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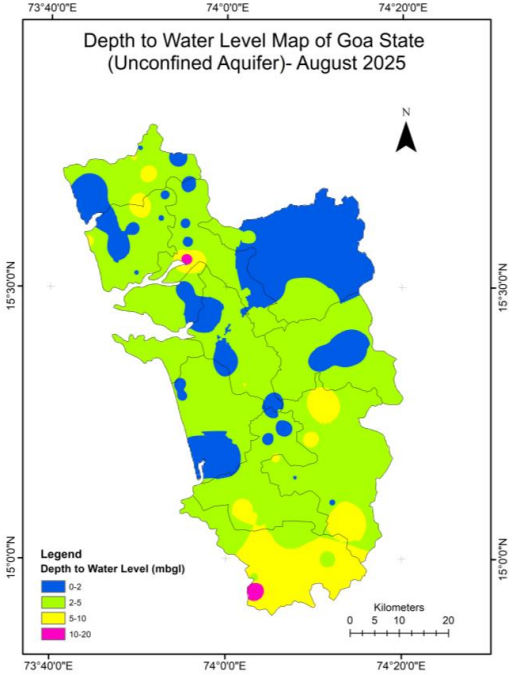
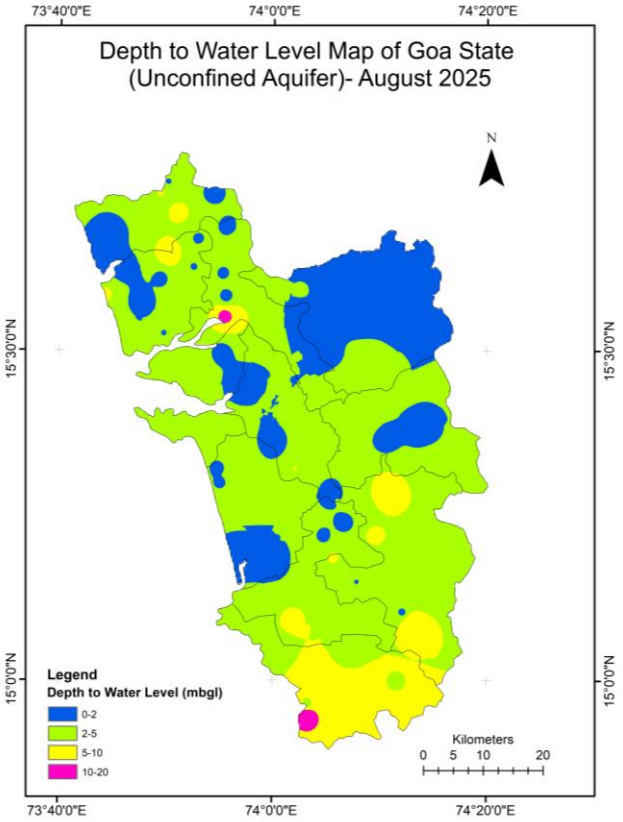
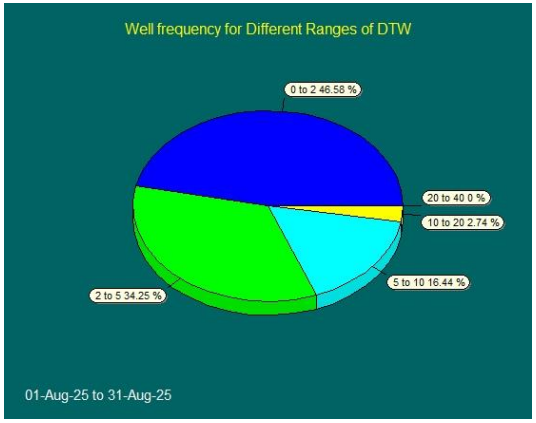
# GROUND WATER LEVEL BULLETIN
# AUGUST 2025 - GOA STATE

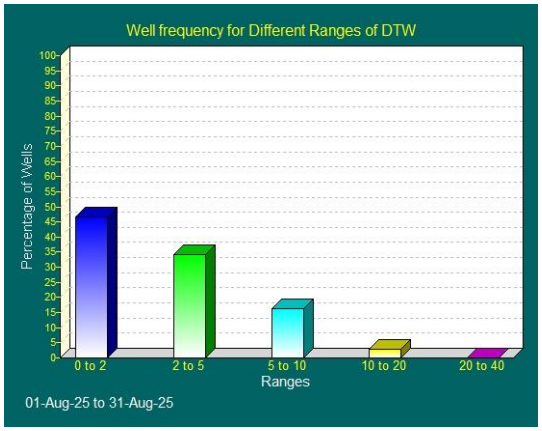



**Central Ground Water Board**
**South Western Region**
**Bengaluru**

**October 2025**




# GROUND WATER LEVEL BULLETIN AUGUST 2025 - GOA STATE

## ABSTRACT

This report presents the groundwater level scenario for the state of Goa during the period of August 2025. The analysis is based on data collected from a network of 73 dug wells representing unconfined aquifer spread across entire State encompassing North and South Goa districts. The depth to water level in the unconfined aquifer during August 2025 ranged from minimum of GL (ground level) at Panchwadi, Salcete taluk, South Goa district to a maximum of 14.91 mbgl at Daptamol, Canacona taluk, South Goa district. It predominantly ranged from 2 to 10 m bgl in 97% of wells analysed.

Entire Goa state (100% of wells) shows a rise in water level when Aug 2025 water levels are compared with Aug 2024, Whereas, comparison of Aug 2023 with Aug 2025 indicates a rise in water levels 87% of wells, whereas fall is observed in 13% of the wells analysed. Similarly, a comparison with the decadal mean water level (2015-2024) indicates rise in almost 90% of the wells, suggesting a positive trend in groundwater recharge in recent years.

The report also provides recommendations for sustainable groundwater management, including rainwater harvesting, and promoting water conservation practices to address localized areas of water level decline and ensure long-term water security.

**Central Ground Water Board,**
**South Western Region, Bangalore**

# GROUND WATER LEVEL BULLETIN AUGUST 2025 - GOA STATE



**Maps & Tables list:**

# 1 INTRODUCTION:

The groundwater bulletin is a periodical publication by the Central Ground Water Board (CGWB) that depicts the changing groundwater regime of the Goa State across different seasons. It is an effort to obtain critical information on groundwater levels through a network of representative monitoring wells. The groundwater regime is influenced by natural climatic parameters like rainfall and evapotranspiration, as well as anthropogenic factors such as groundwater extraction for various uses, recharge from irrigation systems, and water conservation practices.

The CGWB has been monitoring groundwater levels since 1970. Measurements are taken four times a year: January, May (Pre-Monsoon), August, and November (Post-Monsoon). As on March 2025, the National Hydrograph Network Stations (NHNS) in Goa consists of 135 observation wells stations (81 dug wells (DW) and 54 piezometers (PZ)), which are monitored to assess the state's groundwater regime. However, the present August 2025 bulletin has been prepared for unconfined aquifer (shallow aquifer) by utilising data of 73 monitored dug wells.

# 2 STUDY AREA

Goa, with a total geographical area of 3,702 sq. km, is administratively divided into two districts (North Goa and South Goa) and 12 taluks. In recent years, groundwater has become a vital resource to meet the increasing water demands of the state's tourism, domestic, and industrial sectors.

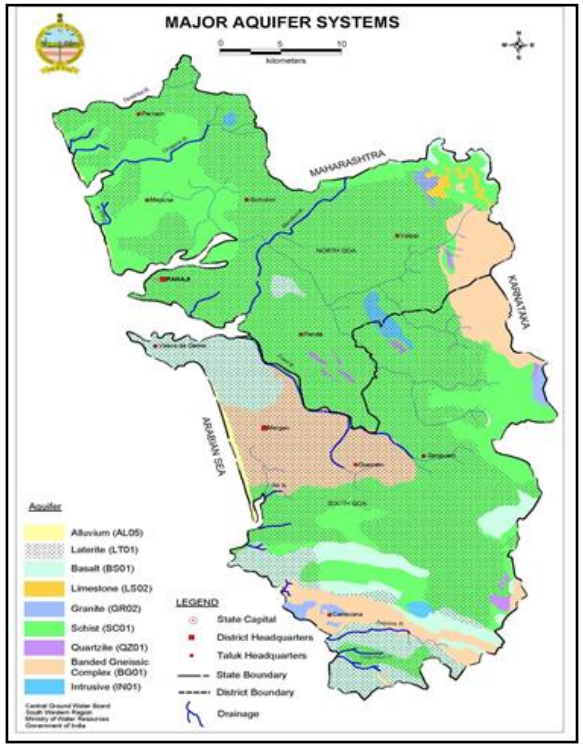



**Figure 1: Map showing major aquifers and administrative divisions of the state/study area**

Goa state is dominantly covered by the formations of the Goa group belonging to Dharwad Super Group of Archaean to Proterozoic age, except for a narrow strip along the north eastern corner occupied by Deccan Trap of Upper Cretaceous to Lower Eocene age. The Goa group is consisting of green schist facies of the metamorphic rocks and is divided in to Barcem, Sanvordem, Bicholim and Vageri formations in the ascending order of super position. The Goa groups of rocks have been intruded by granite gneiss, feldspathic gneiss, hornblende gneiss and porphyritic granite, followed by basic intrusive. During The Sub-Recent and Recent times the rocks have been subjected to lateritisation of varying thickness. Coastal alluvium occurring along the coastal planes consists of fine to coarse sands with intercalations of sandy loam, silt and clay. Ground water bearing formations in Goa state are alluvium, laterite, granite and granite gneiss, meta-volcanics and sedimentaries. The major aquifer system of Goa State are depicted in Figure-1.

## 3 GROUND WATER LEVEL MONITORING

The Central Ground Water Board, South Western Region, continuously monitors the groundwater regime in Goa on a quarterly basis. The established network comprises 135 monitoring stations (81 dug wells (DW) and 54 piezometers (PZ)) located in diverse hydrogeological units.

During August 2025, groundwater levels were monitored in 113 of these stations. The monitored network included 73 dug wells and 40 piezometers. The remaining stations were not monitored due to being inaccessible, closed or having gone dry. The district-wise breakup of the water level monitoring stations is given in Table-1.

**Table-1: District wise distribution of dug wells monitored in August 2025**

| S. No. | District | Dug Wells Monitored |
|---|---|---|
| 1. | North Goa | 37 |
| 2. | South Goa | 36 |

## 4 RAINFALL AND CLIMATE

The state has a tropical-maritime monsoonal type climate with distinct aerographic influence. Due to proximity to the Arabian Sea humidity throughout the year is more than 60% and it ranges from 80 to 90% during monsoon period. Rain occurs during the South West monsoon period from June to September (almost 90% of annual rainfall). As a result of orographic influence rainfall increases

towards the Western Ghats from the coast. The normal annual rainfall for entire Goa State is 3367.86 mm.

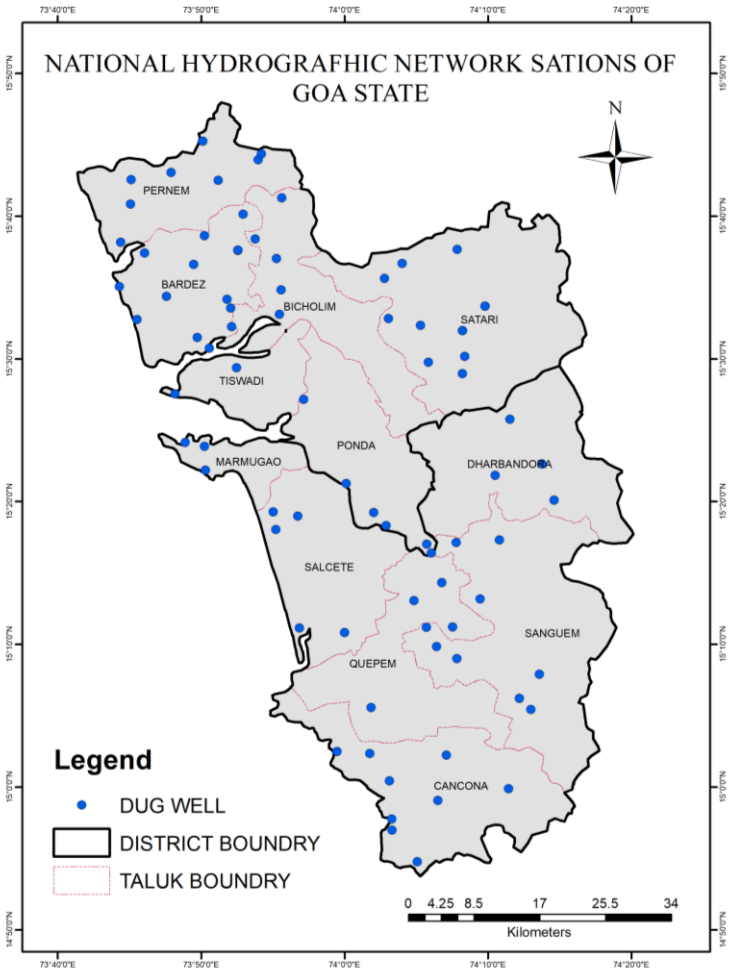



**Figure. 2 Map showing locations of monitoring wells (NHNS) in the Goa State**

# 5 GROUND WATER LEVEL SCENARIO OF UNCONFINED AQUIFER

## 5.1 DEPTH TO WATER LEVEL SCENARIO OF UNCONFINED AQUIFER DURING AUGUST 2025.

The percentage-based distribution is presented graphically in Figure 3 and the depth to water level scenario is spatially plotted in Figure 4. It indicates that major part of the State is having water levels in the range of 2 to 5 m bgl, the north-eastern part is showing shallow water levels of less than 2m, whereas southern parts are showing moderate water levels in the range of 5 to 10 m bgl. The analysis of the water level data from 73 monitored dug wells reveals the following salient features for Aug 2025:

- The depth to water level ranged from a minimum of **GL (ground level)** at Panchwadi, Salcete taluk, South Goa district to a maximum of **14.91 mbgl** at Daptamol, Canacona taluk, South Goa district.
- The depth to water level over major part of the State lies within 10 m bgl i.e. **97.26%** of wells analysed, while **2.74%** of wells show depth to water level in the 10-20 m bgl range.
- Depth to water level of less than 2 m bgl has been recorded in **46.58%** of wells analysed and noted in all taluks except Canacona & Mormugao taluk.

- Depth to water level in the range of 2 to 5 m bgl has been recorded in 34.25% of wells analyzed and noted in all the taluks.
- Depth to water level in the range of 5 to 10 m bgl in 16.44% of wells and noted in Bardez, Pernem, Canacona, Ponda, Quepem & Sanguem taluks
- Depth to water level in the range of 10 to 20 m bgl has been observed in only **2.74%** of wells analysed and noted in Bicholim and Canacona taluks.

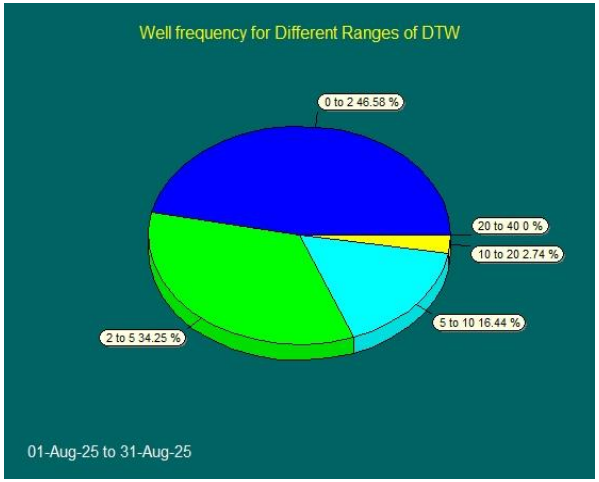



**Figure 3: Percentage of wells in different water level ranges in an unconfined aquifer.**

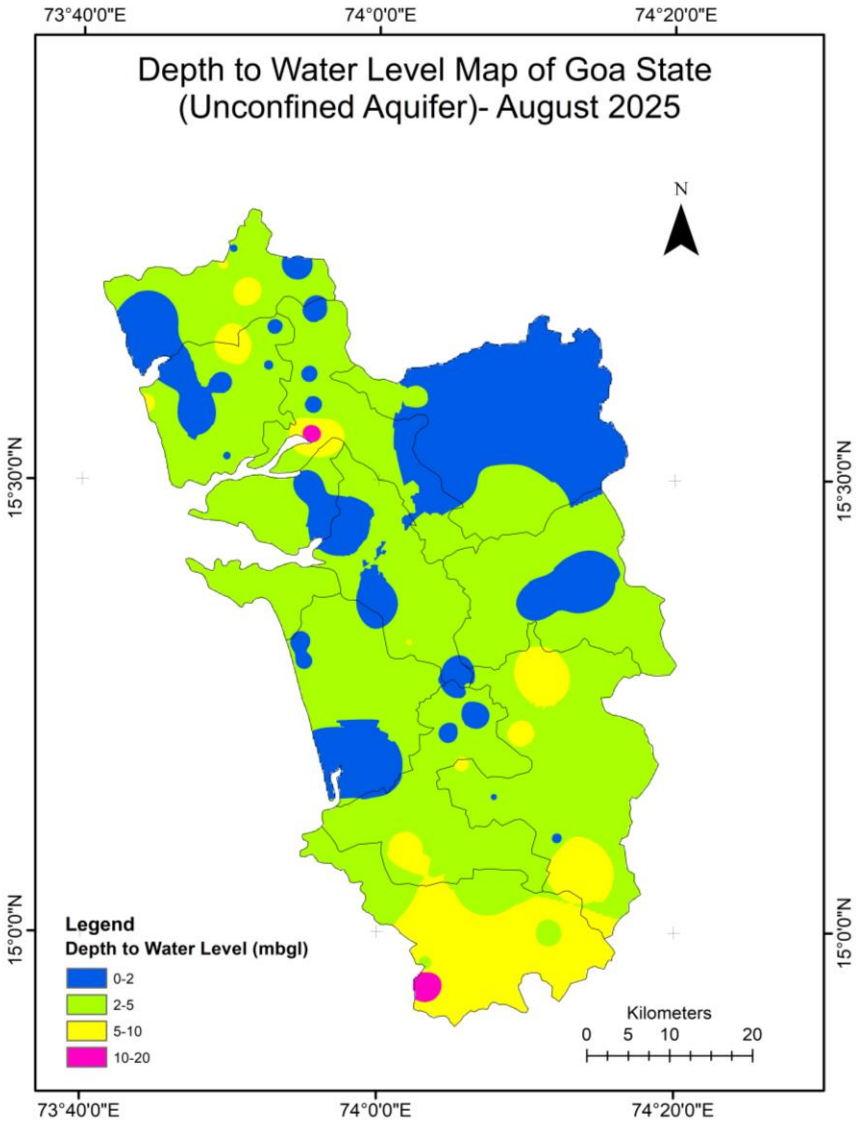



**Figure 4: Depth to water level of unconfined aquifer during August 2025**

## 5.2 ANNUAL FLUCTUATION OF WATER LEVEL IN UNCONFINED AQUIFER

### 5.2.1 Annual Fluctuation of Water Level in Unconfined Aquifer (Aug 2024 to Aug 2025)

A comparison of water levels between Aug 2024 and Aug 2025 shows a rise in 100% of analyzed wells and this percentage-based distribution is presented graphically in Figure 5. The corresponding annual fluctuation in the shallow aquifer's water level is spatially plotted in Figure 6. It indicates that major part of the State is having fluctuations in the range of 2 to 4 m, the north eastern part being the hilly area is showing higher fluctuation of more than 4 m, whereas western parts are showing fluctuations in the range of 0 to 2 and 2 to 4 m.

- Rise in the water level in the range of 0-2 m has been observed in **38.24%** of wells analysed and observed in all the taluks.
- Rise in the water level in the range of 2-4 m has been observed in **32.35%** of wells analysed in all the taluks except Marmugao, Quepem and Tiswadi taluks.
- Rise in the water level in the range of >4 m has been observed in **29.41%** of wells analysed and observed in all the taluks except Marmugao, and Ponda taluks.

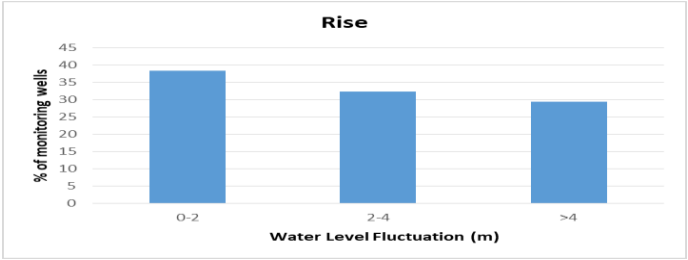



**Figure 5: Percentage of wells showing rise in WL in an unconfined aquifer. (Aug 2024 to Aug 2025)**

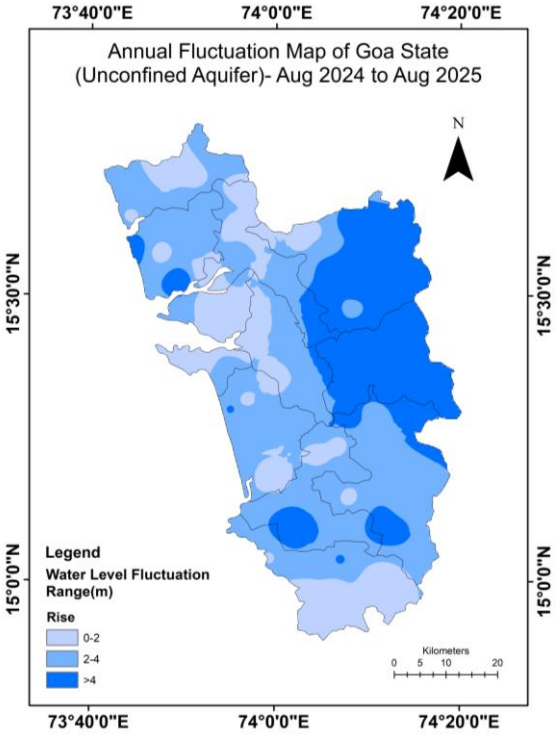



**Figure 6: Annual water level fluctuation in unconfined aquifer (Aug 2024 to Aug 2025)**

### 5.2.2 Annual Fluctuation of Water Level in Unconfined Aquifer (Aug 2023 to Aug 2025)

A comparison of water levels between Aug 2023 and Aug 2025 shows a rise in 89.86% of analyzed wells and this percentage-based distribution is presented graphically in Figure 7. The corresponding annual fluctuation in the shallow aquifer's water level is spatially plotted in Figure 8. It indicates that major part of the State is having fluctuations in the range of 0 to 2 m, followed by 2-4 m range observed in small patches in central, eastern and northern parts. Fall in water levels of 0 to 2 m range is observed mainly in southern part of the State.

- Rise in the water level in the range of 0-2 m has been observed in **59.42%** of wells analysed and observed in all the taluks.
- Rise in the water level in the range of 2-4 m has been observed in **24.64%** of wells analysed in all the taluks except Marmugao & Salcete taluks.
- Rise in the water level in the range of >4 m has been observed in **5.80%** of wells analysed and observed in Bicholim, Pernem, Quepem, Salcete taluks.
- Fall in the water level in the range of 0-2 m has been observed in 1.45 % of wells analysed and observed in Sanguem taluk
- Fall in the water level in the range of >4 m has been observed in 5.8 % of wells analysed and observed in Canacona, Sangeum & Tiswadi taluks.

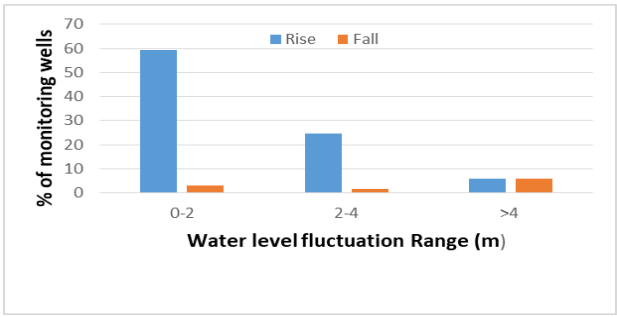



**Figure 7: Percentage of wells showing rise in WL in an unconfined aquifer. (Aug 2023 to Aug 2025)**

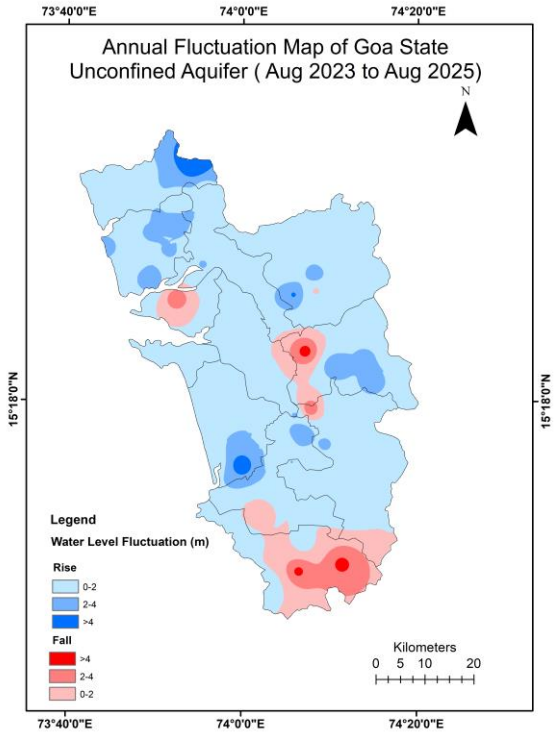



**Figure 8: Annual water level fluctuation in unconfined aquifer (Aug 2023 to Aug 2025)**

## 5.3 SEASONAL FLUCTUATION OF WATER LEVEL IN UNCONFINED AQUIFER (MAY 2025 TO AUGUST 2025)

A comparison of water level between May 2025 and Aug 2025 shows that a rise in the water level is recorded in **92.19%** of wells analyzed and fall of water level recorded in **7.81%** of wells analysed. This percentage-based distribution is presented graphically in Figure 7. The corresponding annual fluctuation in the shallow aquifer's water level is spatially plotted in Figure 8. It indicates that major part of the State is showing rise in the range of 0 to 2 m followed by 2 to 4 m, the north eastern part being the hilly area is showing higher fluctuation of more than 4 m, whereas western parts are showing fluctuations mainly in the range of 0 to 2. Negative fluctuation (fall) is observed in small areas scattered in north, central and south parts of the State.

- Rise in the water level in the range of 0-2 m has been observed in 48.44% of wells analysed and observed in all the taluks. Rise in the water level in the range of 2-4 m has been observed in 17.19% of wells in Bicholim, Canacona, Pernem, Quepem, Salcete & Sangeum taluks. Rise in the water level in the range of >4 m has been observed in 26.56% of wells in all the taluks except Marmugoa, Pernem, Ponda & Quepem taluk.
- Fall in the water level in the range of 0-2 m has been observed in 4.69% of wells analysed and observed in Bicholim, Canacona & Quepem taluks. Fall in the water level in the range of 2-4 m has been observed in 1.56% of wells in Ponda taluk. Fall >4 m has been observed in 1.56% of wells analysed and observed in Bardez taluk.

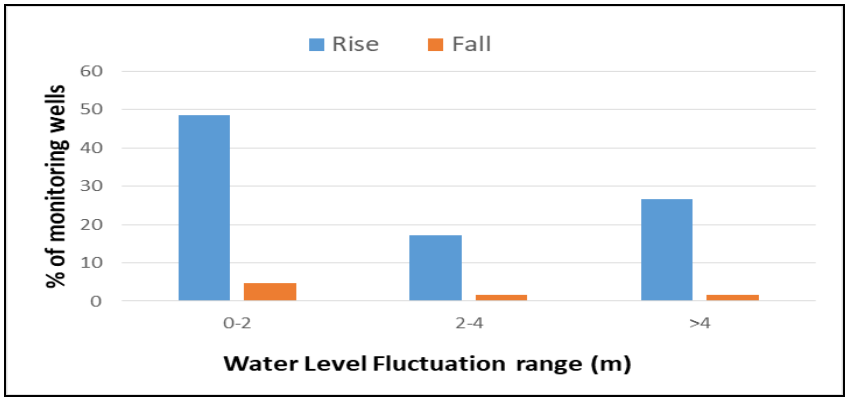



**Figure 9: Percentage of wells showing rise and fall in WL in an unconfined aquifer. (May 2025 to Aug 2025)**

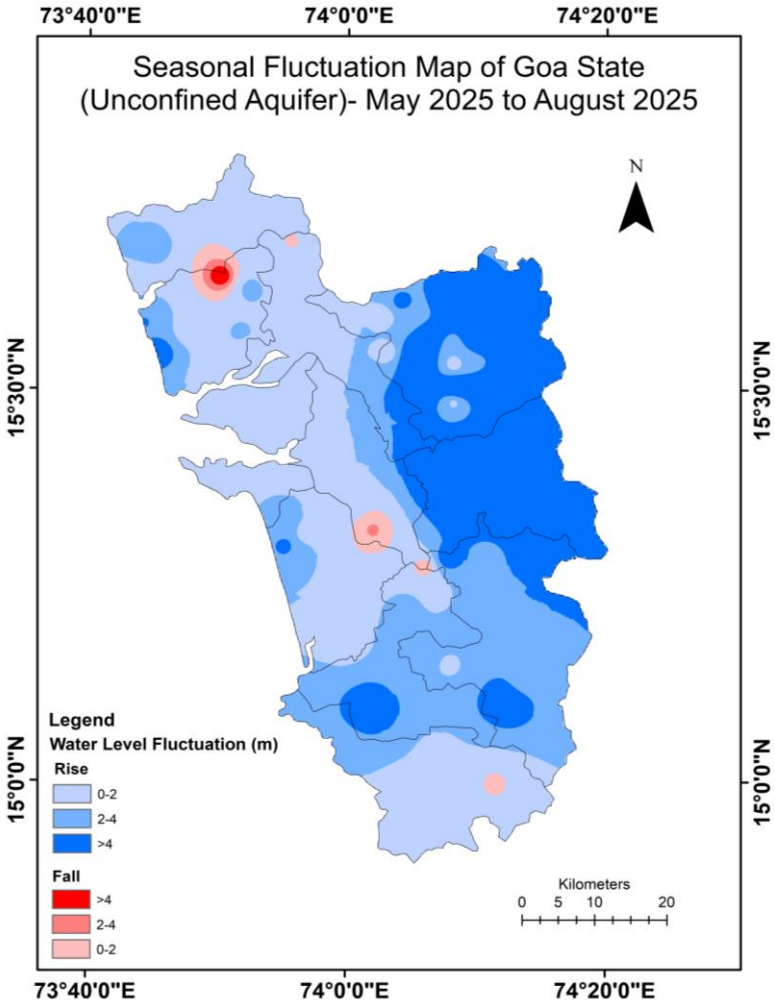



**Figure 10: Seasonal water level fluctuation in unconfined aquifer (May 2025 to Aug 2025)**

## 5.4 DECADAL FLUCTUATION IN WATER LEVEL (DECADAL MEAN AUG (2015-2024) TO AUG 2025)

A comparison of August 2025 water levels with the decadal average (August 2015-2024) shows that a rise in the water level is recorded in **89.86%** of wells analysed and fall of water level recorded in **10.14%** of wells analyzed. This percentage-based distribution is presented graphically in Figure 9. The corresponding decadal fluctuation in the shallow aquifer's water level is spatially plotted in Figure 10. It indicates that the entire State is showing rise in water levels in the range of 0 to 2 m. Whereas fall in water levels of 0 to 2 m is observed in small areas mainly concentrated in southern part of the State.

- Rise in the water level in the range of 0-2 m has been observed in 79.71% of wells in all the taluks.
- Rise in the water level in the range of 2-4 m has been observed in 10.14% of wells in Bardez, Bicholim, Pernem, Sangeum and Sattari taluks.
- Fall in the water level in the range of 0-2 m has been observed in 8.70% of wells in Bardez, Canacona, Pernem, Sangeum, Tiswadi taluks. Fall in the water level in the range of 2-4 m has been observed in only 1.45% of wells in Cancona taluk.

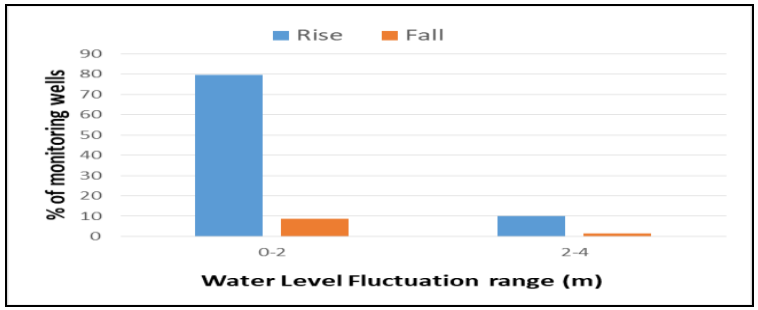



**Figure 11: Percentage of wells showing rise and fall in WL in unconfined Aquifer (Decadal Mean Aug (2015-2024) to Aug 2025)**

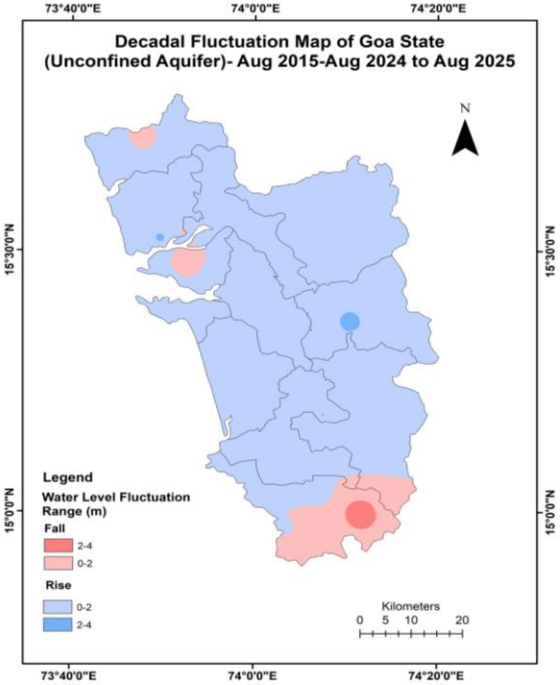



**Figure 12: Decadal water level fluctuation in unconfined Aquifer (Decadal Mean Aug (2015-2024) to Aug 2025)**

# 6 SUMMARY

The Ground Water Level Bulletin of Goa State for August 2025 presents an overview of groundwater conditions based on observations from 73 dug wells. The depth to water level during August 2025 ranged from minimum of GL (ground level) at Panchwadi, Salcete taluk, South Goa district to a maximum of 14.91 mbgl at Daptamol, Canacona taluk, South Goa district. About 97% of wells recorded water levels within 10 m bgl, with nearly half showing levels less than 2 m bgl.

A year-on-year comparison (Aug 2024–Aug 2025) indicates a rise in water levels across all wells monitored: 38% showed a 0–2 m rise, 32% a 2–4 m rise, and 29% recorded more than 4 m rise. Whereas, comparison of Aug 2023 with Aug 2025 indicates a rise in water levels 87% of wells, whereas fall is observed in 13% of the wells analysed.

Seasonal comparison (May–Aug 2025) shows 92% of wells with rising water levels, reflecting strong recharge due to south west monsoon season. Decadal analysis (2015–2024 to Aug 2025) highlights a long-term positive trend, with nearly 90% of wells showing water level improvement, indicating sustainable recharge conditions.

# 7 RECOMMENDATIONS

In order to enhance the groundwater scenario of Goa state utmost effort should be made to harvest the rainwater received during monsoon days and use it for artificial recharge. The following recommendations are suggested:

- Abandoned bore wells/dug well / Mine pits can be used to recharge the aquifer by utilizing the surplus surface runoff available during rainy days.
- Master plan for artificial recharge of Goa as well as NAQUIM reports of CGWB should be consulted/referred in selecting sites for artificial recharge structures.
- Periodic maintenance of the recharge structures is also recommended to maintain the efficiency of the structure.
- Spring-shed development should be taken up for developing the springs, which offer a sustainable source of domestic water supply in foot hill zones as indicated by NAQUIM 2.0 studies in Cancona taluk
- Point recharge structures are recommended to recharge deeper aquifers
- Efficient micro irrigation practices should be adopted especially in water intensive crops.
- Ground water regulation measures need to be implemented more stringently by the State Govt.
- Use of Grey water after treatment, opting for water efficient fixtures and low flow plumbing fixtures reduce the stress on groundwater. Low flow technology is normally used in faucets, aerator, shower heads and toilets.