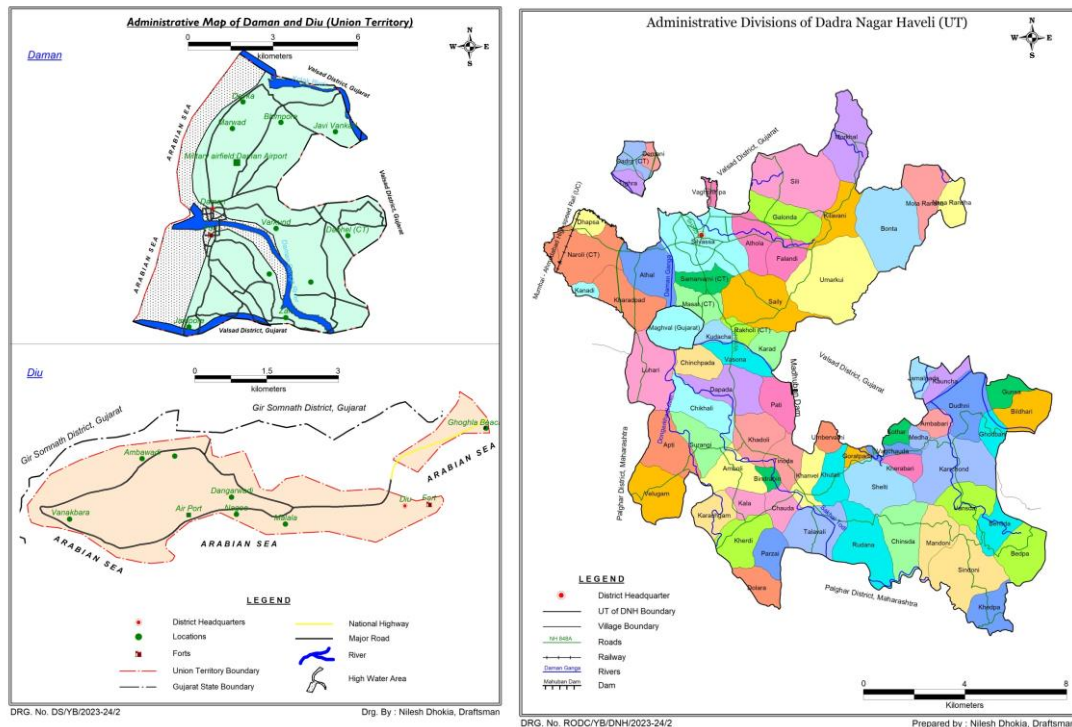


# GROUND WATER LEVEL BULLETIN

November 2024

UT OF DAMAN, DIU AND DNH



## ABSTRACT

Ground water level Scenario during November-2024 highlighting the findings, status of ground water level in different aquifers and its annual and decadal comparison.

CGWB, WEST CENTRAL REGION, UT OF DAMAN, DIU AND DNH

## **INTRODUCTION**

Groundwater bulletin is prepared by CGWB, WCR, Ahmedabad depicting changes in groundwater regime of the country through different seasons. It is an effort to obtain information on groundwater levels through representative monitoring wells. The important attributes of groundwater regime monitoring are groundwater level. The natural conditions affecting the groundwater regime involve climatic parameters like rainfall, evapotranspiration etc., whereas anthropogenic influences include pumping from the aquifer, recharge due to irrigation systems and other practices like waste disposal etc.

Groundwater levels are being measured by Central Ground Water Board four times a year during January, May, August and November. Initially, the monitoring commenced in the year 1969 with the establishment of 2 observation wells spread uniformly over the entire state, and since then, the number of stations were added regularly so as to get proper hydrological information of different hydrogeological and geo-morphological units.

A network of 43 observation wells called National Hydrograph Network Stations (NHNS), as on 30.11.2024, located all over the state is being monitored. Index map showing in fig.1 and Administrative map shown in Fig.-2.

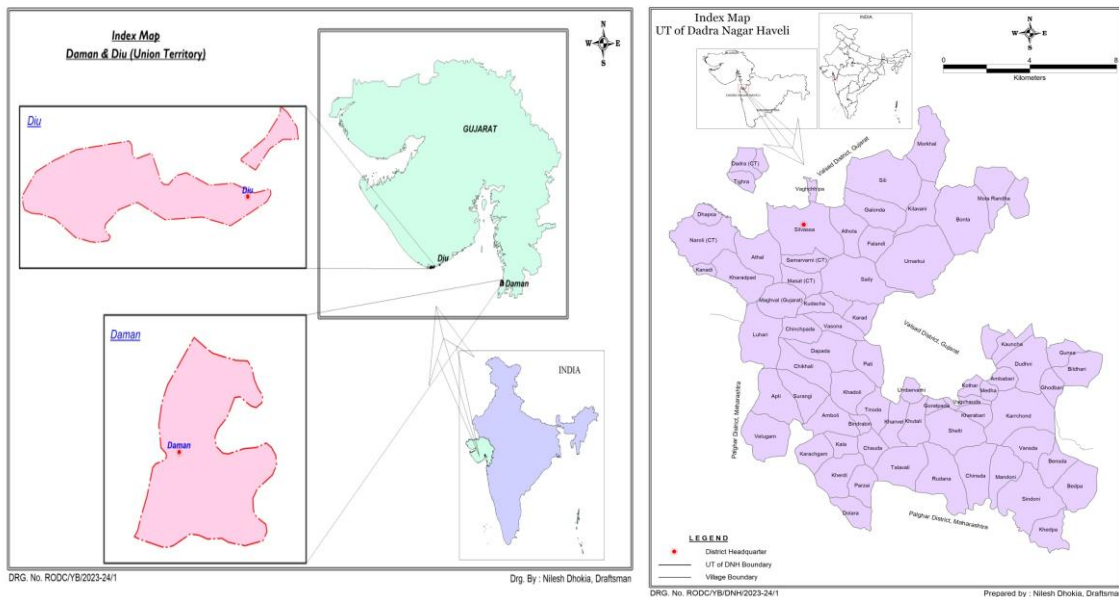


Figure 1: Index Maps of UT of DAMAN, DIU & DNH

## **STUDY AREA**

The West Central Region of Central Ground Water Board has jurisdiction over the Union Territory of Damam & Diu and Dadra and Nagar Haveli (UT of DDD). Damam & Diu covering an area of 112 sq km. Diu is an Island just south of Saurashtra coast and Damam is situated west of Vapi in the south and Dadra Nagar Haveli covering an area 491 sq km. (Fig 2)

Daman is situated between north latitudes 20°22' & 20°29'58" and east longitudes 72°49'42" & 72°54'43" and falls in Survey of India toposheet No. 46 D/15. It covers an area of 72 sq. km. Its length measures 11 km from extreme north to south and the width measures 8 km. from east to west. The UT is bounded on the north, east and south by Valsad district of Gujarat state and west by Arabian Sea.

Diu district of UT of DDD is situated in southern part of Saurashtra region of Gujarat State, in western India. The Diu district is situated between north latitudes 20°44'39" & 20°42'00" and east longitudes 70°52'26" & 71°00'24" and falls in Survey of India toposheet No. 41 L/14. Its east west extent is nearly 19.2 km and north south width is varying from 1 to 2.5 km. Out of the total area of 43.8 Sq Km, 26.84 Sq. Km is rural area and 17.76 Sq.km is urban area.

The Union Territory of Dadra and Nagar Haveli is situated on the western coast of India between states of Gujarat and Maharashtra. It lies between north latitudes 20° 02' and 20° 22' and east longitudes 72° 54' and 73° 14' and falls in Survey of India Topo sheet no. 46 D/15, 16, 46H/3 and H/4. The Territory is surrounded on the west, north and east by Valsad district of Gujarat State and in the south and southeast by Thane and Nashik districts of Maharashtra State.

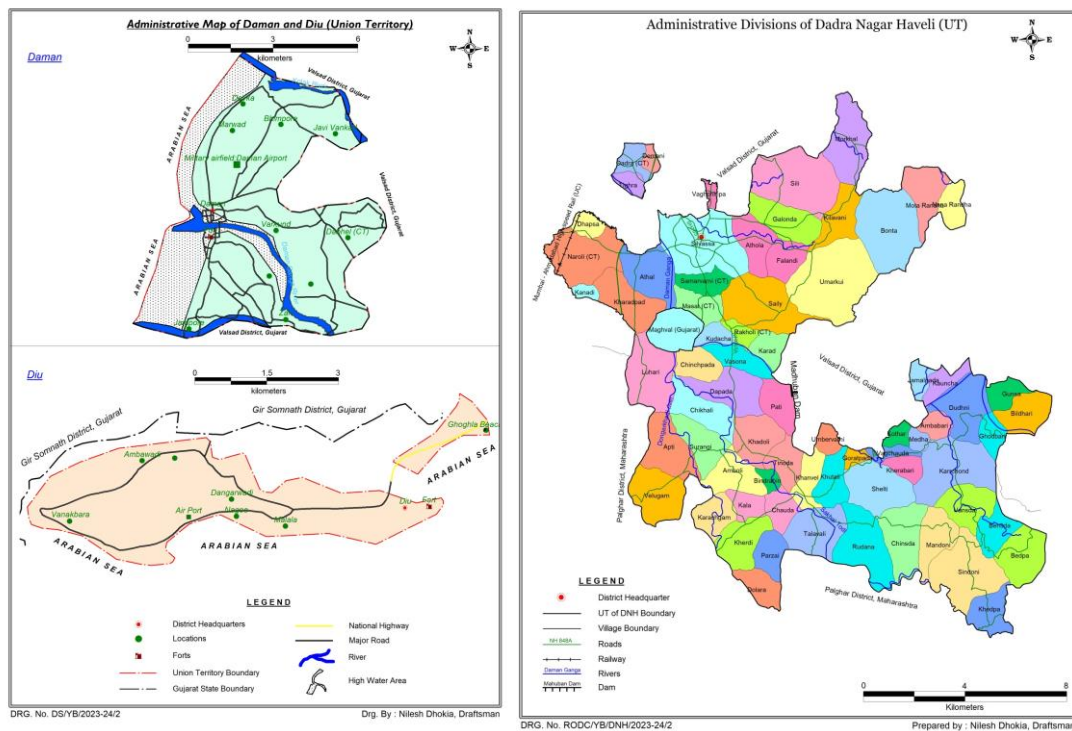


Figure 2: Map showing major aquifers and administrative divisions of Daman & Diu and Dadra and Nagar Haveli (UT of DDD).

## **GROUND WATER LEVEL MONITORING**

Central Ground Water Board, as a part of its national program, has established a network of observation wells in the UT of Daman, Diu and DNH for periodic monitoring of groundwater levels and to study its quality variation in time and space. WCR, has set up a network of observation wells known as the Ground Water Monitoring Wells (GWMW's) located all over UT of Daman, Diu and DNH which comprises 43 GWMWs. The distributions of monitoring wells in UT are given in Table 1. Map showing hydrograph stations monitored during the year and their distribution is presented as Fig. 3.

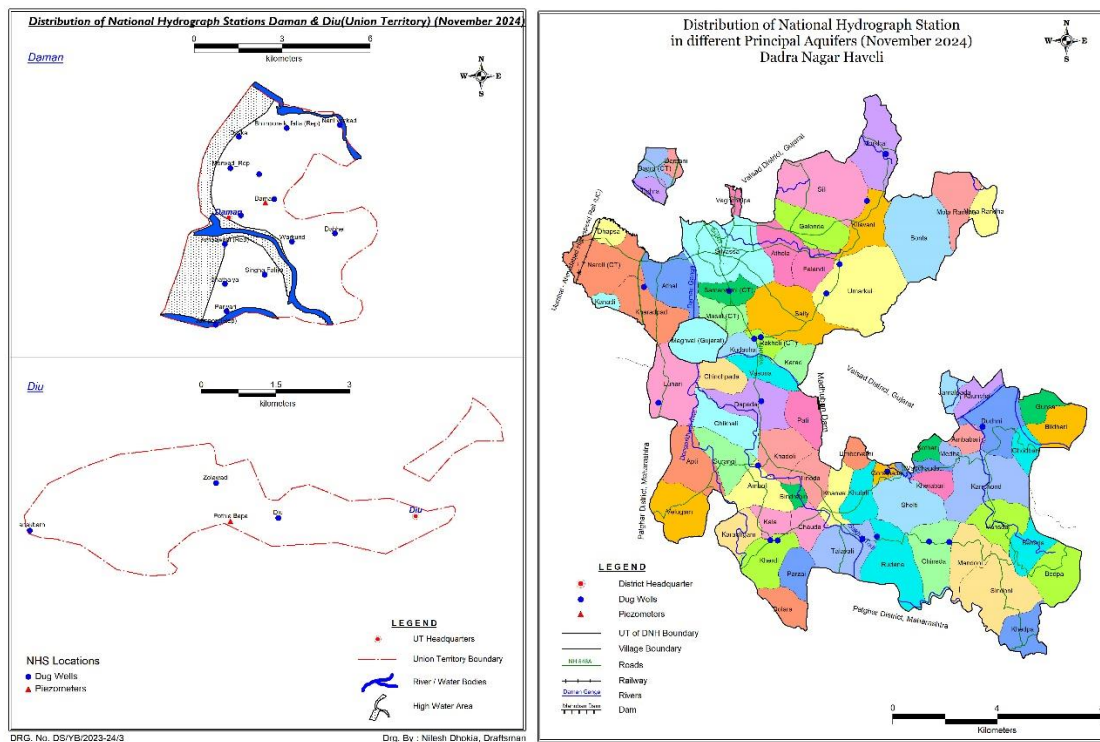


Figure 3: Distribution of NH Stations in UT of DAMAN, DIU & DNH

Table 1: District wise breakup of NH Stations in UT of DAMAN, DIU & DNH

S.No	District	HardRock		SoftRock		Total		
		DW	PZ	DW	PZ	DW	PZ	Total
1	Daman	15	1	0	0	15	1	16
2	Diu	0	0	6	2	6	2	8
3	Dadra and Nagar Haveli	18	1	0	0	18	1	19
U.T.Total		33	2	6	2	39	4	43

## GROUND WATER LEVEL SCENARIO

### Depth to Water Level in Unconfined Aquifer (November 2024) – UT of DAMAN, DIU & DNH

During November 2024 the depth to water level of unconfined aquifer range from 0.41 to 7.68 m bgl. The perusal of the depth to water level reveals that 50% of the monitoring stations falls in the ranges of 0 to 2 mbgl, 2 to 5 mbgl water level are observed in 47.4% and 5 to 10 mbgl water level are observed in 2.6% of the well in UT of Daman and Diu & Dadra and Nagar Haveli. Map and graph of Depth to Water Level in Unconfined Aquifer (November 2024) shown in Fig.4 and Fig.5 respectively

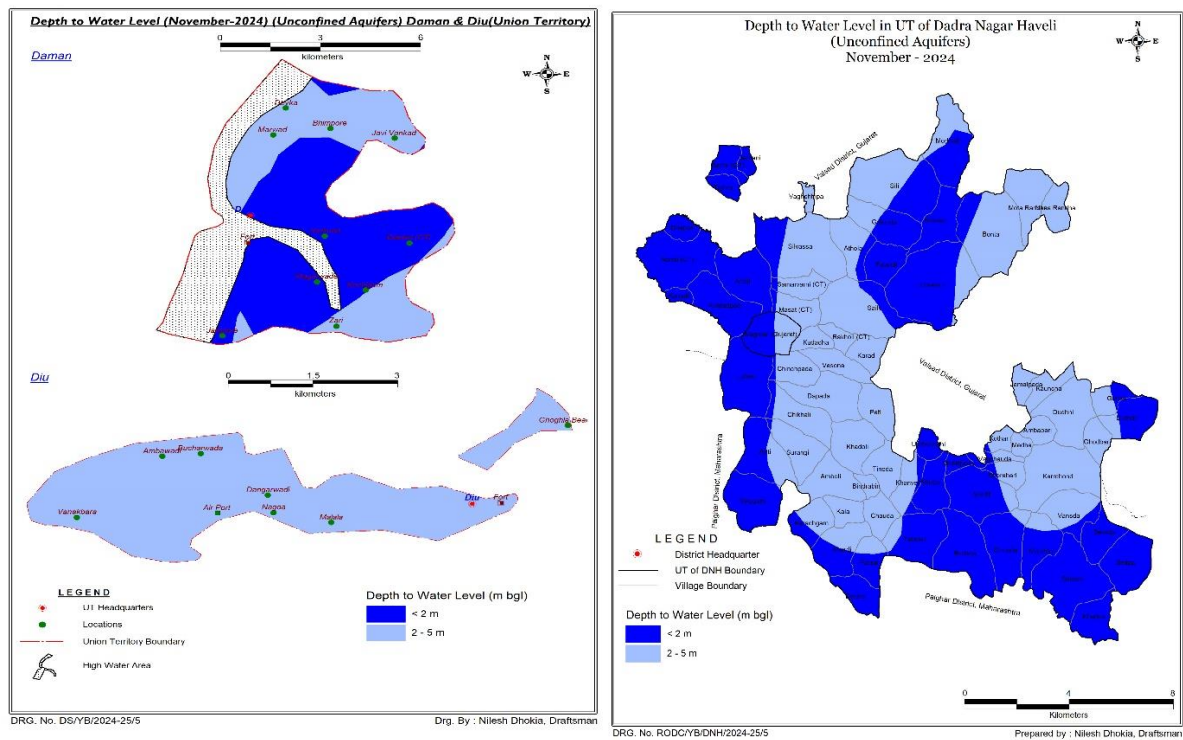


Figure 4: Depth to Water Level in UT of DAMAN, DIU & DNH-unconfined

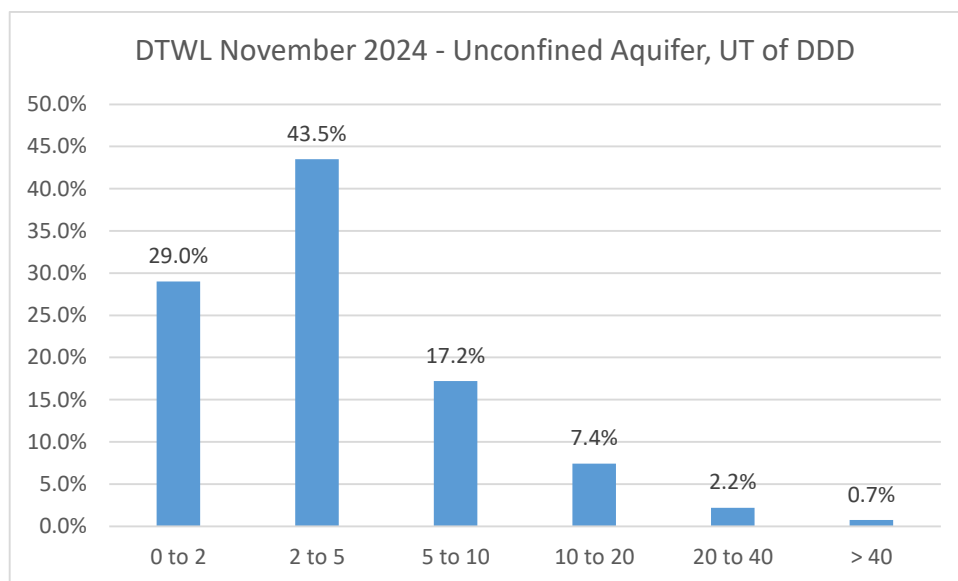


Figure 5: Graph of Depth to Water Level in UT of DAMAN, DIU & DNH - Unconfined



## Seasonal Water Level Fluctuation (May 2024 to November 2024) – Unconfined aquifer, UT of DAMAN, DIU & DNH

Out of the 35 well analysed 97.1% of the total wells in UT of Daman and Diu & Dadra and Nagar Havel shows a rise in water level. Rise in water level are observed in the range of 0 to 2 m in 11.4% of wells, 2 to 4 m in 37.1% of well and more than 4m in 48.6% of wells monitored in the Union Territory of Daman and Diu and Dadra and Nagar Haveli. The maximum rise of 11.75m is recorded in Dadra and Nagar Haveli whereas the minimum rise of 1.12 m is recorded in Diu. In UT of Daman only rise in water level is observed in November 2024 as compared to May 2024. Map and graph of Seasonal Water Level Fluctuation (May 2024 to November 2024)- Unconfined Aquifer, UT of DAMAN, DIU & DNH shown in Fig.6 and Fig.7 respectively.

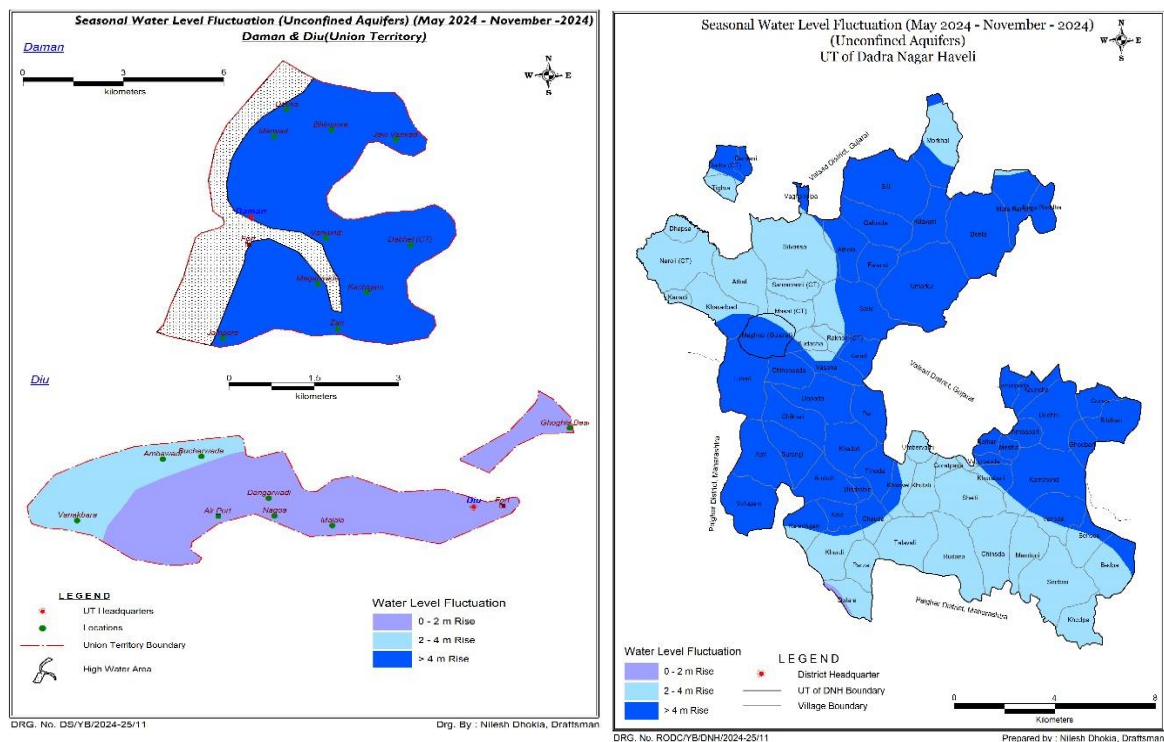


Fig. 6: Seasonal Water Level Fluctuation (May 2024 to November 2024)- Unconfined Aquifer, UT of DAMAN, DIU & DNH

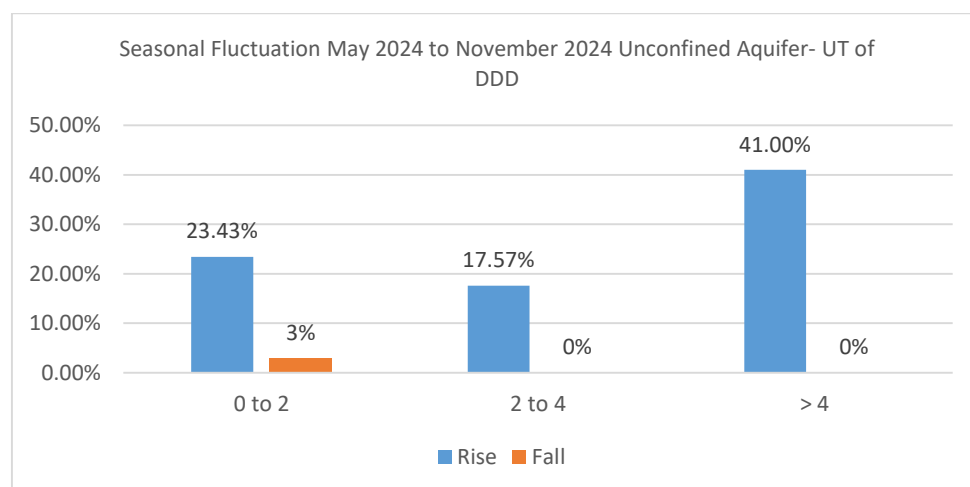


Fig. 7: Seasonal Water Level Fluctuation (May 2024 to November 2024)- Unconfined Aquifer, UT of DAMAN, DIU & DNH

## Annual Water Level Fluctuation (November 2023 to November 2024) – Unconfined- UT of DAMAN, DIU & DNH

Annual Water Level Fluctuation reveals that 79.3 % of total monitoring well in the UT of Daman and Diu & Dadra and Nagar Haveli shows a rise in water level and fall observed in 20.7%. Rise in water level within range of 0 – 2 m is observed in about 58.6% of wells, 2 to 4 m in 17.2% wells and 3.4% of wells showing rise greater than 4 m. Fall in the range of 0 – 2 m experienced by 20.7% of wells. In the UT, rise in water level range from 0.72 to 3.18 m bgl; 0.15 m to 5.57 m in DNH; in Daman whereas in Diu no well is showing rise. Fall in water level range from 0.1 to 0.77m bgl in Daman whereas 0.05 to 1.51m bgl in Diu and 0.05 to 1.15 m in DNH.

Map and graph of Annual Water Level Fluctuation (November 2023 to November 2024)- Unconfined of UT of DAMAN, DIU & DNH shown in Fig.8 and Fig.9 respectively.

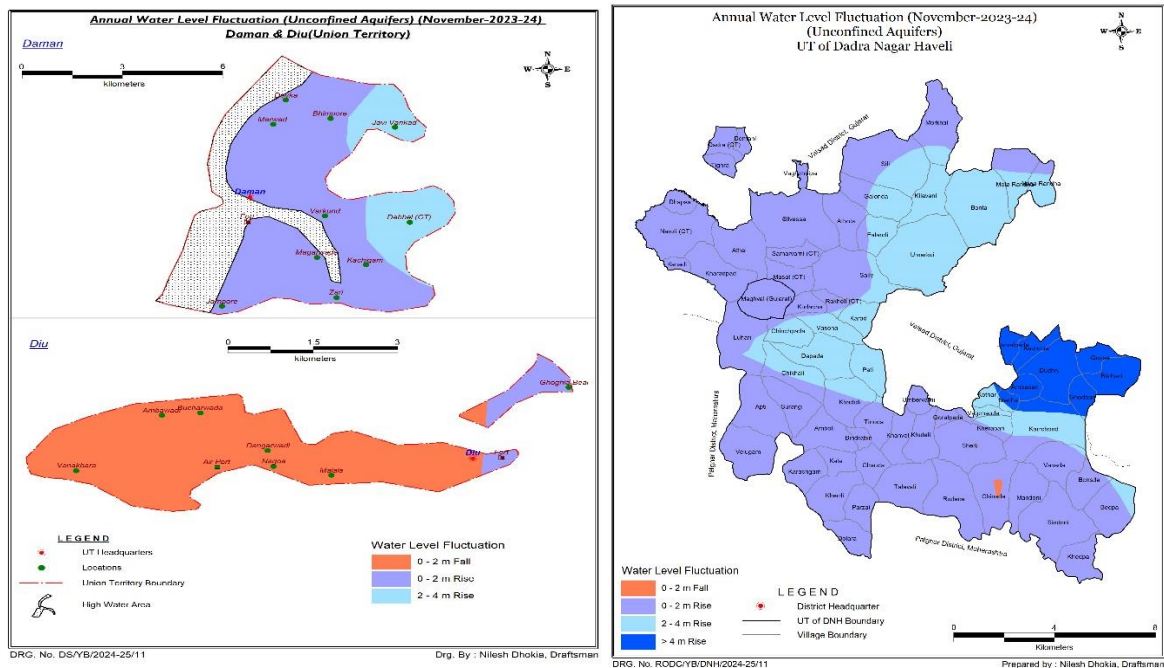


Fig. 8: Annual Water Level Fluctuation (November 2023 to November 2024)- Unconfined of UT of DAMAN, DIU & DNH

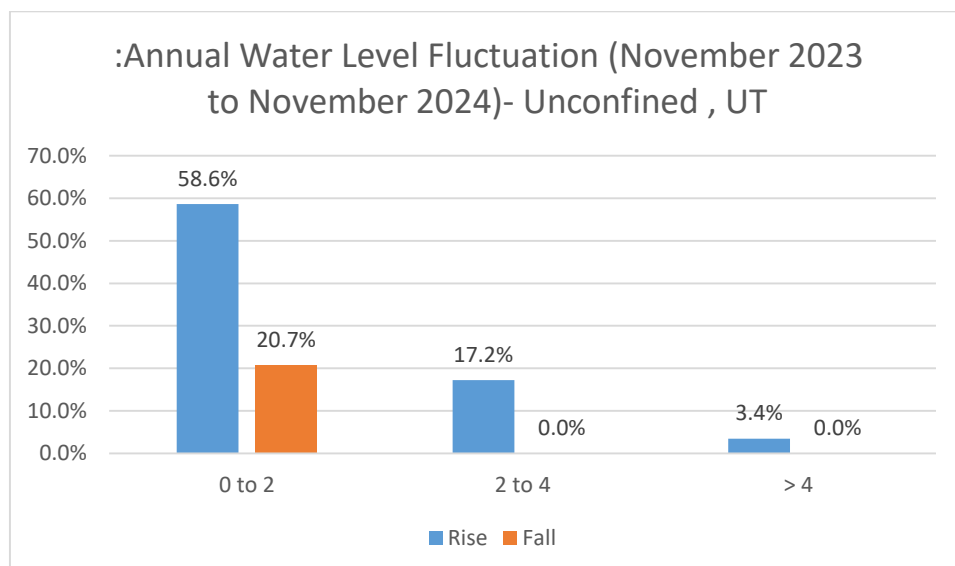


Fig. 9: Annual Water Level Fluctuation (November 2023 to November 2024)- Unconfined Aquifer of UT of DAMAN, DIU & DNH

## Decadal Fluctuation in Unconfined Aquifer (Decadal average of November (2014-23) to November 2024) - UT of DAMAN, DIU & DNH

A comparison of the water level of the November 2024 with the average water level of the November for last one decade (2014-23) reveals that there is a rise in (80% of well analysed) and fall in 20% of well analysed. Rise of 63.3% of well show in the range of 0 – 2 m and 16.7% shows in range of 2- 4 m. Fall is only in the range of 0 to 2 m. The maximum rise of 3.41 m is recorded in Dadra and Nagar haveli whereas the maximum decline of 1.51m is recorded in Diu.

In Union Territory of Daman, rise in water level ranges from 0.03 to 2.44 m and fall is from 0.19 to 0.32 m where as in UT of Diu, rise in water level is 1.57m and fall range from 0.05 to 1.51 m. In Union Territory of DNH, rise in water level ranges from 0.04 to 3.41 m and fall is 0.08 m.

Map and graph of Decadal Fluctuation in Unconfined Aquifer (Decadal average of November (2014 to 2023) to November 2024) of UT of DAMAN, DIU & DNH shown in Fig.10 and Fig.11 respectively.

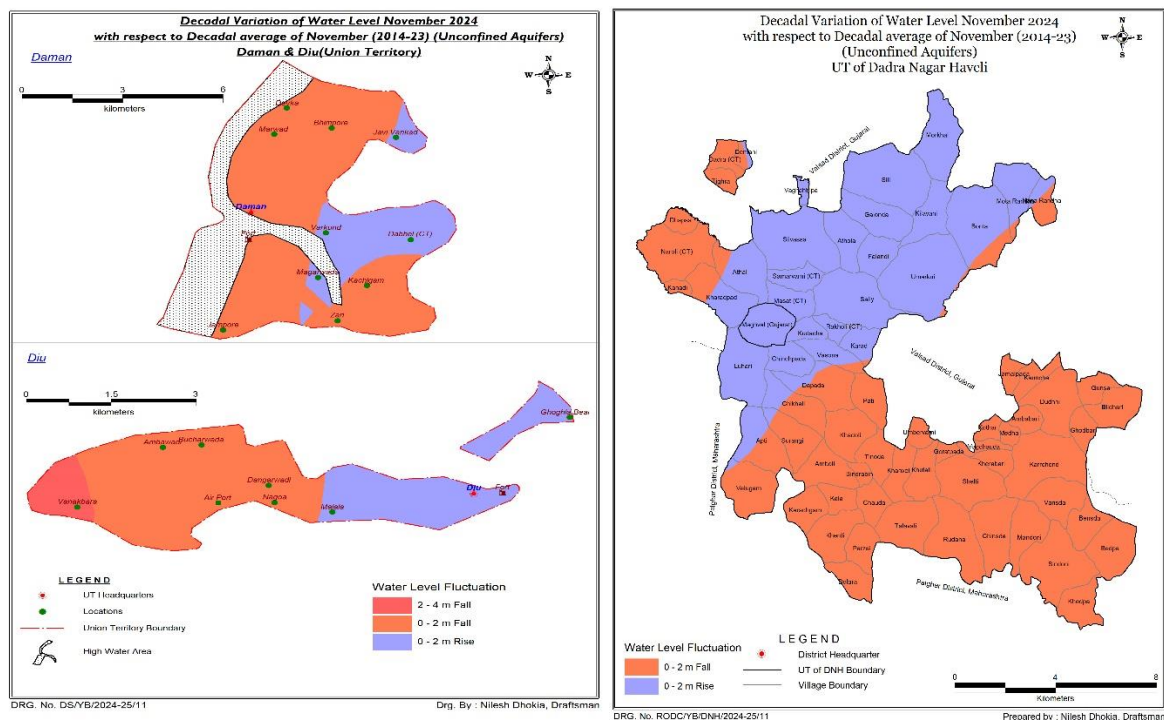


Fig. 10: Decadal Fluctuation in Unconfined Aquifer (Decadal average of November (2014 to 2023) to November 2024) of UT of DAMAN, DIU & DNH



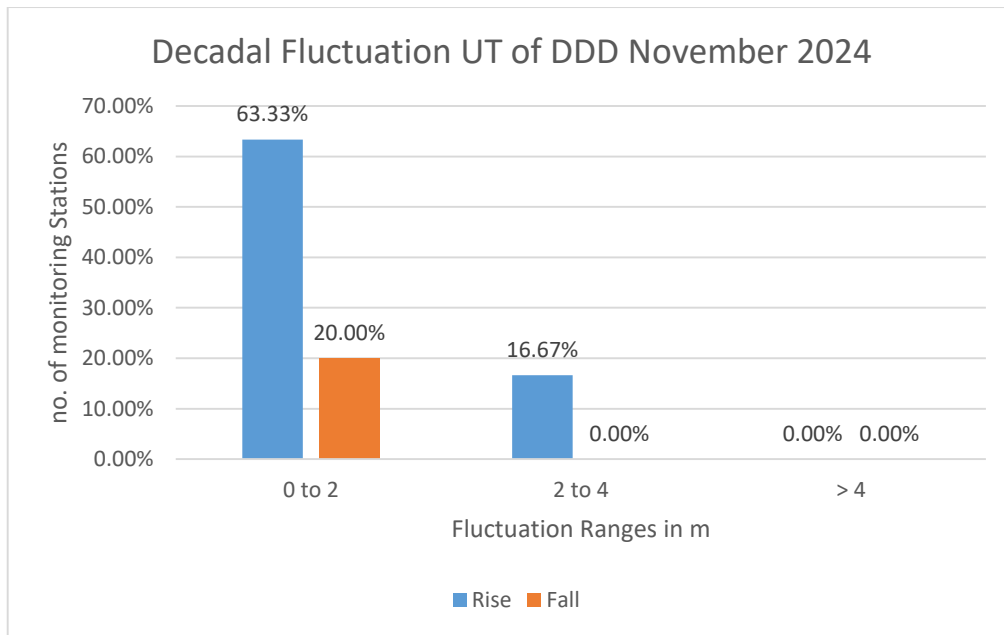


Fig. 11: Decadal Fluctuation in Unconfined Aquifer (Decadal average of November (2014 to 2023) to November 2024) of UT of DAMAN, DIU & DNH