Pakistan Meteorological Department

Monthly Drought Bulletin
For the Month of February 2025

Highlights

- In February 2025, Khyber Pakhtunkhwa (KP), northeast Punjab, northwest Baluchistan, Kashmir, and Gilgit Baltistan (GB) experienced moderate to heavy rainfall.

- During the month, the mean monthly temperatures across the country were observed to be 1°C to 8°C above the historical norm. However, exceptions were noted in Rohri, Gwadar, Zhob, Chitral, Dir, and Kohat, where the recorded temperatures were significantly below the 30-year average.

- In March 2025, northern Punjab, Kashmir, and adjacent areas of northern Khyber Pakhtunkhwa are likely to get slightly below normal rainfall. While, southern regions are expected to align with typical climatic patterns and may receive near-normal rainfall. Gilgit-Baltistan and northern Khyber Pakhtunkhwa may also experience normal rainfall during this period.

- During March 2025, mean temperatures are expected to remain above normal nationwide, with maximum departure over Kashmir, Gilgit Baltistan and northern Khyber Pakhtunkhwa.

- Slightly below normal to near normal rains during March, 2025 may negatively affect soil moisture level over drought prone areas of the country.

- Keeping in view the weather forecast for the month of March 2025, disaster management authorities may be requested to plan DRM activities accordingly in the drought effected areas of Balochistan and Sindh.

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1. Monthly Rainfall and Temperature Analysis for the Month of February, 2025

During the month, Khyber Pakhtunkhwa (KP), Punjab, northern Baluchistan, Kashmir, and Gilgit Baltistan (GB) experienced moderate to heavy rainfall. The spatial distribution of this rainfall is illustrated in Figure 1. The largest amounts were recorded in upper KP, Kashmir, and northeast Punjab, as detailed in Table 1.

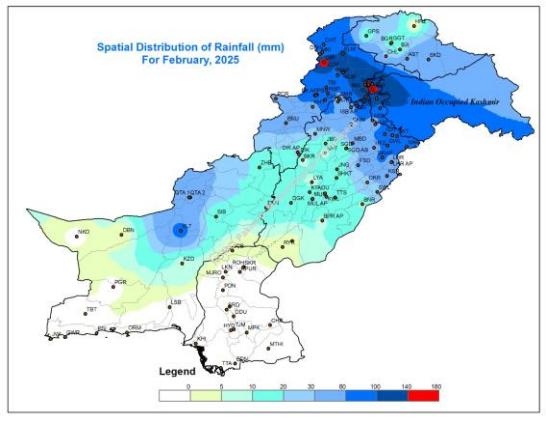

Figure 1: Spatial Distribution of rainfall

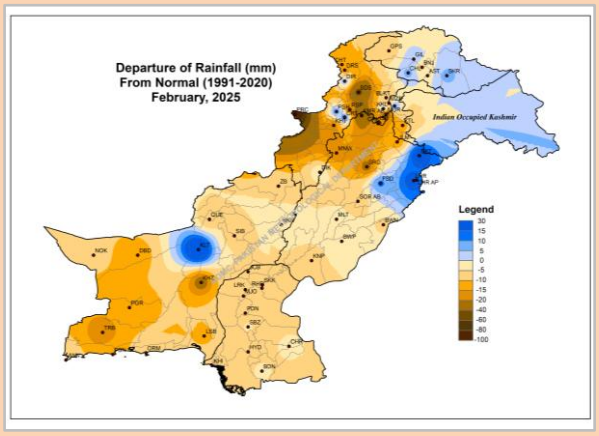

Figure 2: Departure of rainfall from Normal

Figure 2 illustrates the deviation of rainfall from the normal (1991-2020) levels. Below-normal rainfall was observed across the country, except in northeast Punjab, Kalat, Dir, Muzaffarabad, and Gilgit Baltistan.

Table-1: Chief amount of rainfall recorded across Pakistan during the month of February, 2025

Sr.No.	Station	Rainfall(mm)	Sr.No.	Station	Rainfall(mm)
1	Dir	182.0	11	Kalam	102.0
2	G.Dopatta	170.3	12	Lower Dir	99.0
3	Muzaffarabad City	156.9	13	Mirkhani	95.8
4	Muzaffarabad Airport	143.1	14	Cherat	95.0
5	Balakot	136.0	15	Narowal	94.8
6	Murree	135.1	16	Kotli	88.0
7	Rawalakot	123.5	17	Gujrat	86.0
8	Pattan	122.0	18	Saidu Sharif	82.0
9	Malamjabba	113.0	19	Peshawar Airbase	79.3
10	Kakul	111.0	20	Bacha Khan A/P	76.5

Figure 3 shows the distribution of mean temperatures recorded at PMD stations in February 2025. During this period, southern Sindh and coastal Baluchistan recorded mean maximum temperatures reaching 23°C.

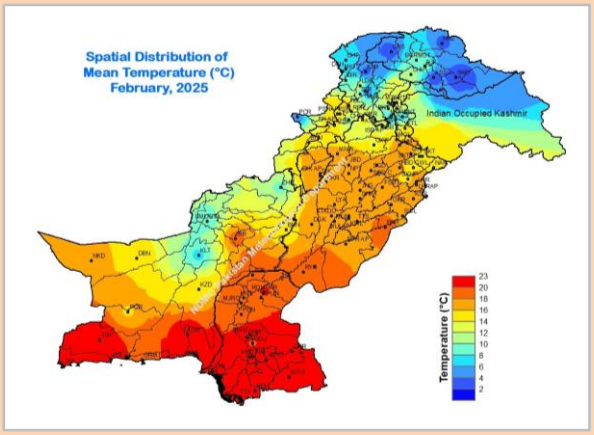

Figure 3: Monthly Mean Temperature (°C)

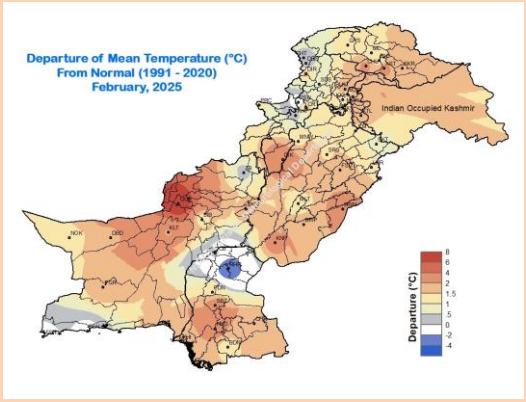

Figure 4: Monthly Departure from Normal Temperature

Figure 4 illustrates the deviation of mean temperatures from the normal (1991-2020), indicating that most parts of the country experienced temperatures 1 to 8°C above the normal range. However, Rohri, Gwadar, Zhob, Chitral, Dir, and Kohat recorded temperatures below the 30-year average.

Figures 5 and 6 display the monthly normal rainfall and mean temperatures for February, based on data from 1991 to 2020, respectively.

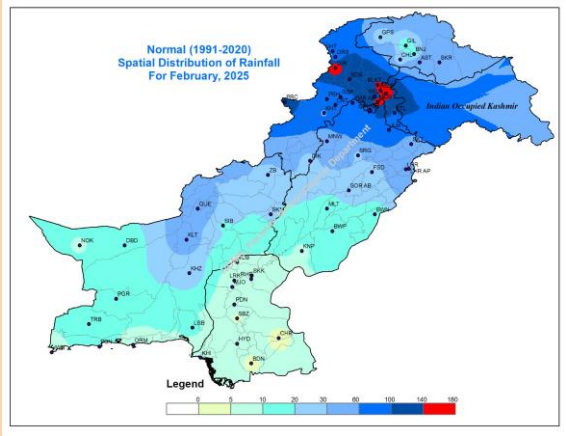

Figure 5: Monthly Normal Rainfall (mm)

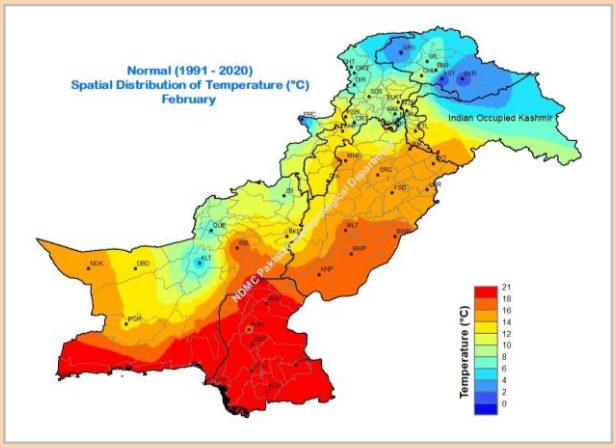

Figure 6: Monthly Mean Temperature (°C)

2. Comparison of Actual to Normal Monthly Rainfall for February, 2025

Figure 7 compares actual rainfall to the historical normal (1991-2020) for February 2025. This comparison is detailed separately for different regions: Khyber Pakhtunkhwa 7(a), Sindh in Figure 7(b), Punjab in Figure 7(c), Balochistan in Figure 7(d), Gilgit Baltistan, and Azad Jammu & Kashmir in Figure 7(e).

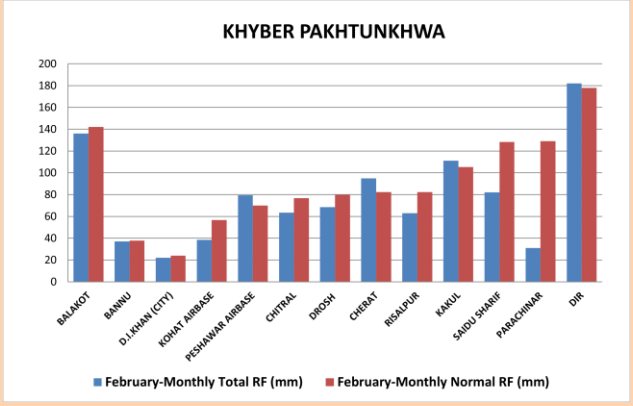

Figure 7a

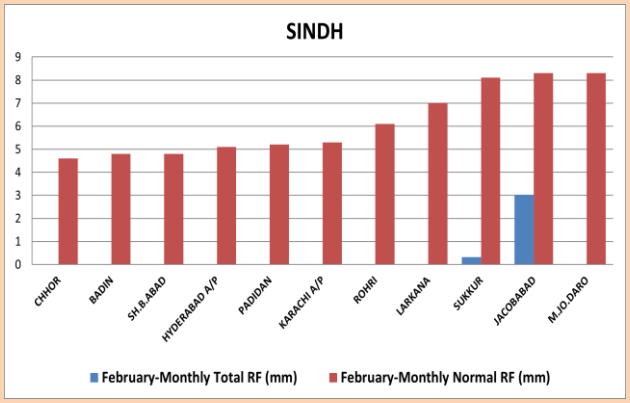

Figure 7b

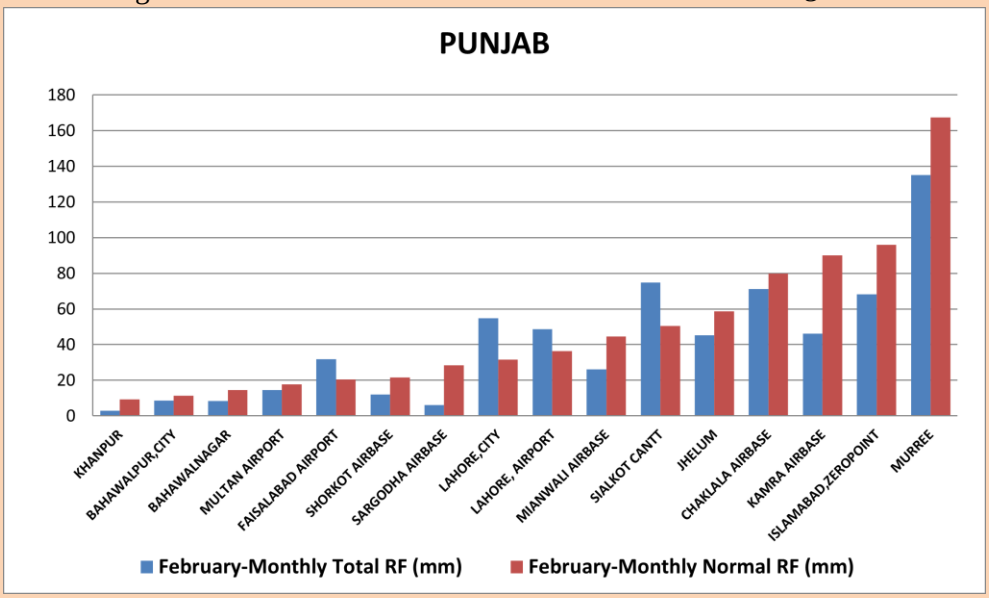

Figure 7c

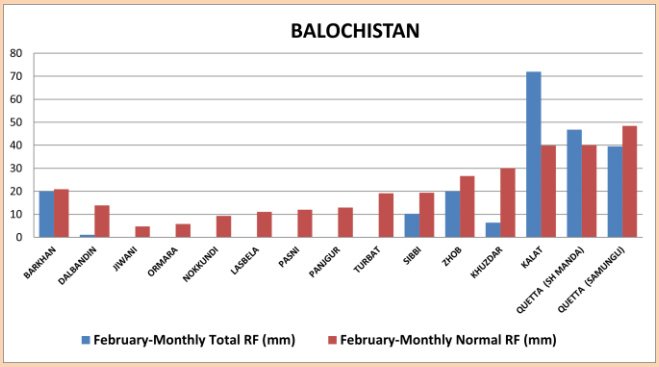

Figure 7d

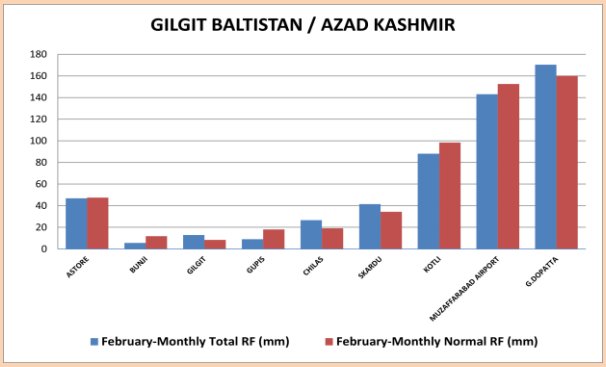

Figure 7e

3. Normalized Difference Vegetation Index (NDVI)

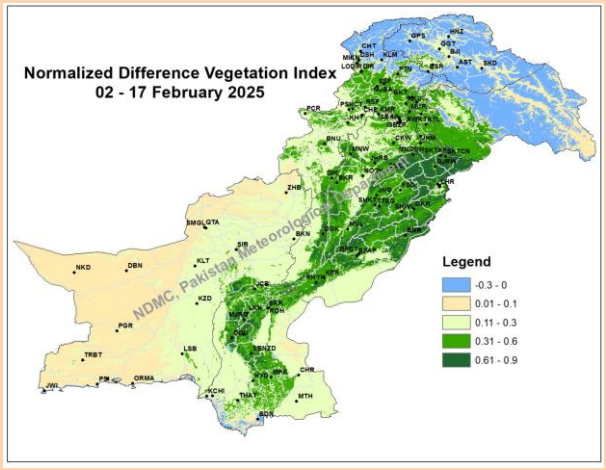

Figure 8: NDVI

Figure 8 presents the Normalized Difference Vegetation Index (NDVI) values for February 2025. High NDVI values are observed in AJK, Punjab, Khyber Pakhtunkhwa, and along the Indus basin, indicating extensive vegetation in these areas. These conditions support the accumulation of chlorophyll in plants, thereby enhancing vegetation cover. Conversely, low rainfall has resulted in low or deficient NDVI values in the rainfed regions of Baluchistan and Sindh.

4. Land Surface Temperature (LST)

Figure 9 depicts the Land Surface Temperatures (LST) from February 2 to February 9, 2025. During this period, southeast Punjab, northeastern Sindh, and the coastal areas of Baluchistan and Sindh experienced average daytime temperatures ranging from 15-22°C.

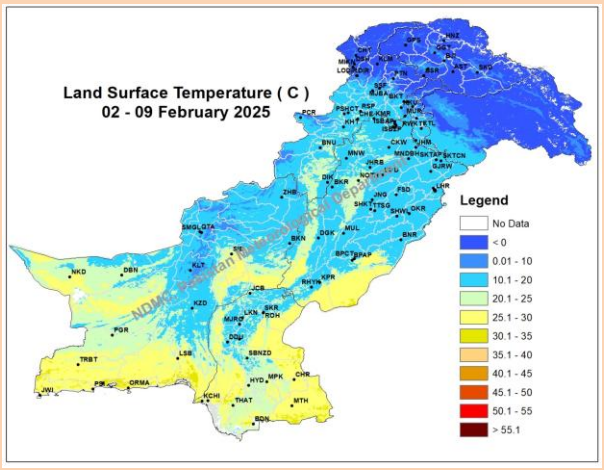

Figure 9: LST (°C) 2-9 Feb, 2025

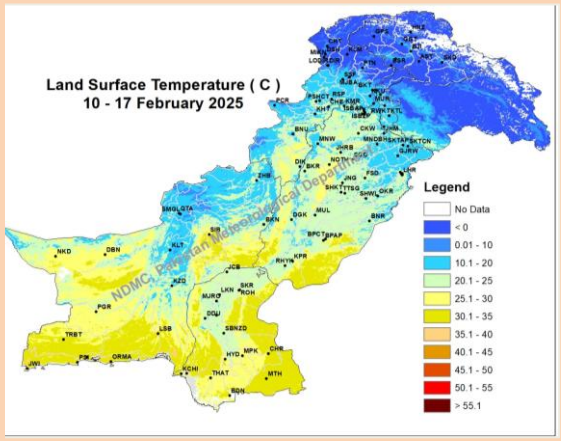

Figure 10: LST (°C) 10-17 Feb, 2025

Figure 10 illustrates the Land Surface Temperatures from February 10 to 17. During this period, there was an increase in temperature compared to the previous week in western Baluchistan, northeast Sindh, and southeast Punjab.

5. Temperature Vegetation Dryness Index (TVDI)

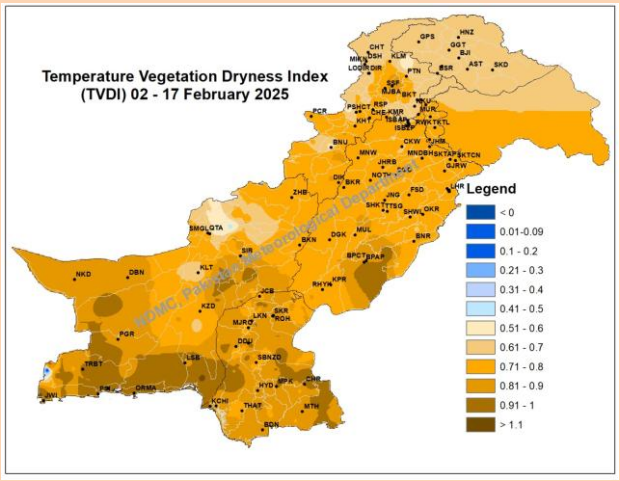

Figure 11: TVDI

Figure 11 displays the Temperature Vegetation Dryness Index (TVDI), derived from MODIS datasets MOD13A2 (NDVI) and MOD11A2 (LST). The TVDI Index highlights moderate dry-like conditions in western Balochistan, Sindh, and Bahawalpur (Punjab). These conditions indicate the onset of dryness and soil moisture deficiency in the western and coastal regions of Balochistan. The deficit in rainfall has exacerbated these conditions, leading to drought-like situations that require efficient measures for mitigation.

6. Length of Consecutive Dry Days upto February 28, 2025

Figure 12 presents the maximum length of consecutive dry days (CDD). The number of consecutive dry days has increased from 178 to 206 days across Turbat, Lesbella, and Sindh. In contrast, substantial rainfall has concluded the CDD in the central and northern regions of the country.

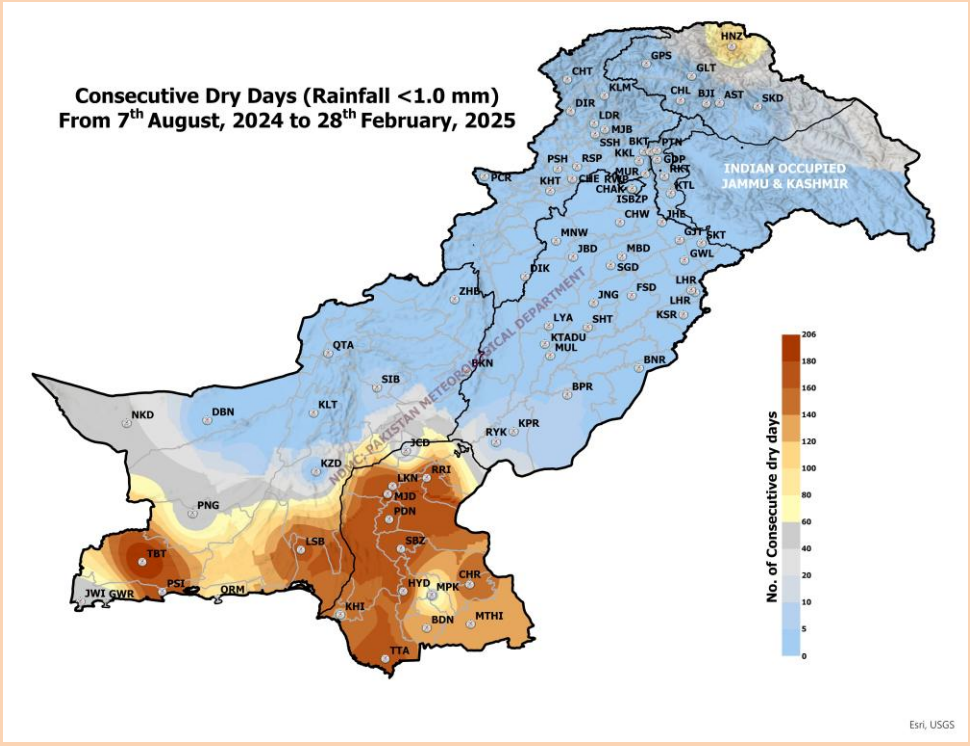

Figure 12: No. of consecutive dry days

7. Drought Monitor for the Month of February, 2025

Based on the different drought monitoring indices, as narrated above and ground station data observed by the Pakistan Meteorological Department Network across the country, the spatial drought monitor map is represented in Figure 13 below.

Western Balochistan, Sindh, and southeast Punjab are currently facing conditions ranging from mild to moderate drought, attributed to moisture stress and lower-than-average rainfall over the previous three months.

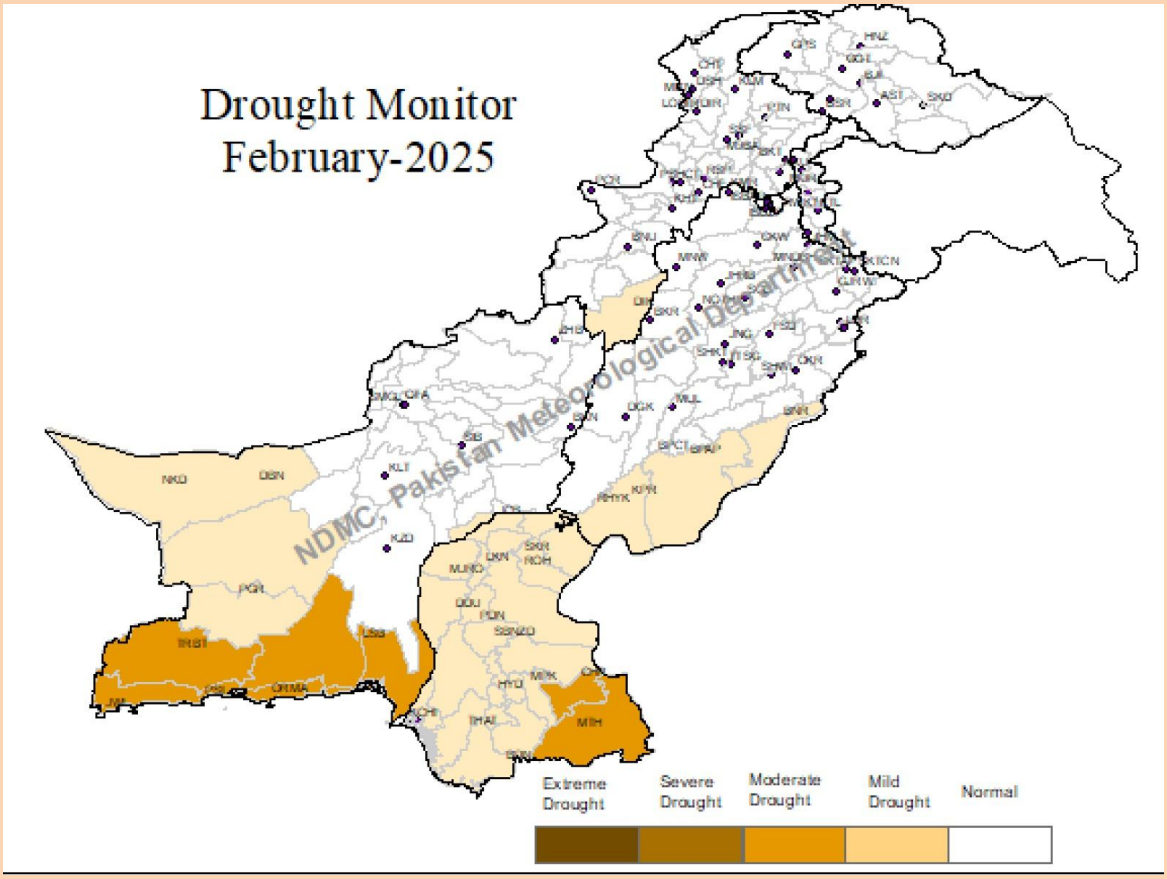

Figure 13: Drought Monitor of Pakistan for the month of February, 2025

8. Water availability/ Dams flow data:

During the month, water inflow, outflow and levels of the Rawal, Khanpur, Tarbela , and Mangla dams are shown in Figure 14. The water level at Mangla, Tarbela, Rawal and Khanpur reservoirs has started to decrease due to less amount of rainfall received during the month and excess amount of released water due to prolonged dry spell.

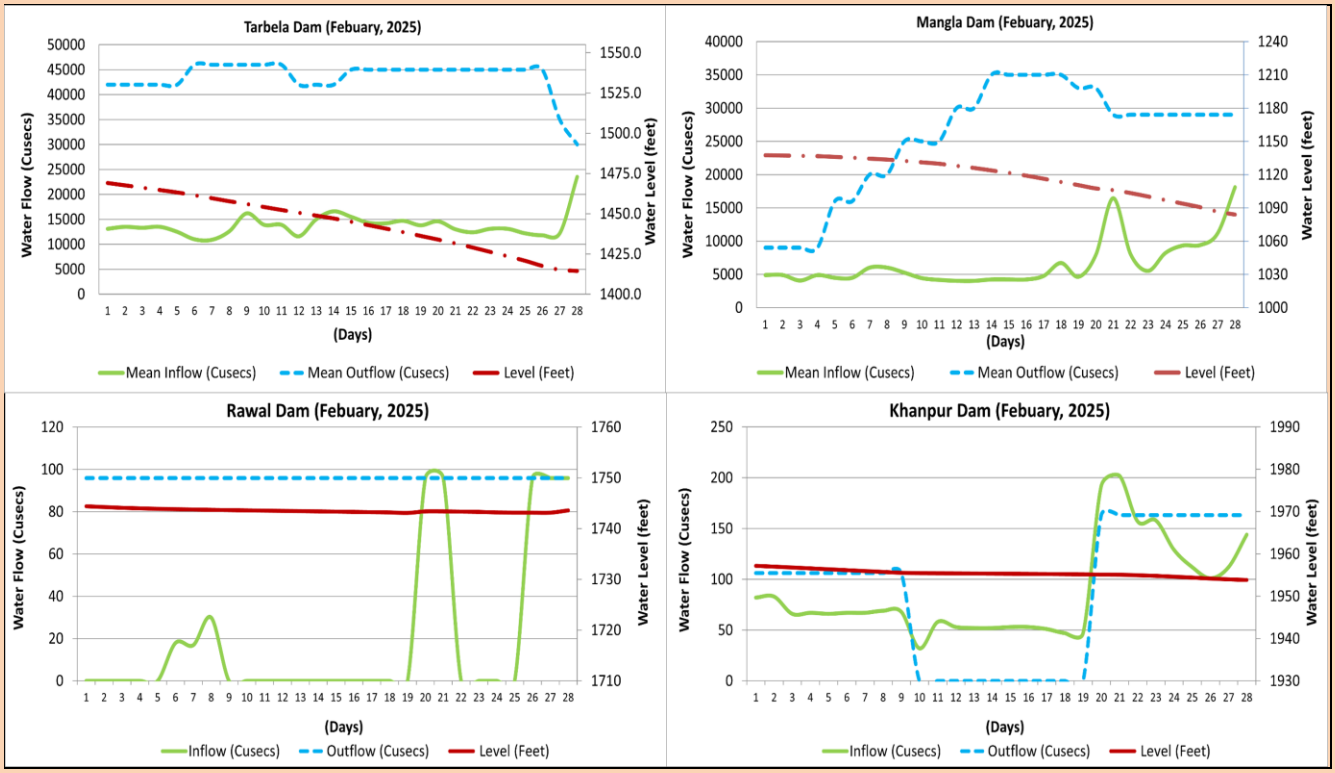

Figure 14: Water inflow, outflow and level of Rawal, Khanpur, Tarbela and Mangla Dams, Feb, 2025

9. Weather Outlook for March, 2025

For March 2025, forecasts indicate a trend toward slightly below-normal rainfall in northern Punjab, Kashmir, and adjacent areas of northern Khyber Pakhtunkhwa. Conversely, southern regions are expected to receive rainfall closer to their climatological norms, with a lesser negative deviation. Gilgit-Baltistan and northern Khyber Pakhtunkhwa are predicted to receive nearly normal rainfall during this period.

Mean temperatures are expected to remain above normal nationwide, with maximum departure over Kashmir, Gilgit Baltistan and northern Khyber Pakhtunkhwa.

10. Drought Outlook for March, 2025

The forecast for March 2025 predicts slightly below-normal rainfall, which is likely to exacerbate soil moisture deficits in drought-prone areas such as coastal Balochistan, the Thar Desert in Sindh, and the Cholistan region in Punjab. Mild to moderate drought conditions already present in Sindh and coastal Baluchistan may intensify if the rainfall remains deficient.

All stakeholders across the countrty are advised to make efforts to save and judicious use of the available water to mitigate the adverse impacts of drought.

11. Crop Condition

- Punjab's agriculture features major crops like wheat, sugarcane, sesame, grams, and pulses, primarily thriving in its irrigated plains. Soil moisture condition has improved due to recent rainfall.
- Sindh reports satisfactory growth and harvesting processes for its primary crops, including wheat, sugarcane, seasonal vegetables, and orchards. The crop conditions remain generally good, supported by adequate management practices.
- In Khyber Pakhtunkhwa, all standing crops such as wheat and sugarcane are progressing well, with ongoing harvesting and satisfactory orchard conditions.
- Baluchistan enjoys satisfactory growth of wheat, orchards, and vegetables, with seasonal fruits continuing to be produced and marketed effectively. Yet, specific parts of the province suffer from moisture stress due to persistent dry conditions, influencing crop development.
- Gilgit Baltistan shows promising agricultural performance with crops like potatoes, orchards, and vegetables all reported to be growing satisfactorily. This region maintains stable agricultural output, reflecting effective cultivation practices.

12. Advice for Farmers

- Normal to slightly below normal rainfall is expected in most agricultural plains during March. Further soil moisture stress is likely due to below normal precipitation during March.
- To achieve a good yield, it is necessary to control weeds in the crop, which not only reduces the yield but also other negative impacts. Apply herbicides to destroy these weeds. Do not spray during strong winds and follow the advice of the agricultural department.

- As the wheat crop will be entering the heading stage, the growth of crops will accelerate with the gradual increase in temperature this month. It is crucial to water the crops thoroughly during this phase.
- However, judicious use of available water stock is recommended for the lower half of the country.

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