Pakistan Meteorological Department

Monthly Drought Bulletin for July, 2025

Highlights

- In July 2025, during the month, most parts of the country received rainfall, whereas, western Baluchistan still remained dry.
- During the month, temperatures in upper and western parts of the country were 1 to 4°C above the normal range.
- The forecast for August 2025 predicts near-normal to above-normal rainfall across most parts of Pakistan, with northeastern Punjab, Kashmir, and southeastern Sindh expected to receive significantly above-normal precipitation
- Above-normal mean temperatures are anticipated in the mountainous northern and western regions, while the plains of Punjab and Sindh should maintain near-normal temperature ranges.
- The forecast of normal to slightly above normal rainfall is likely to improve water availability in the country except western Balochistan.
- Keeping in view the weather forecast for the month of August 2025, disaster management authorities are requested to plan DRM activities accordingly in the drought effected areas of Baluchistan.

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1. Monthly Rainfall and Temperature Analysis for July, 2025

During the month, most parts of the country—**particularly the northeastern regions**—received rainfall, while western Balochistan remained dry. The spatial distribution of this rainfall is illustrated in Figure 1. The highest amounts were recorded in the Pothohar region, northeast Punjab, and Kashmir, as detailed in Table 1.

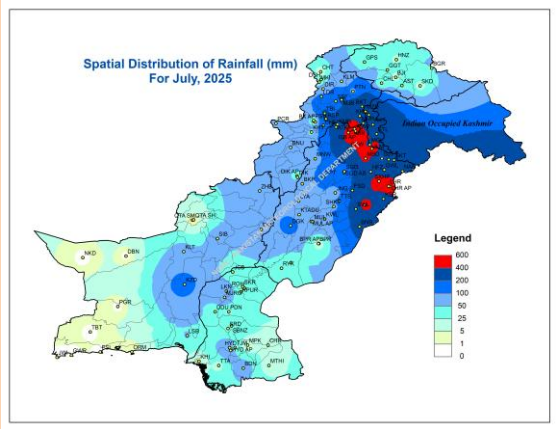


Figure 1: Spatial Distribution of rainfall

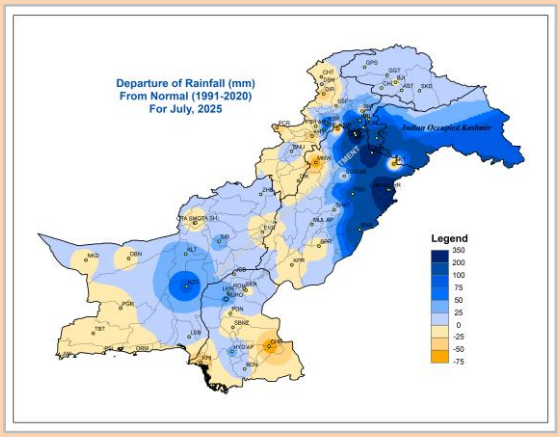


Figure 2: Departure of rainfall from Normal

Figure 2 illustrates the deviation of rainfall from normal (1991–2020) levels. Above-normal rainfall was recorded in northeastern Punjab, Kashmir, the Pothohar region, and parts of northeastern Balochistan. In contrast, below-normal rainfall was observed in southern Sindh, western Khyber Pakhtunkhwa (KP), and western Balochistan—region already experiencing drought conditions.

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

Sr. No.	Station	Rainfall(mm)	Sr. No.	Station	Rainfall(mm)
1	Islamabad, ZP	611.7	11	Chakwal	382.3
2	Jhelum	594.5	12	Kakul	372.0
3	Chaklala A/P	557.0	13	Murree	364.0
4	Sheikhupura	538.0	14	Mangla	348.6
5	Lahore A/P	527.9	15	Muzaffarabad A/P	346.0
6	Okara	494.8	16	Muzaffarabad City	337.0
7	Lahore City	472.3	17	Narowal	308.2
8	Mandibahauddin	434.1	18	Hafizabad	308.2
9	Islamabad, A/P	425.4	19	Attock	284.0
10	Kotli	392.4	20	Gujranwala	281.8

Figure 3 shows the spatial distribution of mean temperatures recorded at PMD stations during July 2025, highlighting variations across the country. Most regions experienced mean temperatures between 32°C and 38°C. In contrast, upper Khyber Pakhtunkhwa (KP) and Gilgit-Baltistan (GB) recorded relatively lower mean temperatures, ranging from 20°C to 26°C. Higher temperature zones were observed in upper Sindh and the Chagai district, where mean temperatures ranged between 36°C and 38°C.

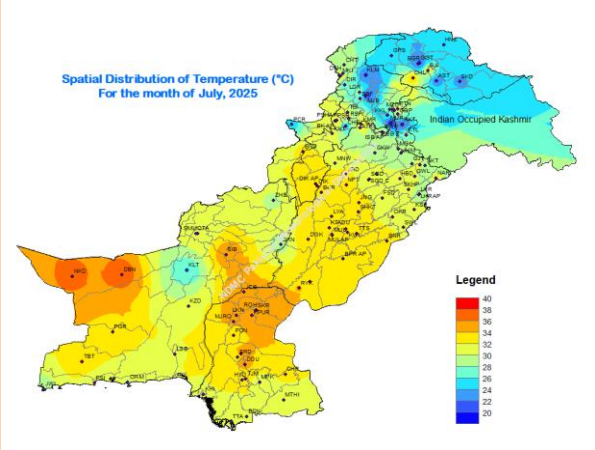


***Figure 3**: Monthly Mean Temperature (°C)*

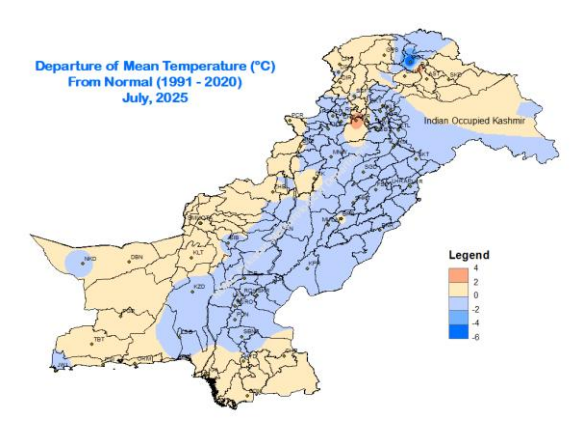


***Figure 4**: Monthly Departure from Normal Temperature*

Figure 4 illustrates the deviation of mean temperatures from the normal (1991-2020) range. Most western regions, northern areas, and southern Sindh experienced above-normal temperatures, reaching up to 4°C higher than average. In contrast, the rest of the country recorded below-normal temperatures, with deviations of up to 6°C. Figures 5 and 6 display the monthly normal rainfall and mean temperatures for July, based on 1991-2020 climatological data.

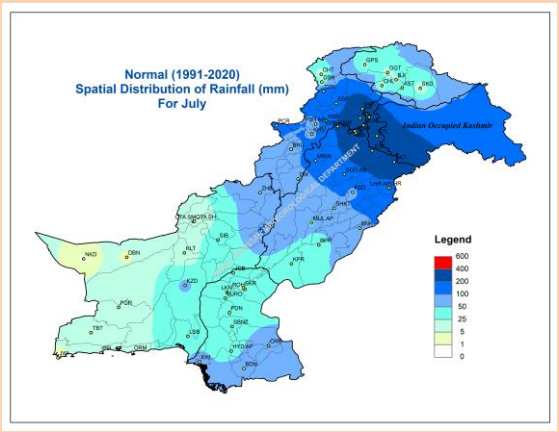


***Figure 5**: Monthly Normal Rainfall (mm)*

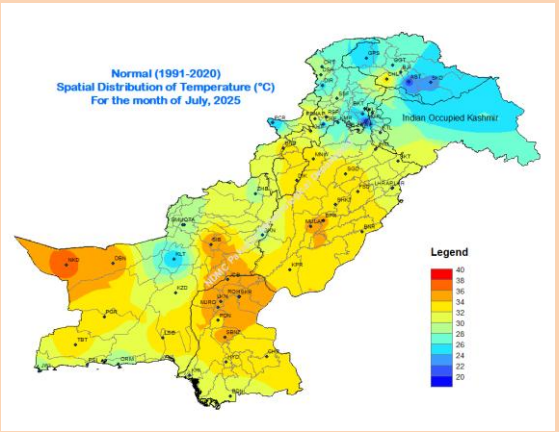


***Figure 6**: Monthly Normal Mean Temperature (°C)*

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

Figure 7 presents a comparison between actual rainfall in July 2025 and the historical normal (1991-2020) across different regions: Khyber Pakhtunkhwa (Figure 7a), Sindh (Figure 7b), Punjab (Figure 7c), Balochistan (Figure 7d), as well as Gilgit-Baltistan and Azad Kashmir (Figure 7e). The analysis reveals that rainfall during the month exceeded normal levels in all regions except western Balochistan.

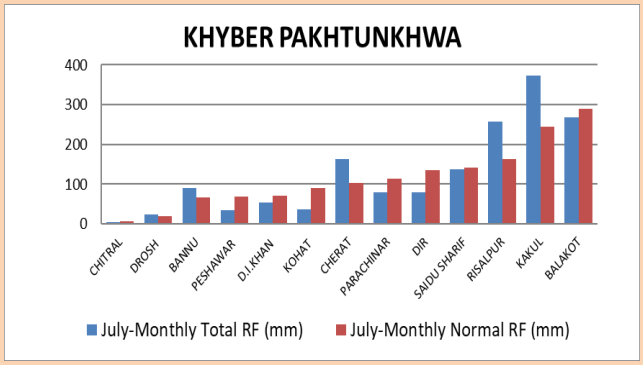


Figure 7a

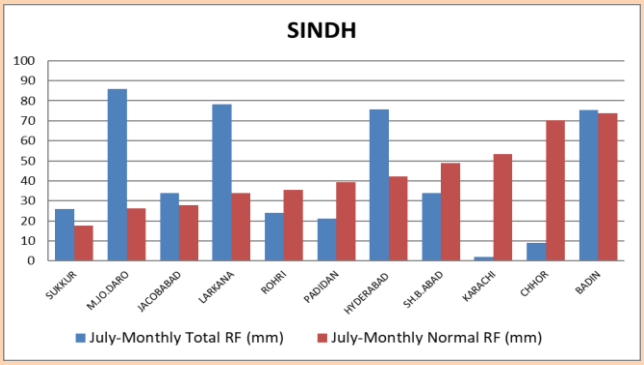


Figure 7b

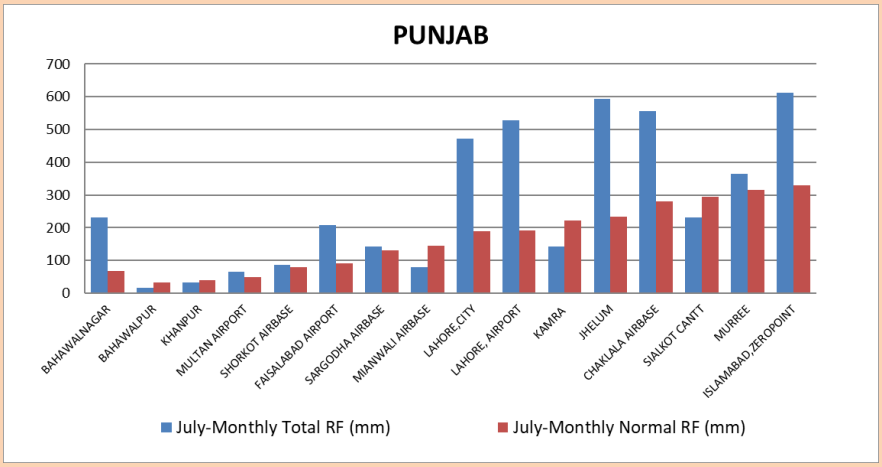


Figure 7c

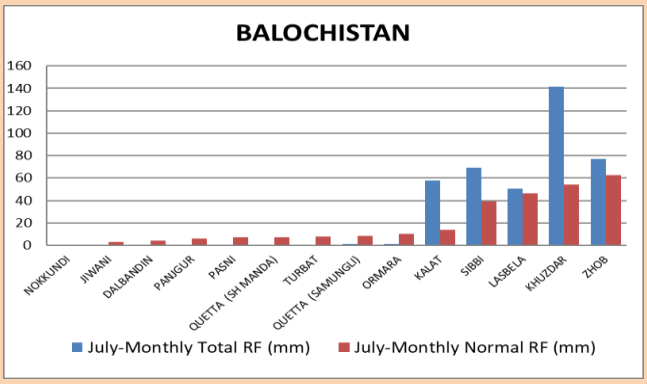


Figure 7d

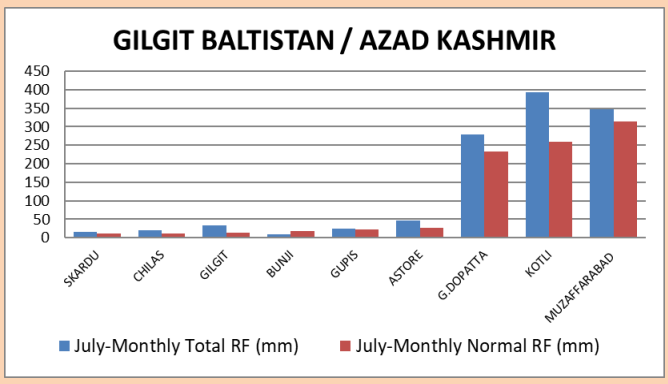


Figure 7e

3. Normalized Difference Vegetation Index (NDVI)

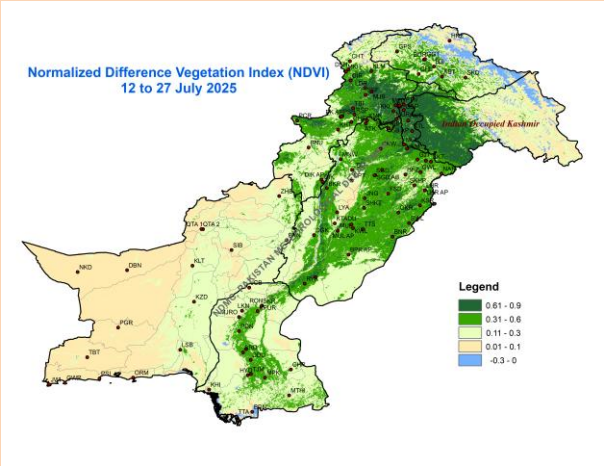


Figure 8: NDVI

Figure 8 displays the Normalized Difference Vegetation Index (NDVI) values observed between 12-27 July 2025. The analysis reveals high NDVI values in Kashmir, Punjab, Khyber Pakhtunkhwa, and along the Indus basin in Sindh, reflecting robust vegetation activity in these regions. These favorable conditions promote chlorophyll accumulation in plants, supporting enhanced vegetation cover. In contrast, persistently low rainfall has led to deficient NDVI values across most of Balochistan.

4. Land Surface Temperature (LST)

Figure 9 illustrates Land Surface Temperature (LST) patterns observed from 12-19 July 2025. The data reveals elevated daytime temperatures across southern Punjab, upper Sindh, and western Balochistan, with values ranging between 30°C and 50°C.

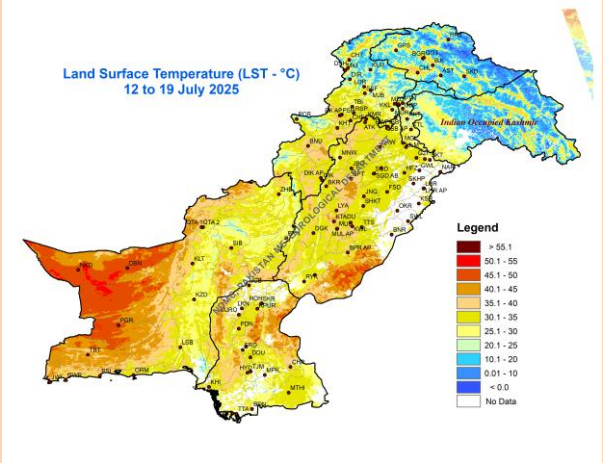


Figure 9: Land Surface Temperature (°C)

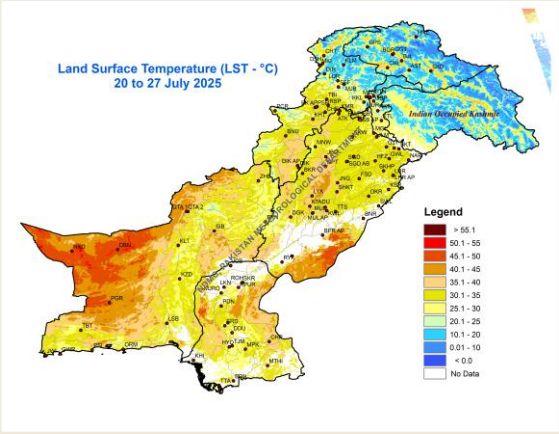


Figure 10: Land Surface Temperature (°C)

Figure 10 presents Land Surface Temperature (LST) measurements from 20-27 July 2025. The data shows consistent temperature patterns compared to the previous week, with western Balochistan, upper Sindh, and southern Punjab maintaining similar thermal conditions.

5. Temperature Vegetation Dryness Index (TVDI)

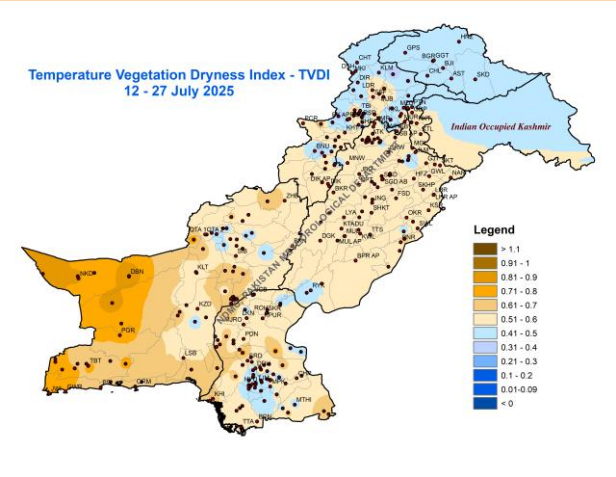


Figure 11: TVDI

Figure 11 presents the Temperature Vegetation Dryness Index (TVDI), derived from MODIS products (MOD13A2 for NDVI and MOD11A2 for LST). The TVDI analysis reveals moderate dry conditions across Balochistan, particularly pronounced in western regions. These patterns indicate persistent aridity and soil moisture deficits in the area.

6. Consecutive Dry Days (CDD) Duration up to 31st July 2025

Figure 12 displays the maximum duration of consecutive dry days (CDD) recorded up to July 2025. The analysis reveals extreme dry conditions persisting for 359 days in Turbat and 333 days in Pasni, establishing these locations as drought epicenters. While these western regions continue to experience severe aridity, substantial precipitation events have effectively reduced CDD accumulation across most other regions of the country.

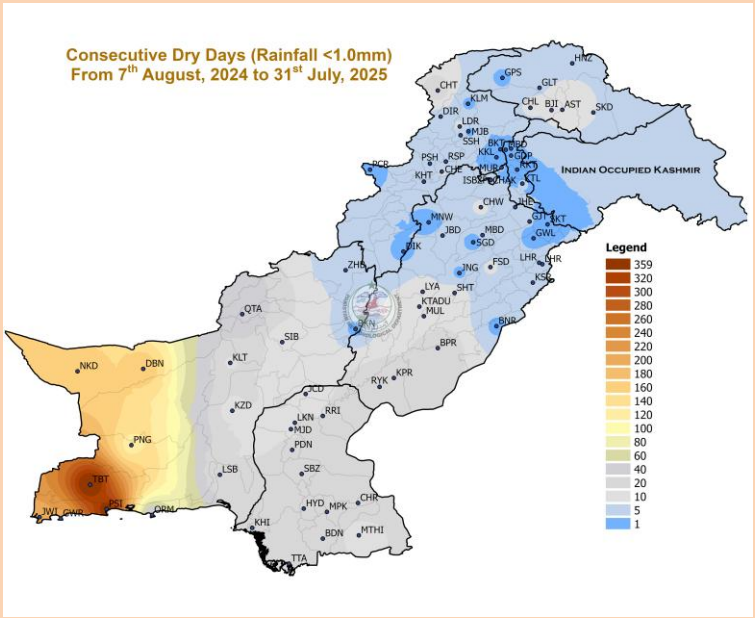


Figure 12: Duration of Consecutive Dry Days (CDD)

7. Drought Monitor for the Month of July, 2025

Based on the integration of multiple drought indices and ground station observations, Figure 13 presents the current spatial drought distribution across the country. Western Balochistan remains the most severely affected region, with Turbat experiencing extreme drought conditions due to prolonged dry spells exceeding 350 consecutive dry days (CDD), while other parts of western Balochistan show moderate drought severity. In contrast, the situation has significantly improved across Sindh and Punjab (both southern and upper regions) following substantial monsoon rainfall. The spatial pattern reveals a distinct west-to-east gradient of decreasing drought severity, directly corresponding to the distribution of seasonal precipitation. This improvement is particularly evident when comparing current conditions to pre-monsoon drought indices, demonstrating the critical role of monsoon systems in drought mitigation across the country's eastern agricultural zones.

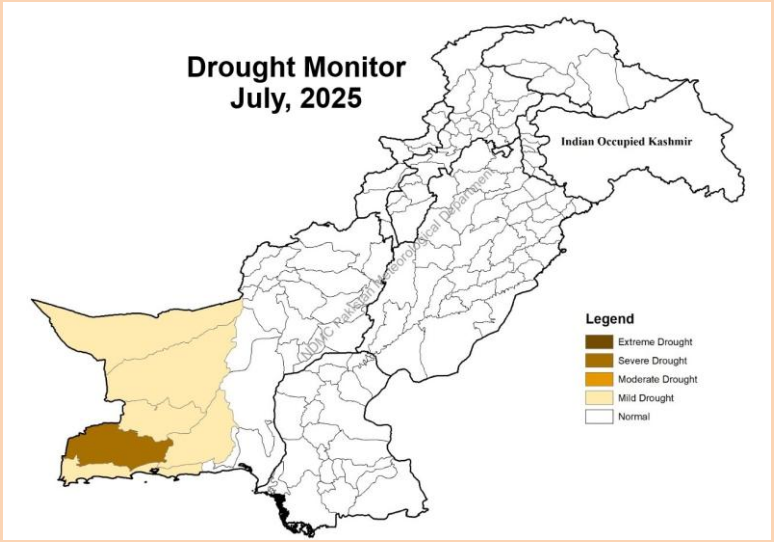
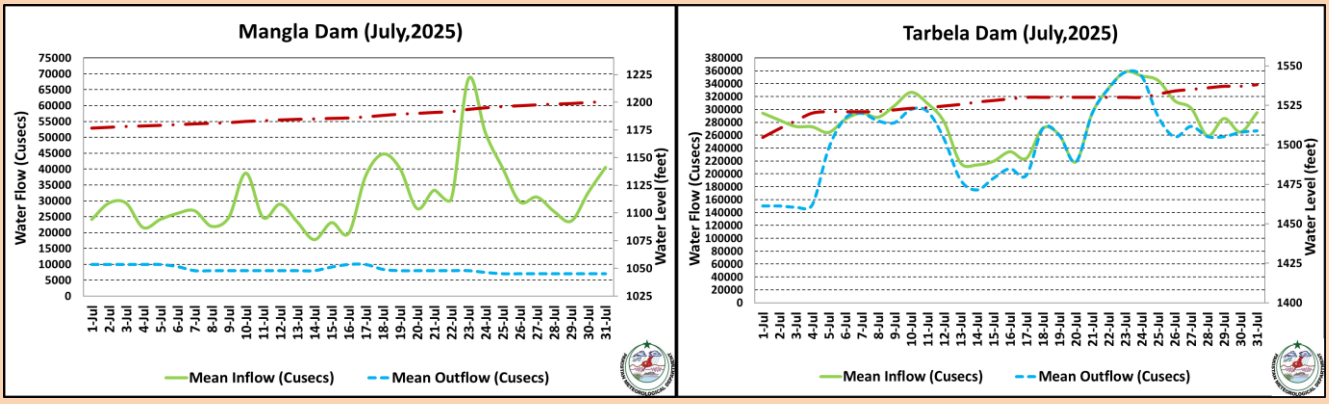


Figure 13: Drought Monitor of Pakistan for the month of July, 2025

8. Water availability/ Dams Flow Data:

Figure 14 presents the monthly water inflow, outflow, and storage levels for Pakistan's major reservoirs - Mangla, Tarbela, Khanpur, Rawal, and Simly. Both Mangla and Tarbela dams have shown significant water level increases, with Tarbela reaching 1,545 feet and Mangla at 1,204 feet,



attributable to combined effects of glacial melt and precipitation events. The smaller reservoirs (Khanpur, Rawal, and Simly) have similarly benefited from monsoon rainfall, demonstrating consistent water level rises. These improved storage levels reflect positive hydrological conditions during the reporting period, with Tarbela and Mangla showing particularly robust recovery compared to previous months. The data suggests favorable water availability for both agricultural and power generation needs in the coming weeks.

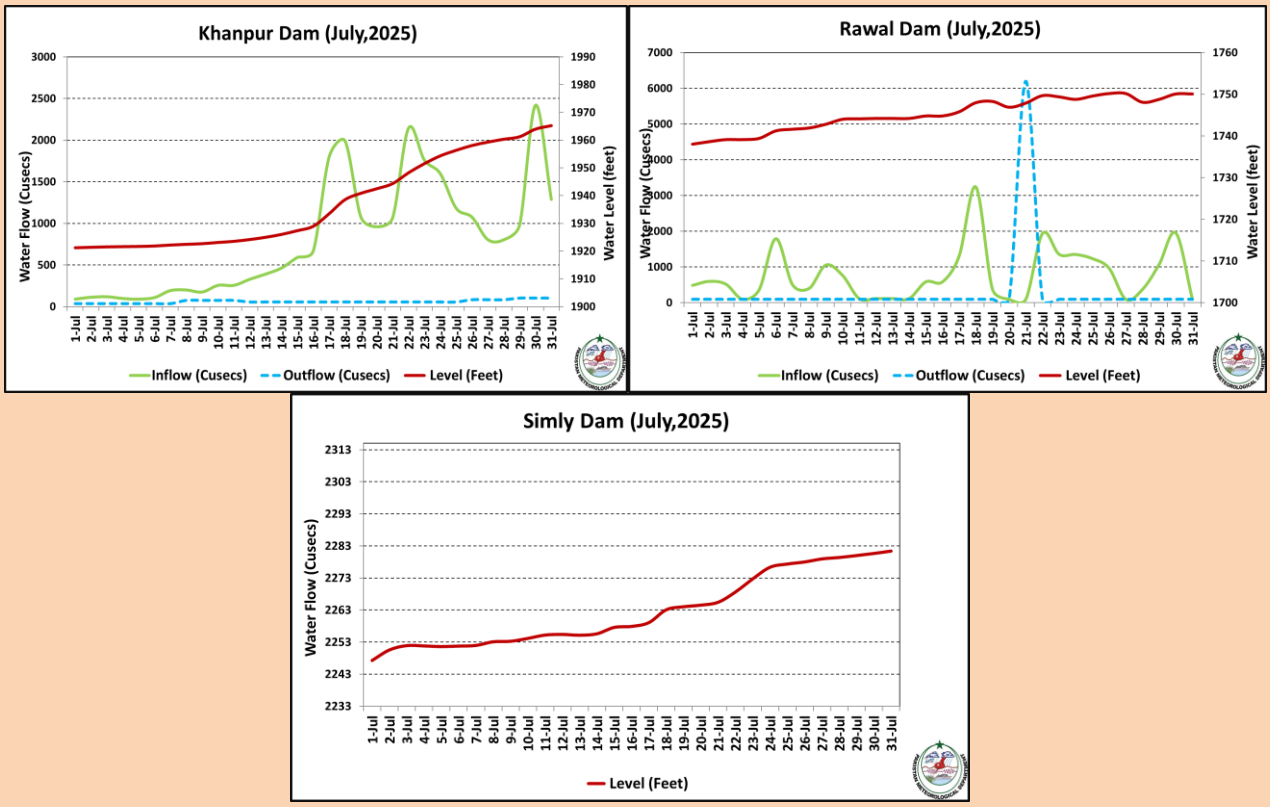


***Figure 14**: Water inflow, outflow and level of Rawal, Khanpur, Tarbela, Simly and Mangla Dams, July, 2025*

9. August 2025, Climate Outlook

The forecast for August 2025 predicts near-normal to above-normal rainfall across most parts of Pakistan, with northeastern Punjab, Kashmir, and southeastern Sindh expected to receive significantly above-normal precipitation. The rest of the country is likely to experience rainfall amounts within normal seasonal ranges. Temperature patterns are projected to show distinct regional variations, with above-normal mean temperatures anticipated in the mountainous northern and western regions, while the plains of Punjab and Sindh should maintain near-normal temperature ranges.

10. August 2025 Weather and Drought Outlook

The forecast for August predicts near-normal to above-normal rainfall across most parts of Pakistan. This is particularly favorable for Punjab and Sindh, where regions that faced drought conditions earlier in 2025 have already received beneficial monsoon rains. The expected continuation of these rainfall patterns should further improve the drought situation in these agriculturally vital areas during August.

In contrast, western Balochistan remains in a critical state due to an extended dry period lasting nearly one year. Forecast models indicate minimal prospects of significant rainfall in this region for the coming months, with only occasional, unpredictable weather systems potentially providing limited relief. The persistent drought conditions continue to pose serious challenges for water resources and agriculture in western Balochistan.

All citizens and concerned departments are advised to practice strict water conservation and adopt efficient water-use measures to mitigate drought impacts.

11. Crop Condition

- Recent rainfall has significantly enhanced soil moisture levels across Punjab and parts of Sindh, benefiting early Kharif crop growth and land preparation.
- With the wheat harvest completed, farmers are advised to utilize residual soil moisture and timely rainfall for land preparation and sowing of Kharif crops (e.g., rice, cotton, maize).
- Monsoon typically brings heavy rainfall, high humidity, and potential extreme precipitation events—particularly in sub-mountainous regions. Farmers should:
    - Ensure proper field drainage to prevent waterlogging.
    - Monitor weather updates to align irrigation and harvesting schedules.
- Given erratic rainfall distribution, judicious use of stored water resources is critical, especially in areas with limited irrigation access.
- Regularly check PMD forecasts for real-time updates on heavy rains, dry spells, or temperature fluctuations to mitigate risks to crops