Groundwater

Indicators (units)

1. Depth to groundwater level (m bgl)
2. Decadal mean water level fluctuation pre-monsoon (percent rise)
3. Decadal mean water level fluctuation pre-monsoon (percent fall)
4. Decadal fluctuation - percent wells recording fall of 0-2 m
5. Decadal fluctuation - percent wells recording fall of 2-4 m
6. Decadal fluctuation - percent wells recording fall of >4 m
7. Decadal fluctuation - percent wells recording rise of 0-2 m
8. Decadal fluctuation - percent wells recording rise of 2-4 m
9. Decadal fluctuation - percent wells recording rise of >4 m
10. Number of wells analyzed per district

Data Sources

India-WRIS (Water Resources Information System)

India-WRIS was initiated by a Memorandum of Understanding signed on December 3rd, 2008 between the Ministry of Jal Shakti and the Indian Space Research Organization (ISRO), Department of Space. It is managed by the National Water Informatics Centre (NWIC).

Institution Who Collected Primary Data

Central Ground Water Board (CGWB)
Department of Water Resources
Ministry of Water Resources, River Development & Ganga Rejuvenation (now Ministry of Jal Shakti)

Jointly with State Groundwater Departments: http://cgwb.gov.in/StateGW-Departments.html

Years Data Have Been Collected

1969 to 2023

Data are reported as seasonal fluctuations, annual fluctuations, and decadal fluctuations. For decadal fluctuations, means are only derived if water level data are available for at least 6 of the selected 10 years. Only decadal fluctuations are included in the Poshan Atlas.

Years Data Are Available

Groundwater level:
1993 to 2023, through India-WRIS

Decadal fluctuations:
2003 to 2020, through India-WRIS

Years Data Are Compiled For

Groundwater level:
1993 to 2021

Decadal fluctuations:
2003 (as compared to mean pre-monsoon water level for 1993 to 2002) to 2019 (as compared to mean pre-monsoon water level for 2009 to 2018)

Population Subgroups Available

None

Methods of Data Collection

Groundwater levels are monitored four times a year through a network of 23,196 monitoring wells (Figure). Wells are found in all states except Mizoram & Sikkim and the Union Territory of Lakshadweep. The four time points each year include: January, pre-monsoon (March/April/May), August, and post-monsoon. Only pre-monsoon values are included in the Poshan Atlas because these are the standard for scenario reports published by CGWB.
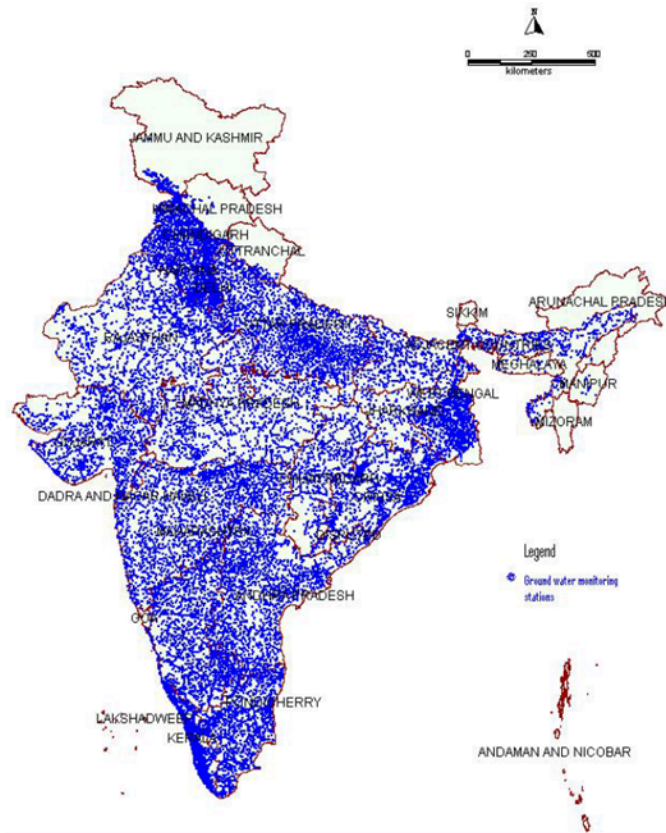
Figure. Location of groundwater monitoring stations. From "Ground Water Scenario in India, Pre-monsoon 2018" published by CGWB.

Example of Interpreting Data

The groundwater level data for pre-monsoon 2019 indicated a maximum depth to water level of 75.71 m bgl in Gandhinagar district of Gujarat and minimum of 0.9 m bgl in North and Middle Andaman district of Andaman and Nicobar Islands.

A comparison of depth to water level of pre-monsoon 2019 with the decadal mean of pre-monsoon (2009-2018) indicates that of 22 wells analyzed in North West Delhi, 45% are showing a rise in water level and 54% are showing a decline in water level. In terms of the amount of rise, 41% are showing an increase of 0-2 m and 5% an increase of 2-4 m. In terms of the amount of decline, 18% are showing a decline of 0-2 m, 27% a decline of 2-4 m, and 9% a decline of >4 m.

References and Further Reading

Source of data (must first register for a free account):
https://indiawris.gov.in/wris/#/DataDownload

Groundwater scenario reports: http://cgwb.gov.in/GW-Scenario.html

In addition to groundwater level, regular in-depth assessments of recharge from rainfall and other sources (monsoon and non-monsoon season), total natural discharge, extraction for irrigation, industrial use, and domestic use, and the ultimate state of groundwater extraction are available. These in-depth assessments were conducted in 1995, 2004, 2009, 2011, 2013, and 2017. The 1995 assessment used the Ground Water Estimation Committee (GEC) - 1984 methodology. The 2004, 2009, 2011, and 2013 assessments used the GEC - 1997 methodology. The 2017 assessment used the GEC - 2015 methodology. A total of 6,881 units were assessed in 2017.