to assess the rise/fall in water level of this year with respect to long term average of the corresponding period. 38% of monitoring wells shows rise in water level and 59 % wells are showing fall in water level. About 28% of wells show rise in 0-2 m range, 8% wells shows rise in the 2-4 m range and 3% wells are showing rise in the range of more than 4 m. 35 % of the wells have shown fall in water level in the range of 0-2 m. Another 12% wells show fall in 2-4 m range and almost 12% wells show fall in more than 4 m range.

4.10 Haryana

Depth to Water Level - Premonsoon 2017

During Premonsoon 2017, the depth to water level in the state of Haryana varies from 0.87 to 78.43 m bgl in Bhiwani district. In Haryana, water level generally varies in the range of 5 - 20 m bgl in which maximum wells falls. About 4% of wells monitored have reported water level up to 2 m bgl. About 21% of the wells monitored falls within the range of 2-5 m bgl. Another 27% of the wells monitored falls within the range of 5-10 m bgl. Moderately deep water level i.e. 10-20 m bgl occurs in major parts of the State, observed in almost 25% of the monitored wells. Deep water level i.e. 20-40 m bgl is observed in 19% of the monitored wells. Very deep water levels more than 40 m bgl are also observed in almost 4% of the monitored wells.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

The water level data of Premonsoon 2017 when compared with Premonsoon 2016 indicates that there is rise in water level in about 35 % of the wells monitored, out of which 34% of the wells monitored show rise in the range between 0-2 m. Decline in
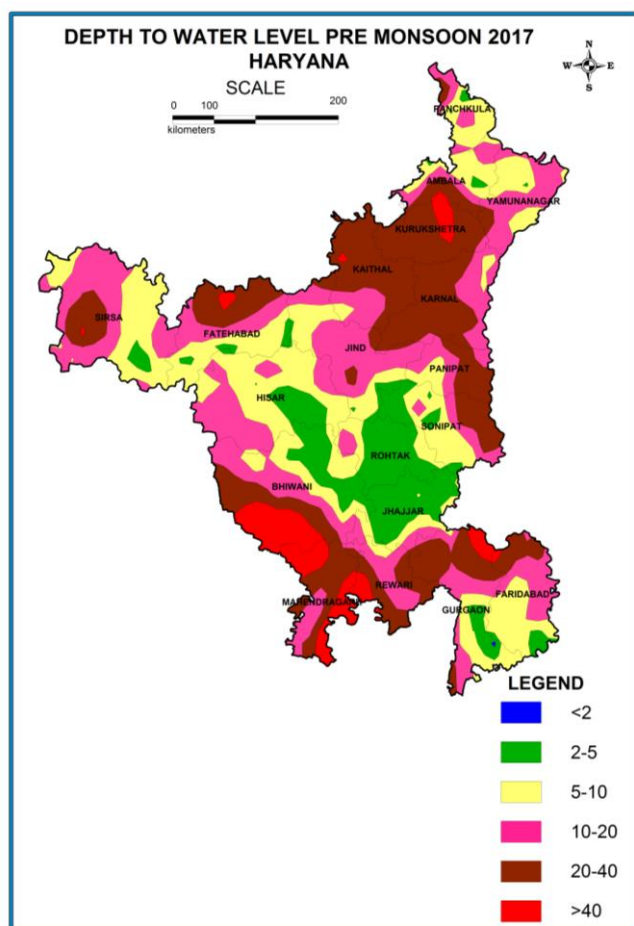
water level has been recorded in 64 % of the wells, mostly in 0-2 m range, in 53% of wells. Rise and fall is mainly restricted to 0-2 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 when compared with the average water level of past decade (Decadal mean Premonsoon 2007-2016) indicates in general there is decline in water level in the entire state. About 31% of monitored wells have shown rise in water level. The rise of 0-2 m has been observed in about 28% of the wells analysed. About 69% of wells analysed have shown fall in water level. Fall in the range of 0-2 m has been recorded in 37% of monitored wells,

4.11 Himachal Pradesh

Depth to Water Level - Premonsoon 2017

The depth to water level in the state of Himachal Pradesh during Premonsoon 2017 varies from 0.36 m bgl to 28.23 m bgl in Sirmaur district. About 45% of the wells show water level of less than 5 m bgl. Out of these almost 5% of the wells are showing water level in the range of 0-2 m bgl, another 40 % of the wells show water level in the range of 2-5 m bgl. About 27% of the wells are showing water level in the range of 5 -10 m bgl while another 20% of the wells are showing water level in the range of 10-20 m bgl. Deep water levels of more than 20 m are observed only at 8% monitoring stations.

Water Level Fluctuation – Premonsoon 2017 to Premonsoon 2016

The water level data of Premonsoon 2017 when compared with Premonsoon 2016 indicates that there is fall in water level in the entire state. Only about 21 % of the wells analysed show rise in water level, out of which 18% of the wells monitored show rise in the range between 0-2 m. Decline in water level has been recorded in 79% of the wells and out of which, 62 % show fall in 0-2 m range and another 15% show fall in 2-4 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2007 to 2016) to assess the rise/fall in water level of this year with respect to long term average of the corresponding period. About 38% of monitoring wells show rise in water level and rest 62% wells show fall in water level. Out of 38 % wells in the rise category, about 32% of the monitored wells show rise in the 0-2 m range. 62 % of the wells have shown decline in water level, out of which 50% falls in the range of 0-2 m range and 10 % in 2-4 m range.

4.12 Jammu & Kashmir

Depth to Water Level - Premonsoon 2017

It is observed that out of the total 230 wells monitored, water level ranges from 0.36 to 31.90 m bgl. Water level varies from 0-2 m bgl in 13% of the wells. About 53% wells have shown 2-5 m bgl water level, mainly in outer plain areas. About 24% of the wells analysed have shown water level in the range of 5-10 m bgl. About 7% wells have shown water level in the range of 10-20 m bgl.

About 4% wells show deeper water level of 20-40 m bgl water level and the remaining 4% wells have more than 40 m bgl water level.

Water Level Fluctuation – Premonsoon 2017 to Premonsoon 2016

The water level data of Premonsoon 2017 when compared with Premonsoon 2016 indicates that there is fall in water level in the entire state. Only about 15% of the wells monitored show rise in water level, out of which 14% of the wells monitored show rise in the range between 0-2 m. Decline in water level has been recorded in 85% of the wells, out of which 57% shows decline in 0-2 m range. Rise and decline of water level in mainly restricted upto 2 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation analyses of water level of Premonsoon 2017 with the decadal mean (Premonsoon 2007- 2016) indicates that there is fall in water level in the state and about 63% of analysed wells have shown a fall in water level. Out of this 54% of the wells have shown fall in the range of 0 to 2 m. About 37% wells have shown a decline in water level, out of which 35% of the wells have shown fall in the range of 0 to 2 m.

4.13 Jharkhand

Depth to Water Level - Premonsoon 2017

During Premonsoon 2017, water level in the state varies in the range of 5-10 m bgl. Out of the total 230 wells analysed, less than 11% of wells have shown depth to water level in the range of 2 to 5 m bgl and majority of the wells, 74% of the wells analysed are showing water level in the range of 5-10 m bgl. Deeper water levels of 10-20 m are observed in about 15% wells.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

In the state of Jharkhand there is fall in water level in Premonsoon 2017 as compared to Premonsoon 2016. About 70% of the wells analysed shows fall in the water level. Out of this 59% wells have shown a fall in 0-2 m range. Only 29% of the wells analysed show rise in water level, out of which 22% show fall in the range of 0-2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)
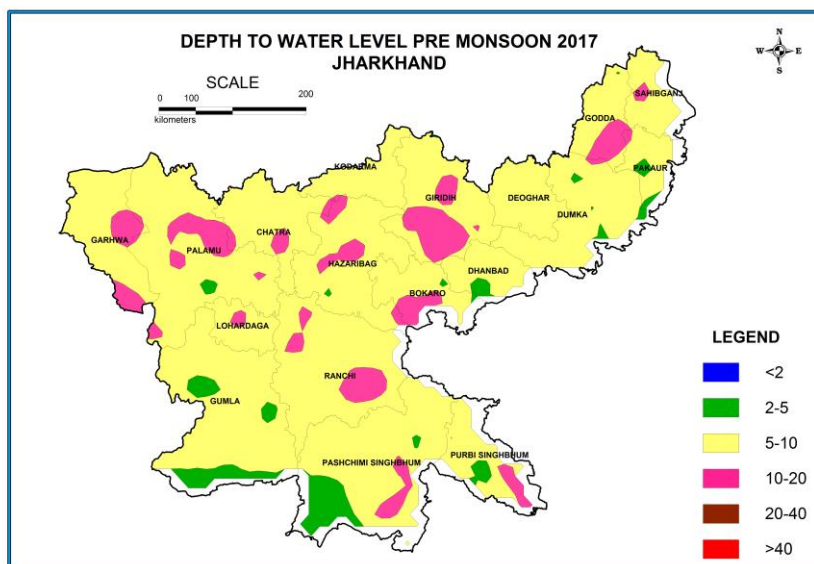
The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2007- 2016 to assess the rise/fall in water level during current year with respect to long term average of the corresponding period. About 41% of analysed wells have shown a rise in water level. Out of this 33% of the wells have shown rise in the range of 0 to 2 m, 6% wells have shown rise in the range of 2 to 4 m. About 59% wells have shown a fall in water level, out of which 51% wells have shown fall in the range of 0 to 2 m and 7 % in 2-4 m range.

4.14 Karnataka

Depth to Water Level-Premonsoon 2017

In the state of Karnataka, very shallow water level ranging between 0-2 m bgl has been observed in about only 6% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 5-20 m bgl, as almost 85 % of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in 19 % of the monitored wells, whereas, 43 % wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in almost 32 % wells. The depth to water level in the state ranges upto 30.70 m bgl in Bagalkote District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that there is rise in water level in about only 34% of the wells and fall

in about 54% of the wells. 23% wells have shown a rise in 0-2 m range, 6% of the wells have shown a rise in 2-4 m range and 5% wells show a rise of more than 4 m range. 36% wells have shown a fall in the range of 0 - 2 m, 10% wells have shown decline in the range of 2-4 m range and 8% in the range of more than 4 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007-2016) indicates that there is predominantly fall in water level in the state. About 69% of analysed wells have shown a decline, mostly in the range of 0-2 m, whereas, only 30% wells have shown a rise in water level. 1% well shows no change in water level.

**4.15 Kerala**

Depth to Water Level - Premonsoon 2017

In the state of Kerala, very shallow water level ranging between 0-2 m bgl has been observed in about only 6% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 2-20 m bgl, as almost 70 % of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in 28 % of the monitored wells, whereas, 42 % wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in almost 22 % wells. The depth to water level in the state ranges upto 56.20 m bgl in Pallakad District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that there is

DEPTH TO WATER LEVEL PRE MONSOON 2017 KERALA

LEGEND

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10-20
20-40
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fall in water level in the state. About 41% of the wells show rise in water level and 58% wells show decline. 1% of the well shows no change in water level. 38% wells have shown a rise in 0-2 m range and out of 58% wells showing fall, 51% shows fall in 0-2 m range. Rise and fall is in the range of 0-2 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 when compared with the decadal mean (Premonsoon 2007 -2016) indicates that there is both rise and fall in water level in the state. About 37% of analysed wells have shown a rise in water level, of which 34% of the wells show rise in the range of 0 to 2 m. About 63% wells have shown a fall in water level out of which 56% wells shows fall in the range of 0-2 m. Rise and fall is mainly restricted to 0-2 m only.
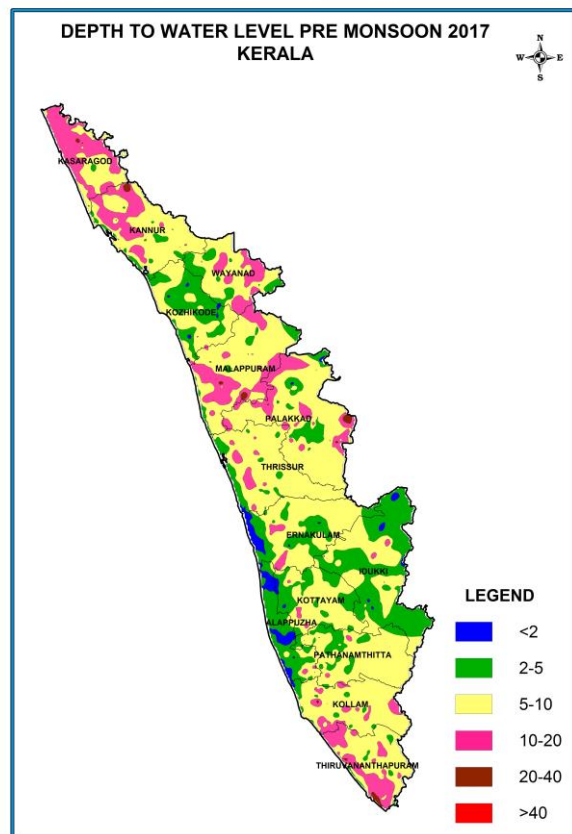
4.16 Madhya Pradesh

Depth to Water Level - Premonsoon 2017

The depth to water level during Premonsoon 2017 in Madhya Pradesh varies from 0.85 to 49.20 m bgl in Ratlam district. In general the depth to water level ranges from 5 m to 20 m bgl in most parts of Madhya Pradesh. Less than 1 % monitoring wells are showing water level in 0-2 m bgl range. About 12 % of monitoring wells
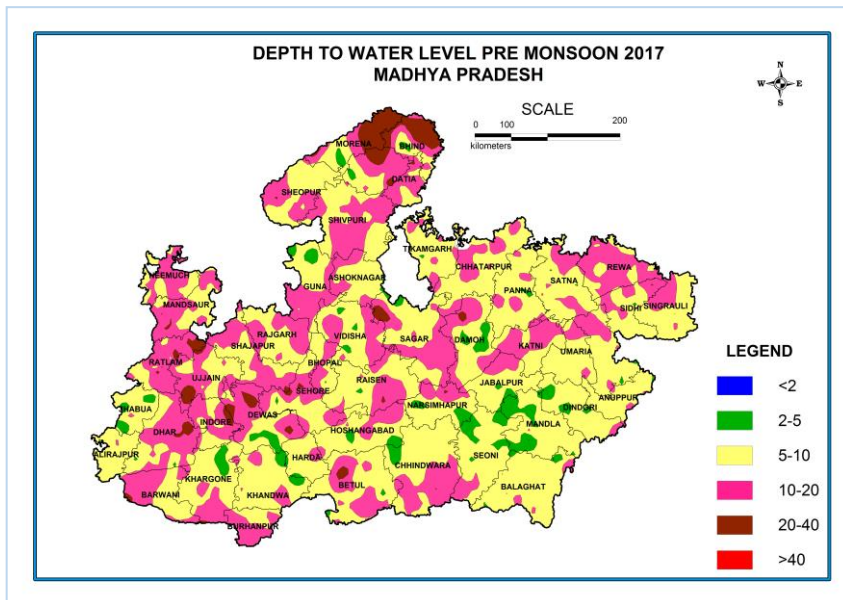
are showing water level in 2-5 m bgl range. Depth to water level ranging between 5-10 m bgl was observed in 49% wells and about 34% wells show water level ranging more than 10 m bgl located mostly in pockets in the entire state. Water levels of more than 20 m bgl are observed at 5% wells in northernmost parts of the state in Bundelkhand region.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that there is rise in water level in the entire state. About 60% of the wells show rise in water level and 38% of the wells are showing fall. 2% well show no change in water level. 46% wells have shown a rise in 0-2 m range. About 31% wells show fall in the range of 0-2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007 -2016) indicates that about 50% of analysed wells have shown a rise in water level, of which 37% of the wells show rise in the range of 0 to 2 m. Another 50% wells have shown a decline in water level, out of which 39% falls in the range of 0-2 m. Rise and fall is in the range of 0-2 m.

4.17 Maharashtra

Depth to Water Level - Premonsoon 2017

In the state of Maharashtra, very shallow water level ranging between 0-2 m bgl has been observed in about only 3% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 5-20 m bgl, as almost 80 % of the wells monitored fall in this
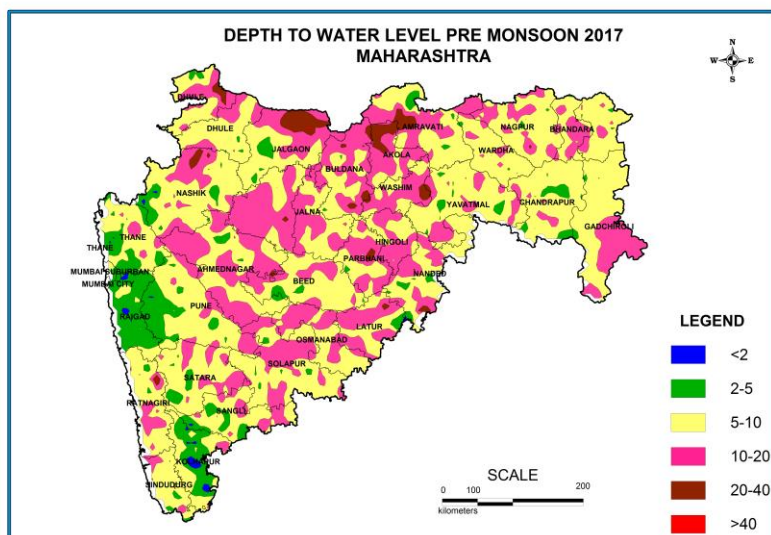
range. Depth to water level of 2-5 m bgl is observed in 16 % of the monitored wells, whereas, 47% wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in almost 30 % wells and 3% wells show very deep water level of more than 20 m. The depth to water level in the state ranges upto 60 m bgl in Ratnagiri District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that there is rise in water level in about 55% of the wells and fall in about 39% of the wells. 6% wells show no change. 35% wells have shown a rise in the range of 0-2 m, about 12% of the wells have shown rise in the range of 2-4 m and 9% wells show rise of more than 4 m. 39% of the wells have shown fall in water level, out of which 28% wells show in in 0-2 m range, 7% in 2- 4 m range and 4% in more than 4 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuations of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007-2016) show that about 43% of analysed wells have shown a rise in water level, out of which, 30% of the wells show rise in the range of 0 to 2 m and 8% wells have shown rise in the range of 2-4 m. About 57% wells have shown a decline in water level, out of which, 39% of the wells fall in the range of 0-2 m.

4.18 Meghalaya

Depth to Water Level – Premonsoon 2017

In general depth to water level scenario in the state depicted a water level in the range of 2 to 5 m bgl.and 70% of the wells fall in this range. About 19% monitoring stations recorded water level within 2 m bgl and another 71% wells recorded water level between 2-5 m bgl. 10 % wells shows water level in 5-10m bgl. Water level varies upto 5.32 m bgl.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows only about 14% of analysed wells have shown a rise in water level, and 86% wells show fall. Fall is predominant in the state. Out of 86% of the wells showing fall, all falls in the range of 0 to 2 m.

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Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuations of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007-2016) shows that only about 30% of analysed wells have shown a rise in water level, and 70% wells show fall. Fall is predominant in the state. Out of 70% of the wells showing fall, all wells falls in the range of 0 to 2 m.

4.19 Odisha

Depth to Water Level - Premonsoon 2017

In the state of Odisha, very shallow water level ranging between 0-2 m bgl has been observed in about only 7% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 2-10 m bgl, as almost 85 % of the wells monitored fall in this range. Depth to water level of
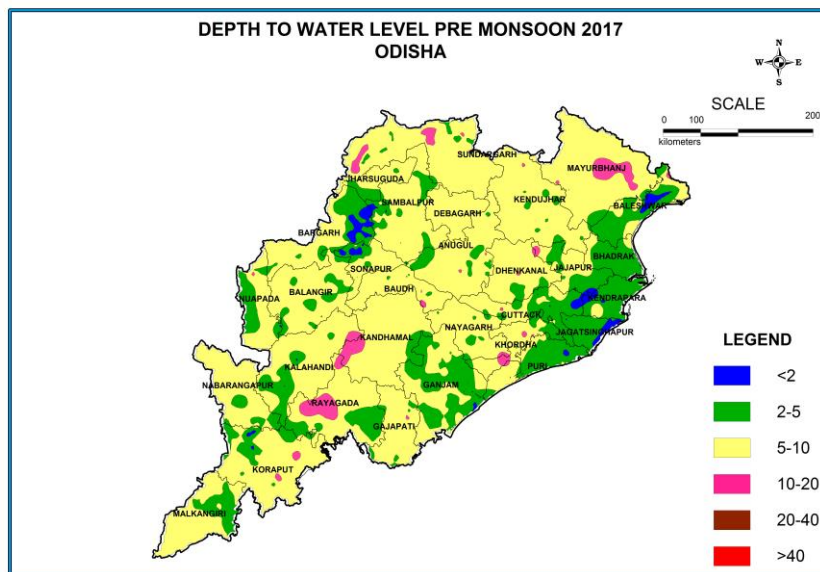
2-5 m bgl is observed in 34 % of the monitored wells, whereas, 54% wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in only 4 % wells. The depth to water level in the state ranges upto 17.42 m bgl in Anugul District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared with that of Premonsoon 2016. The analysis shows that there is both rise and fall in water level in the state. About 50% of the wells shows fall in water level, out of which about 46% wells have shown a fall in 0-2 m range. About 47% wells show rise in water level, out of which 45 % is in 0-2 m range. 2% well shows no change.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007-2016) indicates that there is predominantly fall in water level in the state. About 60% of analysed wells have shown a decline in water level and 39% wells have shown a rise in water level. Out of the wells showing rise, 36% is in the category of 0-2 m and similarly in the decline category 53% wells lies in the 0-2 m range.

4.20 Pondicherry

Depth to Water Level – Premonsoon 2017

During Premonsoon 2017, a total of 6 wells have been monitored. All the wells show water level upto 5 m bgl.

Water Level Fluctuation – Premonsoon 2017 to Premonsoon 2016

The water level data of Premonsoon 2017 when compared with Premonsoon 2016 indicates that there is rise in water level in 67% of the wells analysed and 33% show decline in water level.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

When compared the decadal mean water level (Premonsoon 2006 to 2016) with Premonsoon 2017, 71% of observation wells are showing rise in water level, all in the range of 0-2 m. 29% show decline in water level and all in 0-2 m range.

4.21 Punjab

Depth to Water Level - Premonsoon 2017

In the state of Punjab, very shallow water level ranging between 0-2 m bgl has been observed in about only 3% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 5-40 m bgl, as almost more than 80%of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in 14 % of the monitored wells, whereas, 27% wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in almost 28% wells and 26% wells show very deep water level of more than 20 m. The depth to water level in the state ranges upto 45.74 m bgl in Patiala District.

DEPTH TO WATER LEVEL PRE MONSOON 2017
PUNJAB

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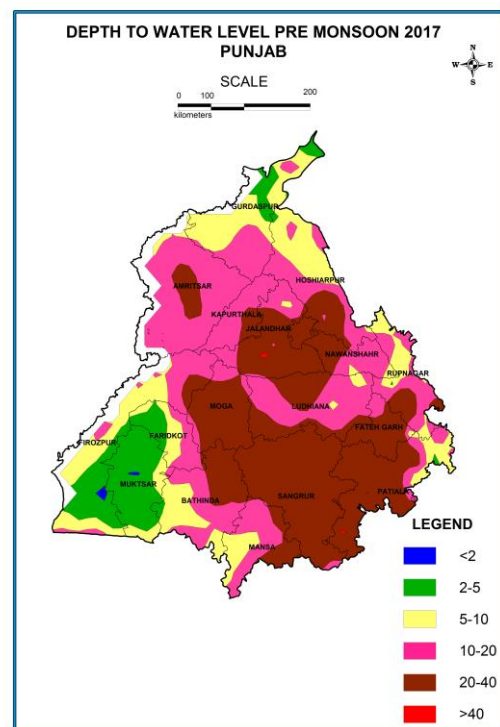
Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

The comparison of water level data of Premonsoon 2017 and Premonsoon 2016 shows that there is decline in water level in the entire state. 82% of the wells show fall in water level, out of which 65% wells show decline of 0-2 range. 10% wells analysed show fall in water level in the range of 2-4 m. Only 18% wells rise in water level, out of which 15% wells show rise in 0-2 m range. Rise and fall in restricted to 0-2 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 with respect to average water level of past decade (Decadal mean Premonsoon 2007-2016) indicates decline in water level in major parts of the State. About 85% of the wells have shown decline, of which 20% wells show water level rise in the range of 0-2 m. Fall in water level is observed in 75% of the wells. Out of this, 49% of the wells analysed is showing fall in the range of 0-2 m, 17% of the wells showing fall of 2-4 m and 9% falls in more than 4 m range.

4.22 Rajasthan

Depth to Water Level - Premonsoon 2017

In the state of Rajasthan, very shallow water level ranging between 0-2 m bgl has been observed in about only 2% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 5-20 m bgl, as almost more than 50% of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in only 12% of the monitored wells, whereas, 24% wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in almost 25% wells and 18% wells show very deep water level of more than 20 m. More than 40 m water level is also seen in 19% wells analysed. The depth to water level in the state ranges upto 134.22 m bgl in Bikaner District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Comparison of water level of Premonsoon 2017 and Premonsoon 2016 in the state indicates that about 51% of the wells analysed have recorded a rise in water level, out of which 30% of analysed wells have recorded a rise in the range of 0 to 2 m, 10% of analysed wells have shown rise in the range of 2 to 4 m and 11% of the wells have shown rise more than 4 m. 48% of the wells have shown fall in water level, out of this, 35% have recorded fall in the range of 0 to 2 m,

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

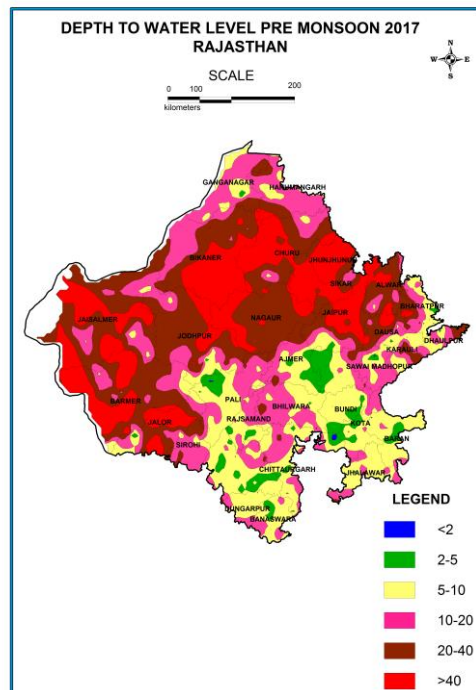The fluctuation of water level during Premonsoon 2017 with respect to Decadal mean (Premonsoon 2007 - 2016) indicates that there is both rise and fall in water level in the state of Rajasthan. About 50% of the analysed wells shows fall and another 50 % show rise in water level, mostly in the range of 0-2 m range.

4.23 Tamil Nadu

Depth to Water Level - Premonsoon 2017

In the state of Tamil Nadu, very shallow water level ranging between 0-2 m bgl has been observed in about only 2% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 5-20 m bgl, as almost more than 75% of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in 18% of the monitored wells, whereas, 39% wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in almost 33% wells and only 6% wells show very deep water level of more than 20 m. More than 40 m water level is also seen in less than 1% wells analysed. The depth

25

to water level in the state ranges upto 65.75 m bgl in Coimbatore District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level of Premonsoon 2017 when compared to water level of Premonsoon 2016 in the state indicates that there is predominantly fall in water level in the entire state. About 90% of the wells analysed have recorded a decline in water level, out of which 31% of analysed wells have recorded a fall in the range of 0 to 2 m, 26% of analysed wells have shown fall in the range of 2 to 4 m and 33% of the wells have shown fall of more than 4 m. Only About 10% of the wells have shown rise in water level,

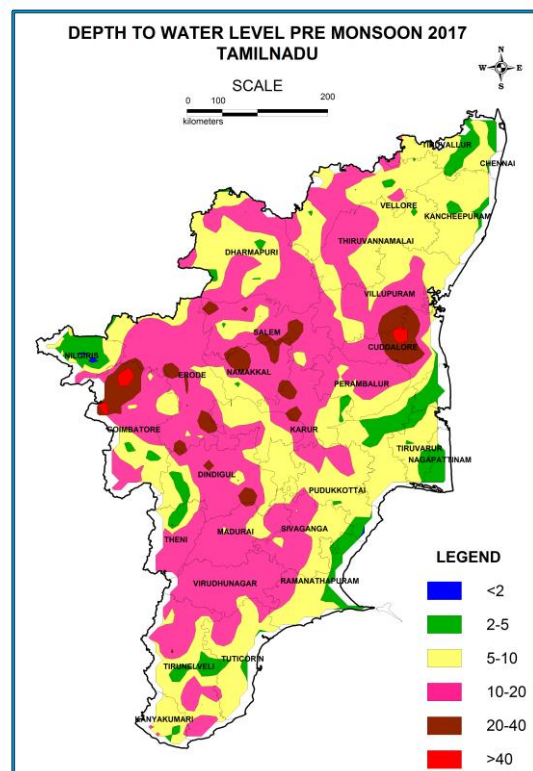**Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)**

The water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007 - 2016) indicates that there is in general decline in water level in the state. About 87% of analysed wells have shown decline in water level. Out of this, 35% of the wells have shown fall in the range of 0-2 m, 24% of analysed wells have shown fall in the range of 2 - 4 m and 28% of the wells have shown fall of more than 4 m. Only about 13% of the wells have shown a rise in water level, out of which 10% of the wells have shown fall in the range of 0-2 m,

4.24 Telangana

Depth to Water Level - Premonsoon 2017

In the state of Telangana, very shallow water level ranging between 0-2 m bgl has been observed in about only 2% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 5-20 m bgl, as almost 70% of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in 18% of the monitored wells, whereas, 42% wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in majority of the wells, ie 30% wells and 7% wells show very deep water level of more than 20 m. More than 40 m water level is also seen in less than 2% wells analysed. The depth to water level in the state ranges upto 69.40 m bgl in Mahbubnagar District.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water level of Premonsoon 2017 when compared to that of Premonsoon 2016 shows that there is dominantly rise in water level in the state. About 70% of the
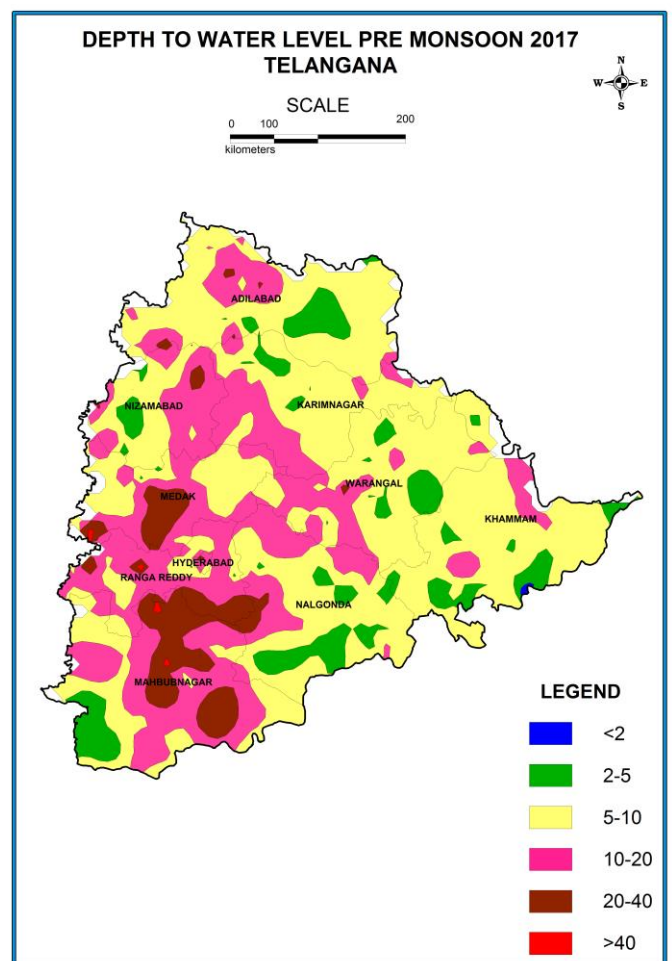
wells analysed have recorded a rise in water level, out of which 32% of analysed wells have recorded a rise in the range of 0 to 2 m, 17% of analysed wells have shown rise in the range of 2 to 4 m and 21% of the wells have shown fall of more than 4 m. About 22% of the wells have shown decline in water level, out of this 15% of wells have recorded rise in the range of 0 to 2 m. 8% wells show no change in water level.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007 - 2016) indicates that there is in general both rise and fall in water level in the entire state. About 54% of analysed wells have shown rise in water level. Out of this, 35% of the wells have shown rise in the range of 0-2 m, 13% of analysed wells have shown rise in the range of 2 - 4 m. 46% of the wells have shown fall of water level, out of which 30% of the wells have shown rise in the range of 0-2 m.

4.25 Tripura

Depth to Water Level – Premonsoon 2017

In general depth to water level scenario in the state depicted a water level in the range of 0 to 10 m bgl. 25% wells show water level in less than 2 m bgl range, 43 % wells show water level in 2-5 m bgl and 32% wells show water level of 5-10 m bgl. Maximum water level of 6.37 m bgl is seen at North Tripura.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Comparison of water level of Premonsoon 2017 with Premonsoon 2016 shows that there is both rise and fall in water level in the state. 45% of the wells analysed show rise and another 50 % show fall in water level and all in the range of 0-2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The water level data of Premonsoon 2017 has been compared with decadal mean (Premonsoon 2007-2016) and it is observed that 69% show a rise in water level whereas 31% show a fall in water level. Both rise and fall is in the range of 0-2 m.

4. 26 Uttar Pradesh

### Depth to Water Level - Premonsoon - 2017

In the state of Uttar Pradesh, very shallow water level ranging between 0-2 m bgl has been observed in about only 2% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 2-10 m bgl, as almost more than 70% of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in 27% of the monitored wells, whereas, 45% wells

DEPTH TO WATER LEVEL PRE MONSOON 2017
UTTAR PRADESH

SCALE

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show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in majority of the wells, ie 22% wells and 4% wells show very deep water level of more than 20 m. The depth to water level in the state ranges upto 43.40 m bgl.
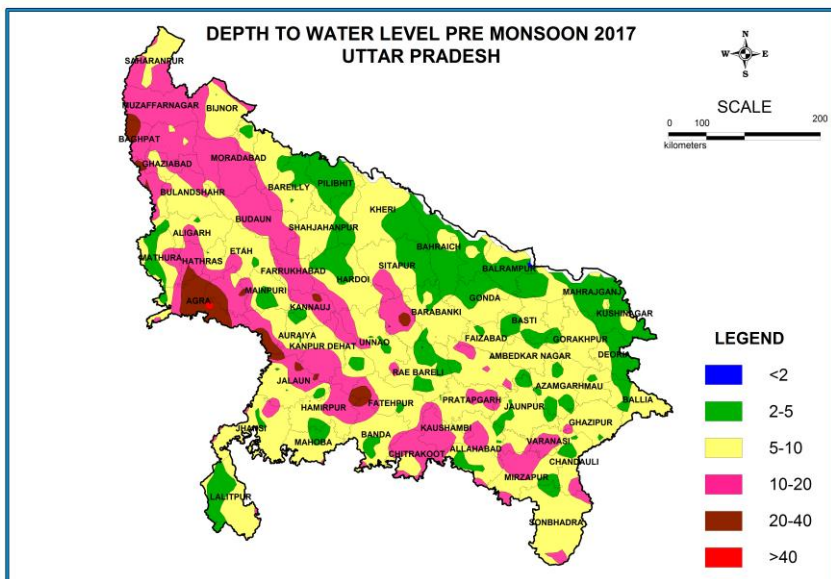
Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

Water levels of Premonsoon 2017 when compared to water level of Premonsoon 2016 in the state indicates that the entire state shows both rise and fall in water level. About 56% wells show decline in water level, out of which 40% wells have recorded a fall in the range of 0 to 2 m. About 43% of the wells have shown rise in water level, and mostly in the range of 0-2 m.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The fluctuation of water level during Premonsoon 2017 when compared with the Decadal mean (Premonsoon 2007-2016), indicates that there is in general fall in water level in the state. About 71% of analysed wells have shown fall in water level. Out of this 57% of the wells have shown fall in the range of 0-2 m, 10% of analysed wells have shown fall in the range of 2 - 4 m and 3% of the wells have shown fall more than 4 m. About 29% of the wells have shown a rise in water level and mostly in 0-2 m range.

4.27 Uttarakhand

Depth to Water Level - Premonsoon 2017

Uttarakhand state is mainly covered by hilly/ mountainous areas. About 85% of the area is hilly and has no appreciable ground water potential whereas about 15% of the state is plain where ground water is developed. Depth to water level in the range of 0-2 m is observed in 4% wells, 2-5 m bgl in 23% of the wells analysed, 43% of the wells show water level in the range of 5-10 m bgl and 26% in the range of 10-20

m bgl. Deeper water level of more than 20 m bgl is seen in 4% wells. In Nainital district, maximum water level of 34.40 m bgl is recorded.

Water Level Fluctuation - Premonsoon 2017 to Premonsoon 2016

The comparison of Premonsoon 2017 water level with Premonsoon 2016 reveals that rise in water level is observed in 47% of the wells analysed and decline at 50% wells. The rise in water level in the range of 0-2 m has been observed in 34% wells. The fall in water level in the range of 0-2 m has been observed in 37 % of wells. Rise and fall is restricted to 0-2 m range.

Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

The comparison of Premonsoon 2017 water level with decadal mean of (Premonsoon 2007 -2016) reveals that about 46% of the analysed wells have shown rise in water level. Out of this, rise in water level in the range of 0-2 m has been observed at 28% of wells. Majority of the wells, ie, 52% have shown decline in water level and out of these 35% wells fall in the range of 0-2 m and 15% in 2-4 m range.

4.28 West Bengal

Depth to Water Level – Premonsoon 2017

In the state of West Bengal, very shallow water level ranging between 0-2 m bgl has been observed in about only 4% of the wells monitored. In general depth to water level scenario in the state depicted a water level in the range of 2-20 m bgl, as almost more than 80% of the wells monitored fall in this range. Depth to water level of 2-5 m bgl is observed in 24% of the monitored wells, whereas, 43% wells show water level of 5-10 m bgl. Deeper water level of more than 10 m bgl is observed in 23% wells and 5% wells show very deep water level of more than 20 m. The depth to water level in the state ranges upto 32.75 m bgl in Murshidabad District.

Water Level Fluctuation–Premonsoon 2017 to Premonsoon 2016

Water level data of Premonsoon 2017 was compared to Premonsoon 2016 and the analysis shows that there is rise in water level in majority of the state. About 64% of the wells show rise in water level and 35% wells show fall in water level. Out of 64% rise, 51% wells have shown a rise in the range of 0-2 m, 11% of the wells have shown rise in the range of 2-4 m whereas 7% wells show rise in the range of more than 4 m. In the fall category, 31% wells analysed show decline in 0-2 m range.
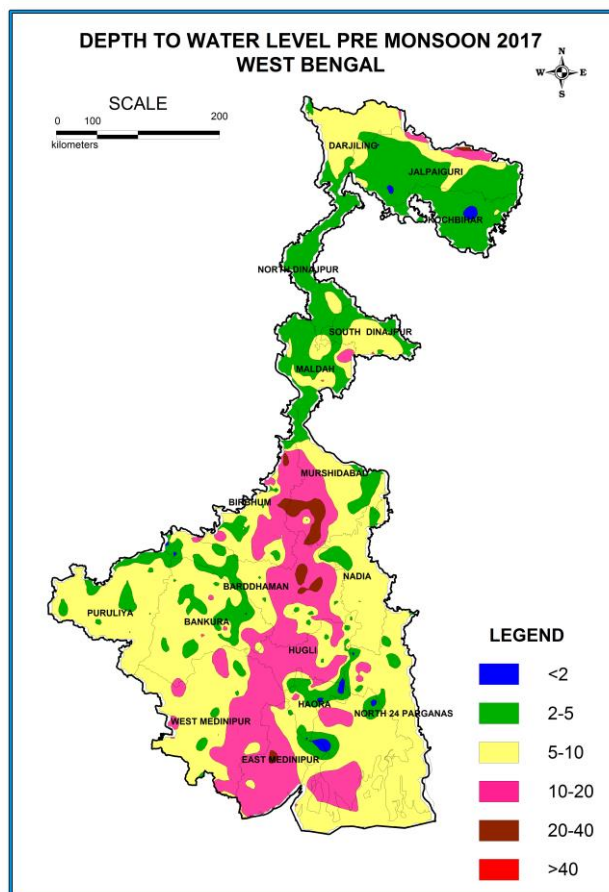
Fluctuation - Premonsoon 2017 to Premonsoon Decadal mean (2007-16)

When compared the decadal mean water level (Premonsoon 2007 to 2016) with water level of Premonsoon 2017, there is predominantly rise in water level in the state. About 53% of the analysed wells have shown rise in water level. Out of this, rise in the range of 0-2 m has been observed at 40% of wells. About 47% of the analysed wells have shown fall in water level, out of which 36% shows fall in the range of 0-2 m. This indicates rise and fall in water level is restricted to 0-2m range.

State-wise Depth to water Level and Distribution of Percentage of Wells for the Period of Premonsoon 2017

State-wise Depth to water Level and Distribution of Percentage of Wells for the Period of Premonsoon, 2017

S. No.	Name of State	No. of wells Analysed	Depth to Water Level (mbgl)		Number & Percentage of Wells Showing Depth to Water Level (mbgl) in the Range of											
			Min	Max	0-2		2-5		5-10		10-20		20-40		> 40	
					No	%	No	%	No	%	No	%	No	%	No	%
1	Andaman & Nicobar Island	81	0.12	9.5	38	47	38	47	5	6.2	0	0.0	0	0	0	0
2	Andhra Pradesh	751	0.00	49.30	46	6.13	278	37.02	305	40.6	115	15.31	4	0.53	3	0.40
3	Arunachal Pradesh	12	1.10	10.82	3	25.00	5	41.67	2	16.67	2	16.67	0	0.00	0	0.00
4	Assam	165	0.02	14.75	22	13.33	99	60.00	42	25.45	2	1.21	0	0.00	0	0.00
5	Bihar	660	0.50	14.73	19	2.88	305	46.21	309	46.82	27	4.09	0	0.00	0	0.00
6	Chandigarh	10	2.75	62.54	0	0.00	2	20.00	3	30.00	2	20.00	2	20.00	1	10.00
7	Chhattisgarh	634	0.78	43.70	12	1.89	122	19.24	349	55.05	126	19.87	22	3.47	3	0.47
8	Dadra & Nagar Haveli	18	2.82	13.18	0	0.00	3	16.67	9	50.00	6	33.33	0	0.00	0	0.00
9	Daman & Diu	12	3.28	11.80	0	0.00	2	16.67	9	75.00	1	8.33	0	0.00	0	0.00
10	Delhi	94	1.13	99.00	2	2.13	17	18.09	21	22.34	24	25.53	17	18.09	13	13.83
11	Goa	65	1.10	16.08	10	15.38	29	44.62	21	32.31	5	7.69	0	0.00	0	0.00
12	Gujarat	802	0.00	60.69	22	2.74	122	15.21	270	33.67	288	35.91	93	11.60	7	0.87

13	**Haryana**	304	0.87	78.43	12	3.95	65	21.38	82	26.97	77	25.33	57	18.75	11	3.62
14	**Himachal Pradesh**	90	0.40	28.59	7	7.78	32	35.56	30	33.33	16	17.78	5	5.56	0	0.00
15	**Jammu & Kashmir**	230	0.36	31.90	20	8.70	122	53.04	57	24.78	21	9.13	10	4.35	0	0.00
16	**Jharkhand**	227	1.35	19.80	2	0.88	22	9.69	159	70.04	44	19.38	0	0.00	0	0.00
17	**Karnataka**	1439	0.34	30.70	66	4.59	273	18.97	620	43.09	454	31.55	26	1.81	0	0.00
18	**Kerala**	1396	0.20	56.20	80	5.73	394	28.22	592	42.41	301	21.56	27	1.93	2	0.14
19	**Madhya Pradesh**	1355	0.85	49.20	6	0.44	164	12.10	667	49.23	452	33.36	65	4.80	1	0.07
20	**Maharashtra**	1663	0.01	60.00	57	3.43	265	15.94	782	47.02	500	30.07	57	3.43	2	0.12
21	**Meghalaya**	21	0.15	5.32	4	19.05	15	71.43	2	9.52	0	0.00	0	0.00	0	0.00
22	**Nagaland**	3	3.04	6.40	0	0.00	2	66.67	1	33.33	0	0.00	0	0.00	0	0.00
23	**Odisha**	1317	0.25	17.42	98	7.44	454	34.47	711	53.99	54	4.10	0	0.00	0	0.00
24	**Pondicherry**	5	2.33	7.70	0	0.00	4	80.00	1	20.00	0	0.00	0	0.00	0	0.00
25	**Punjab**	236	1.31	45.74	8	3.39	34	14.41	63	26.69	67	28.39	61	25.85	3	1.27
26	**Rajasthan**	903	0.19	134.22	15	1.66	108	11.96	216	23.92	224	24.81	166	18.38	174	19.27
27	**Tamil Nadu**	540	0.57	65.75	12	2.22	98	18.15	210	38.89	179	33.15	33	6.11	8	1.48

#	State															
28	Telangana	596	0.63	69.40	10	1.68	106	17.79	251	42.11	174	29.19	44	7.38	11	1.85
29	Tripura	28	1.05	6.37	7	25.00	12	42.86	9	32.14	0	0.00	0	0.00	0	0.00
30	Uttar Pradesh	659	0.73	43.40	13	1.97	178	27.01	299	45.37	144	21.85	24	3.64	1	0.15
31	Uttaranchal	47	0.15	34.40	2	4.26	11	23.40	20	42.55	12	25.53	2	4.26	0	0.00
32	West Bengal	715	0.02	32.75	33	4.62	211	29.51	306	42.80	140	19.58	25	3.50	0	0.00
	Total	**15078**			**626**	**4.15**	**3592**	**23.82**	**6423**	**42.60**	**3457**	**22.93**	**740**	**4.91**	**240**	**1.6**

State-wise Annual Fluctuation & Frequency Distribution of Different Ranges from Premonsoon 2017 to Premonsoon 2016

S. No	Name of State	No. of wells Analysed	Range in m				Rise						Fall						Rise		Fall	
			Rise		Fall		0-2 m		2-4 m		>4 m		0-2 m		2-4 m		>4 m					
			Min	Max	Min	Max	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
1	Andaman & Nicobar	69	0.01	3.93	0.01	6.3	32	46.4	6	8.7	0	0.0	22	31.9	7	10.1	1	1.4	38	55	30	43
2	Andhra Pradesh	744	0.01	19.18	0.01	13.3	168	22.6	25	3.4	24	3.2	315	42.3	94	12.6	59	7.9	217	29	468	63
3	Arunachal Pradesh	12	0.58	1.10	0.05	1.7	7	58.3	0	0.0	0	0.0	5	41.7	0	0.0	0	0.0	7	58	5	42
4	Assam	154	0.01	14.43	0.01	4.8	66	42.9	4	2.6	3	1.9	71	46.1	4	2.6	1	0.6	73	47	76	49
5	Bihar	584	0.01	8.35	0.01	6.0	328	56.2	51	8.7	17	2.9	138	23.6	26	4.5	8	1.4	396	68	172	29
6	Chandigarh	8			0.03	4.4	0	0.0	0	0.0	0	0.0	6	75.0	1	12.5	1	12.5	0	0	8	100
7	Chhattisgarh	505	0.01	14.82	0.02	13.3	197	39.0	49	9.7	34	6.7	136	26.9	30	5.9	27	5.3	280	55	193	38
8	Dadra & Nagar Haveli	15	0.07	8.25	0.20	3.9	4	26.7	1	6.7	3	20.0	3	20.0	4	26.7	0	0.0	8	53	7	47

S. No	Name of State	No. of wells Analysed	Range in m Rise Min	Rise Max	Fall Min	Fall Max	Rise 0-2 m No	%	2-4 m No	%	>4 m No	%	Fall 0-2 m No	%	2-4 m No	%	>4 m No	%	Rise No	%	Fall No	%
9	Daman & Diu	10	0.22	1.51	0.16	2.7	8	80.0	0	0.0	0	0.0	1	10.0	1	10.0	0	0.0	8	80	2	20
10	Delhi	90	0.02	5.77	0.11	8.1	33	36.7	7	7.8	1	1.1	34	37.8	5	5.6	10	11.1	41	46	49	54
11	Goa	60	0.03	9.48	0.03	1.7	35	58.3	8	13.3	4	6.7	13	21.7	0	0.0	0	0.0	47	78	13	22
12	Gujarat	739	0.01	16.60	0.01	14.96	230	31.1	53	7.2	65	8.8	198	26.8	68	9.2	42	5.7	348	47	308	42
13	Haryana	278	0.02	5.89	0.02	7.5	94	33.8	3	1.1	1	0.4	146	52.5	21	7.6	10	3.6	98	35	177	64
14	Himachal Pradesh	87	0.01	6.09	0.03	3.8	28	32.2	4	4.6	2	2.3	47	54.0	5	5.7	0	0.0	34	39	52	60
15	Jammu & Kashmir	221	0.02	5.25	0.01	7.9	90	40.7	16	7.2	3	1.4	89	40.3	14	6.3	4	1.8	109	49	107	48
16	Jharkhand	176	0.02	5.61	0.03	8.1	74	42.0	9	5.1	3	1.7	66	37.5	12	6.8	7	4.0	86	49	85	48
17	Karnataka	1368	0.02	15.50	0.01	16.9	314	23.0	84	6.1	72	5.3	491	35.9	131	9.6	113	8.3	470	34	735	54
18	Kerala	1297	0.01	13.50	0.01	16.2	490	37.8	27	2.1	12	0.9	658	50.7	64	4.9	29	2.2	529	41	751	58
19	Madhya Pradesh	1301	0.01	17.13	0.01	16.4	598	46.0	106	8.1	76	5.8	403	31.0	49	3.8	47	3.6	780	60	499	38

S. No	Name of State	No. of wells Analysed	Range in m				Rise						Fall						Rise		Fall	
			Rise		Fall		0-2 m		2-4 m		>4 m		0-2 m		2-4 m		>4 m					
			Min	Max	Min	Max	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
20	Maharashtra	1489	0.01	14.40	0.01	16.5	517	34.7	172	11.6	129	8.7	420	28.2	102	6.9	59	4.0	818	55	581	39
21	Meghalaya	14	0.04	0.33	0.01	1.8	2	14.3	0	0.0	0	0.0	12	85.7	0	0.0	0	0.0	2	14	12	86
22	Nagaland	3	1.94	5.07	0.53	0.5	1	33.3	0	0.0	1	33.3	1	33.3	0	0.0	0	0.0	2	67	1	33
23	Odisha	1158	0.01	7.55	0.01	10.5	518	44.7	25	2.2	6	0.5	535	46.2	30	2.6	16	1.4	549	47	581	50
24	Pondicherry	4			0.21	5.5	0	0.0	0	0.0	0	0.0	3	75.0	0	0.0	1	25.0	0	0	4	100
25	Punjab	228	0.02	7.17	0.02	18.4	33	14.5	7	3.1	2	0.9	149	65.4	22	9.6	15	6.6	42	18	186	82
26	Rajasthan	770	0.01	14.42	0.01	18.2	230	29.9	79	10.3	83	10.8	268	34.8	43	5.6	60	7.8	392	51	371	48
27	Tamil Nadu	435	0.01	11.25	0.02	17.0	28	6.4	9	2.1	6	1.4	134	30.8	113	26.0	143	32.9	43	10	390	90
28	Telangana	556	0.02	16.88	0.02	11.3	175	31.5	96	17.3	116	20.9	82	14.7	17	3.1	23	4.1	387	70	122	22
29	Tripura	22	0.02	2.33	0.05	3.3	9	40.9	1	4.5	0	0.0	9	40.9	2	9.1	0	0.0	10	45	11	50
30	Uttar Pradesh	533	0.01	7.10	0.03	8.1	260	48.8	33	6.2	8	1.5	212	39.8	16	3.0	3	0.6	301	56	231	43
31	Uttaranchal	38	0.13	4.29	0.18	3.7	13	34.2	3	7.9	2	5.3	14	36.8	5	13.2	0	0.0	18	47	19	50

S. No	Name of State	No. of wells Analysed	Range in m				Rise						Fall						Rise		Fall	
			Rise		Fall		0-2 m		2-4 m		>4 m		0-2 m		2-4 m		>4 m					
			Min	Max	Min	Max	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
32	West Bengal	455	0.01	17.68	0.01	16.0	206	45.3	51	11.2	33	7.3	139	30.5	16	3.5	6	1.3	290	64	161	35
	Total	**13423**					**4788**	**36**	**929**	**6.9**	**706**	**5.3**	**4820**	**35.9**	**902**	**6.7**	**685**	**5.1**	**6423**	**48**	**6407**	**48**

State-wise Fluctuation & Frequency Distribution of Different Ranges from Premonsoon 2017 to Decadal Mean [Premonsoon(2007 to 2016)]

S.No.	Name of State	No. of wells Analysed	Range in m				Rise						Fall						Total			
			Rise		Fall		0-2 m		2-4 m		>4 m		0-2 m		2-4 m		>4 m		Rise		Fall	
			Min	Max	Min	Max	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
1	Andhra Pradesh	751	0.01	11.25	0.02	10.79	153	20.4	19	2.5	12	1.6	399	53.1	104	13.8	60	8.0	751	0.01	11.25	0.02
2	Arunachal Pradesh	12	0.32	11.28	0.68	1.2	7	58.3	1	8.3	1	8.3	3	25.0	0	0.0	0	0.0	12	0.32	11.28	0.68
3	Assam	164	0.02	7.64	0.02	5.2	63	38.4	6	3.7	2	1.2	84	51.2	7	4.3	1	0.6	164	0.02	7.64	0.02
4	Bihar	625	0.01	5.25	0.01	6.32	315	50.4	38	6.1	9	1.4	218	34.9	36	5.8	4	0.6	625	0.01	5.25	0.01
5	Chandigarh	10	0.16	0.16	0.26	23.05	1	10.0	0	0.0	0	0.0	6	60.0	2	20.0	1	10.0	10	0.16	0.16	0.26
6	Chhattisgarh	566	0.01	18.68	0.01	18.4	153	27.0	41	7.2	25	4.4	252	44.5	55	9.7	39	6.9	566	0.01	18.68	0.01
7	Dadra & Nagar Haveli	16	0.27	8.25	0.02	4.62	3	18.8	1	6.3	2	12.5	7	43.8	2	12.5	1	6.3	16	0.27	8.25	0.02
8	Daman & Diu	11	0.01	1.48	0.19	4.64	7	63.6	0	0.0	0	0.0	2	18.2	1	9.1	1	9.1	11	0.01	1.48	0.19

#	State																					
9	Delhi	94	0.05	8	0	8.81	23	24.5	7	7.4	3	3.2	27	28.7	16	17.0	18	19.1	94	0.05	8	0
10	Goa	65	0	9.05	0.03	1.56	33	50.8	14	21.5	3	4.6	15	23.1	0	0.0	0	0.0	65	0	9.05	0.03
11	Gujarat	799	0	16.72	0.01	18.31	220	27.5	61	7.6	20	2.5	282	35.3	98	12.3	93	11.6	799	0	16.72	0.01
12	Haryana	302	0.01	5.52	0.01	13.14	85	28.1	6	2.0	4	1.3	113	37.4	50	16.6	44	14.6	302	0.01	5.52	0.01
13	Himachal Pradesh	90	0.01	8.85	0.02	5.02	27	30.0	3	3.3	3	3.3	44	48.9	11	12.2	2	2.2	90	0.01	8.85	0.02
14	Jammu & Kashmir	226	0.01	6.37	0	7.52	67	29.6	4	1.8	4	1.8	131	58.0	16	7.1	4	1.8	226	0.01	6.37	0
15	Jharkhand	218	0.02	5.26	0.01	6.71	72	33.0	16	7.3	2	0.9	103	47.2	18	8.3	7	3.2	218	0.02	5.26	0.01
16	Karnataka	1421	0.01	12.62	0.0	16.87	315	22.2	66	4.6	42	3.0	605	42.6	220	15.5	160	11.3	1421	0.01	12.62	0.0
17	Kerala	1366	0.0	7.8	0.0	9.41	374	27.4	26	1.9	5	0.4	838	61.3	95	7.0	24	1.8	1366	0.0	7.8	0.0
18	Madhya Pradesh	1318	0.01	13.01	0.01	18.06	485	36.8	116	8.8	59	4.5	509	38.6	93	7.1	56	4.2	1318	0.01	13.01	0.01
19	Maharashtra	1562	0.0	13.94	0.0	14.85	474	30.3	119	7.6	74	4.7	604	38.7	191	12.2	92	5.9	1562	0.0	13.94	0.0
20	Meghalaya	20	0.24	2.07	0.06	1.8	5	25.0	1	5.0	0	0.0	14	70.0	0	0.0	0	0.0	20	0.24	2.07	0.06
21	Odhisha	1283	0.01	7.8	0.01	10.77	460	35.9	43	3.4	3	0.2	683	53.2	77	6.0	13	1.0	1283	0.01	7.8	0.01
22	Pondicherry	5			0.07	4.34	0	0.0	0	0.0	0	0.0	4	80.0	0	0.0	1	20.0	5			0.07
23	Punjab	234	0.0	6.53	0.01	17.32	33	14.1	2	0.9	1	0.4	115	49.1	42	17.9	41	17.5	234	0.0	6.53	0.01

24	Rajasthan	859	0.0	17.42	0.01	17.6	236	27.5	100	11.6	95	11.1	226	26.3	72	8.4	130	15.1	859	0.0	17.42	0.01
25	Tamil Nadu	536	0.0	15.77	0.03	16.71	47	8.8	10	1.9	14	2.6	187	34.9	127	23.7	151	28.2	536	0.0	15.77	0.03
26	Telangana	586	0.01	16.88	0	19.3	202	34.5	74	12.6	39	6.7	175	29.9	48	8.2	44	7.5	586	0.01	16.88	0
27	Tripura	26	0.05	2.71	0.09	3.49	16	61.5	2	7.7	0	0.0	6	23.1	2	7.7	0	0.0	26	0.05	2.71	0.09
28	Uttar Pradesh	637	0.01	7.54	0	11.03	158	24.8	20	3.1	9	1.4	365	57.3	65	10.2	20	3.1	637	0.01	7.54	0
29	Uttarakhand	46	0.02	7.8	0.01	7.77	13	28.3	6	13.0	2	4.3	16	34.8	7	15.2	1	2.2	46	0.02	7.8	0.01
30	West Bengal	617	0.01	13.53	0.01	17	247	40.0	45	7.3	35	5.7	221	35.8	46	7.5	22	3.6	617	0.01	13.53	0.01
Total		14465					4294	29.7	847	5.9	468	3.2	6254	43.2	1501	10.4	1030	7.1	5609	39	8785	61

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