

# Pakistan Meteorological Department



## Monthly Drought Bulletin For the Month of August 2024

### Highlights

- During the month of August 2024, heavy to very heavy rainfall/ shower events were reported across the country. However, few isolated places like Nokundi in Balochistan, Kohat, Dir, Chitral, Saidu Sharif in KP Sialkot in Punjab, and some parts of AJK received below normal rainfall.
- Mean monthly temperatures were recorded -1 to -1.5°C below-normal in most parts of the country. The mean monthly temperature anomalies were in the range of -1.5 to 2.5°C in the country during the month of August 2024.
- During September 2024, Monsoon rains will continue which may help to improve the soil moisture, and may impact positively on agriculture, livestock and regional ecosystem in the country.
- Daytime maximum temperatures are expected to remain normal to below normal over most of the country. However, northern parts of the country (Upper Khyber Pakhtunkhwa, Gilgit-Baltistan and Kashmir), may experience warmer than normal temperatures.
- Heavy to very heavy rains in Sindh, Punjab, North Baluchistan have improved the moisture conditions in these stress areas, while western areas of Balochistan are still under moisture stress due to deficient rainfall. Keeping in view the weather forecast for the month of September 2024, disaster management authorities may be requested to plan DRM activities accordingly.

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# 1. Weather Summary for the month of August, 2024

During August 2024, heavy to very heavy rainfall received across the country. The spatial distribution of rainfall is shown in Figure 1. The highest amounts of monthly rainfall recorded across Pakistan during August 2024 are shown in Table1 below,

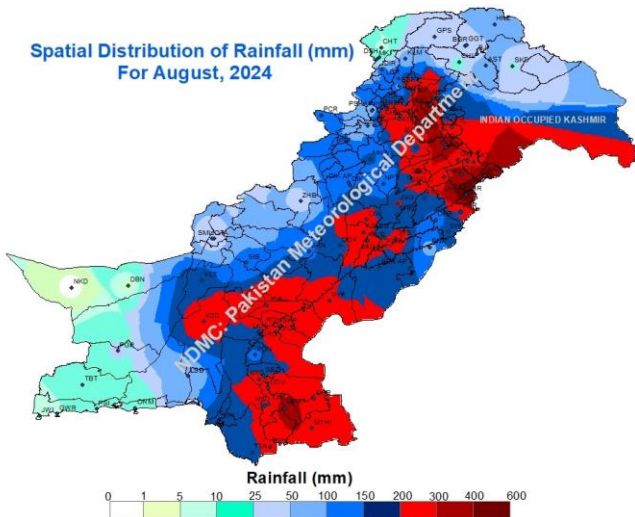


Figure 1: Spatial Distribution of rainfall

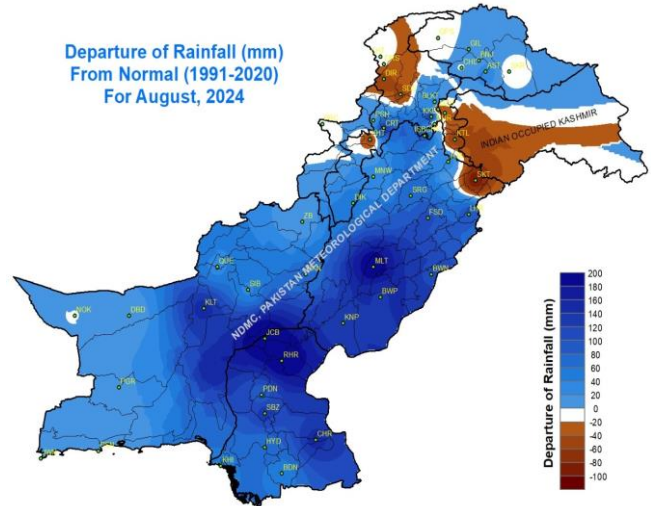
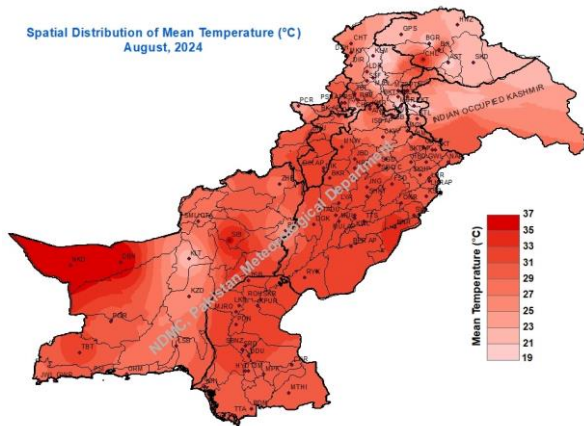


Figure 2: Departure of rainfall from Normal

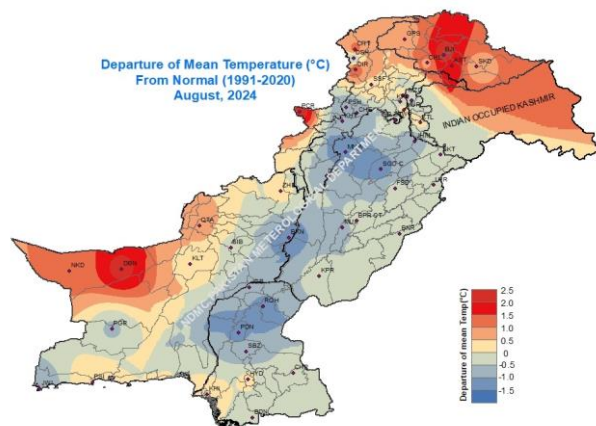
Figure 2 depicts the departure of rainfall from the normal(1991-2020). Above-normal rainfall was recorded across the country except few isolated places like Nokundi in Balochistan, Kohat, Dir, Chitral, Saidu Sharif in KP, Sialkot in Punjab, and some parts of AJK receive below than normal rainfall.

Sr. No.	Station	Rainfall(mm)	Sr No.	Station	Rainfall(mm)
1	LAHORE, AIRPORT	603	11	MANGLA	320
2	KAKUL	461	12	KHAIRPUR	303
3	NAROWAL	437	13	MITHI	297
4	ISLAMABAD, ZEROPOINT	424	14	SIALKOT AIRPORT	284
5	MIRPUR KHAS	385	15	JACOBABAD	281
6	CHAKLALA AIRBASE	359	16	MULTAN AIRPORT	276
7	JHELUM	357	17	HAFIZABAD	274
8	GUJRANWALA	354	18	MURREE	264
9	BALAKOT	351	19	MUZAFFARABAD AIRPORT	259
10	MANDIBAHAUDDIN	321	20	RAHIM YAR KHAN	258

Spatial distribution of mean temperature recorded at PMD stations for the month of August 2024 is shown in figure 3. During the month, southern parts of the country experienced the mean maximum temperature up to 37°C.



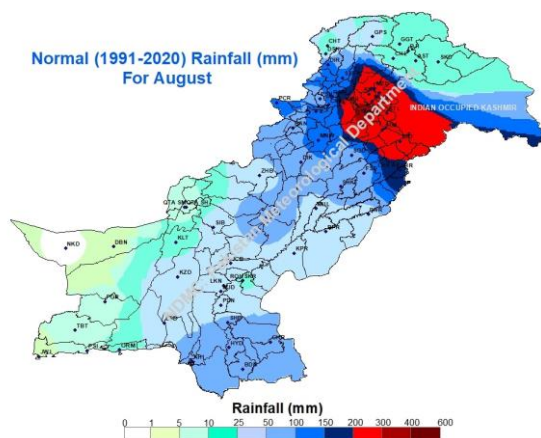
**Figure 3:** Monthly Mean Temperature (°C)



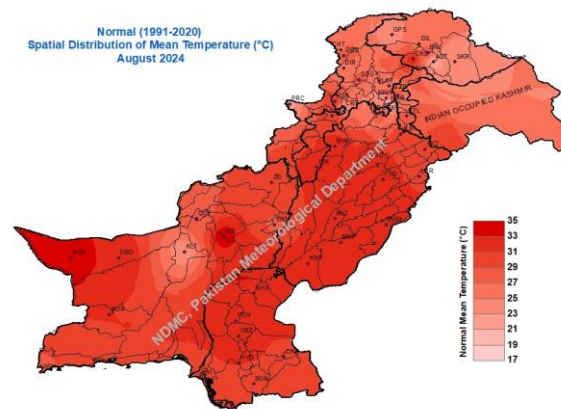
**Figure 4:** Monthly Departure from Normal

Departure of mean temperature from the normal (1991-2020) is shown in figure 4, which show normal to below-normal mean temperatures across most part of the country.

Monthly Normal (1991-2020) rainfall for the month of August and Monthly Normal mean temperature(°C) for the month of August are shown in the figures 5 and 6 respectively.



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



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

## 2. Comparison of actual to Normal Monthly Rainfall for August-2024

The comparison of actual to Normal rainfall (1991-2020) for month of August 2024 are shown in figure 7 (a) for Khyber Pakhtunkhwa, Gilgit Baltistan and Azad Jammu & Kashmir in figure 7 (b), Punjab in figure 7 (c), Balochistan in figure 7 (d), and Sindh in figure 7 (e).

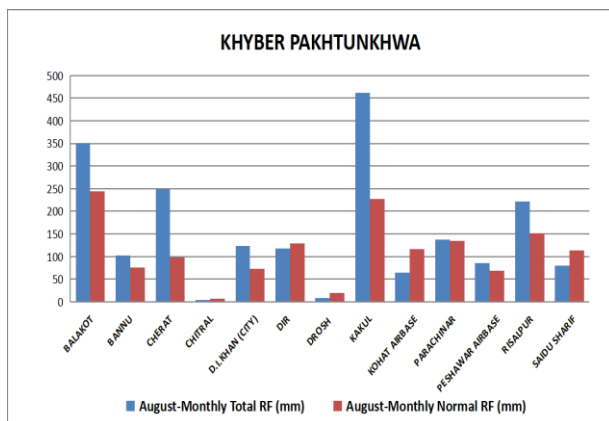


Figure 7a

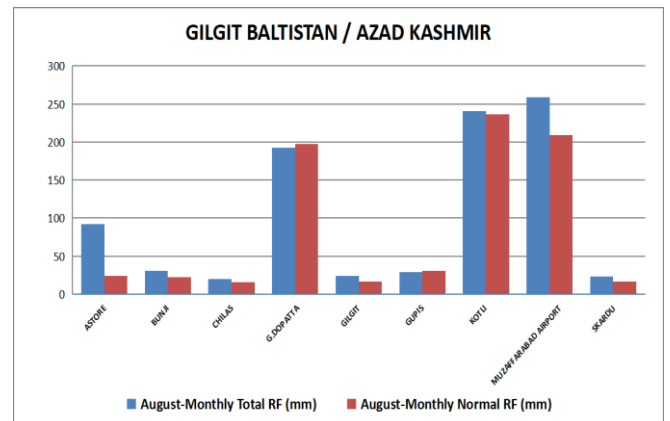


Figure 7b

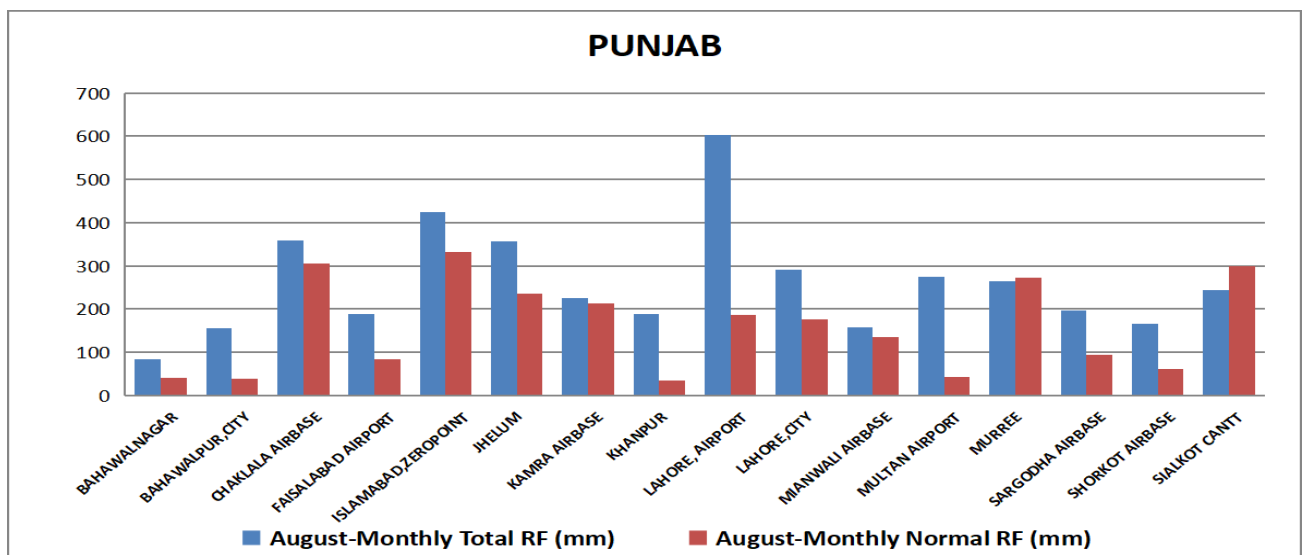


Figure 7c

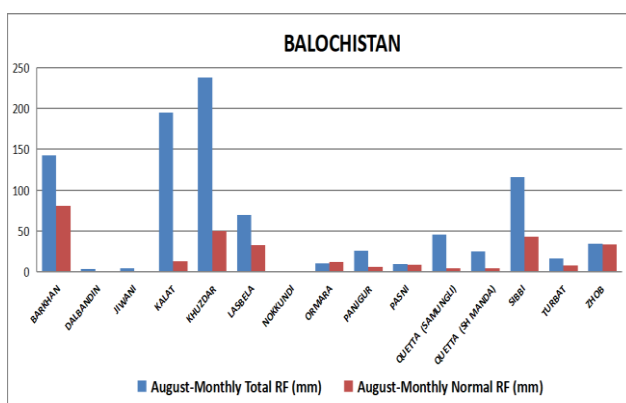


Figure 7d

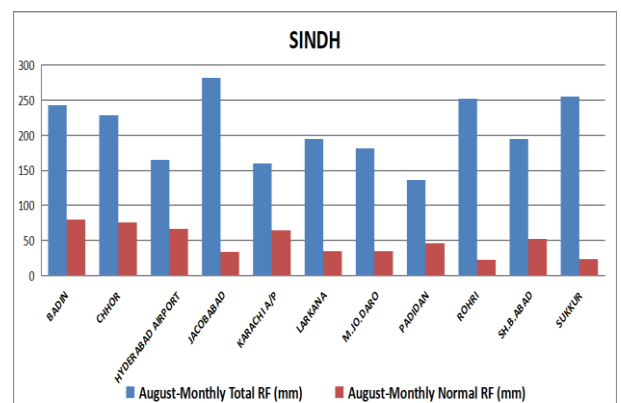


Figure 7e

### 3. Normalized Difference Vegetation Index (NDVI)

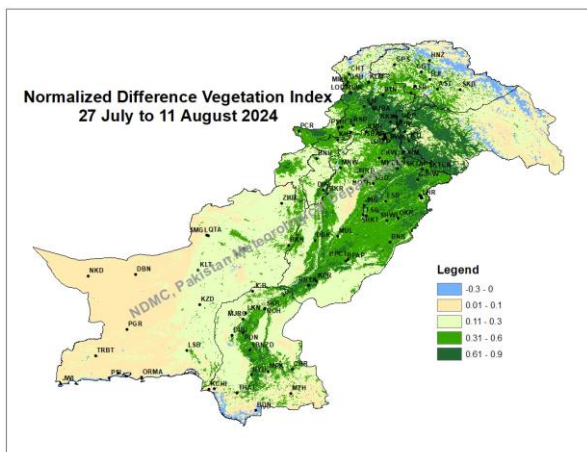


Figure 8: NDVI

Normalized Difference Vegetation Index values for August 2024 are shown in Fig.8. NDVI conditions are high in AJK, Punjab, Khyber Pakhtunkhwa, and along the Indus belt, depicting the widespread vegetation in fields. Such condition nourish the chlorophyll content stored in the plants and enhance the vegetation cover over the fields.

### 4. Land Surface Temperature (LST)

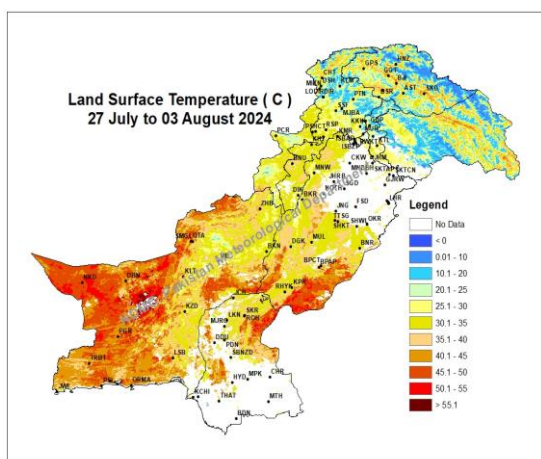


Figure 9: LST (°C)

Land Surface Temperatures (LST) for the period 27 July– 03 August 2024 are represented in Fig 9. The central parts of the country observed the average daytime temperatures between 25- 30°C, while in south western parts of Balochistan, the temperature was recorded between 40- 50°C during the period.

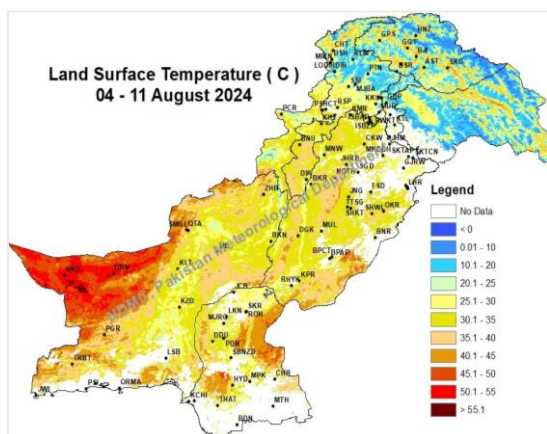


Figure 10: LST (°C)

Land Surface Temperatures during the period 4 – 11 August are shown in Fig. 10. Most of the areas experience decrease in temperatures due to the weather system while few parts of Balochista observed increase in temperature as compared to the preceeding week.

## 5. Temperature Vegetation Dryness Index (TVDI)

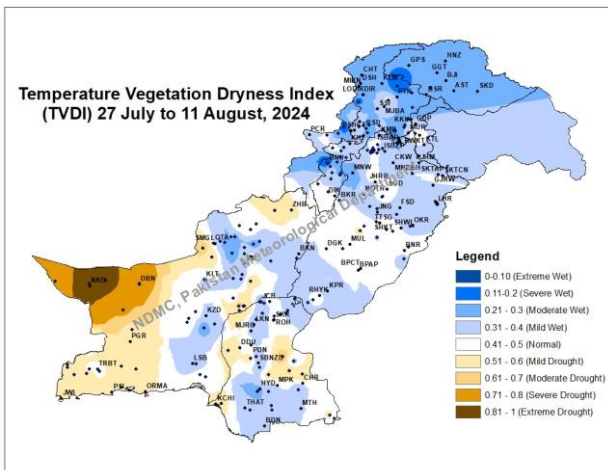


Figure 11: TVDI

Temperature Vegetation Dryness Index (TVDI) derived from MODIS data sets MOD13A2 (NDVI) and MOD11A2 (LST) is shown in Fig. 11, which indicates mild dry like conditions in the South west Balochistan as highlighted by the TVDI Index. It indicates the start of dryness and deficient soil moisture conditions in the western parts and coastal areas of Balochistan.

## 6. Length of Consecutive Dry Days:

The maximum length of consecutive dry days is shown in figure 12. Number of consecutive dry days has increased from 21 to 110 days across western and south western Balochistan, while rest of the country received sufficient spells of rainfall.

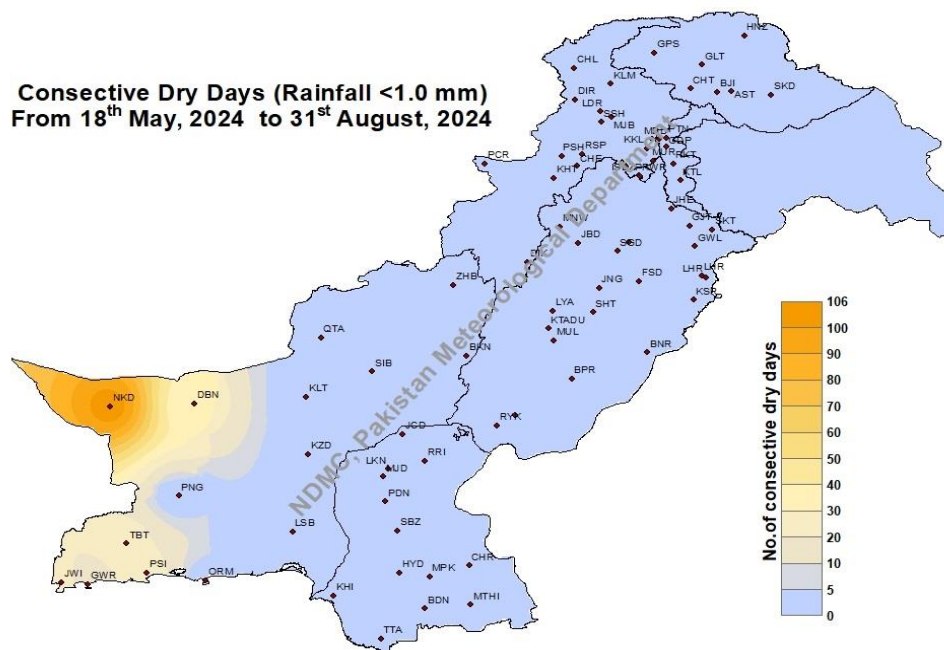


Figure 12: No. of consecutive dry days

## 7. Drought Monitor for the month of August 2024

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.

Nokundi Dalbandin, Turbat, Jiwani, Gwadar and Ormara in the Balochistan province are under moisture stress due to less rains during past three months.

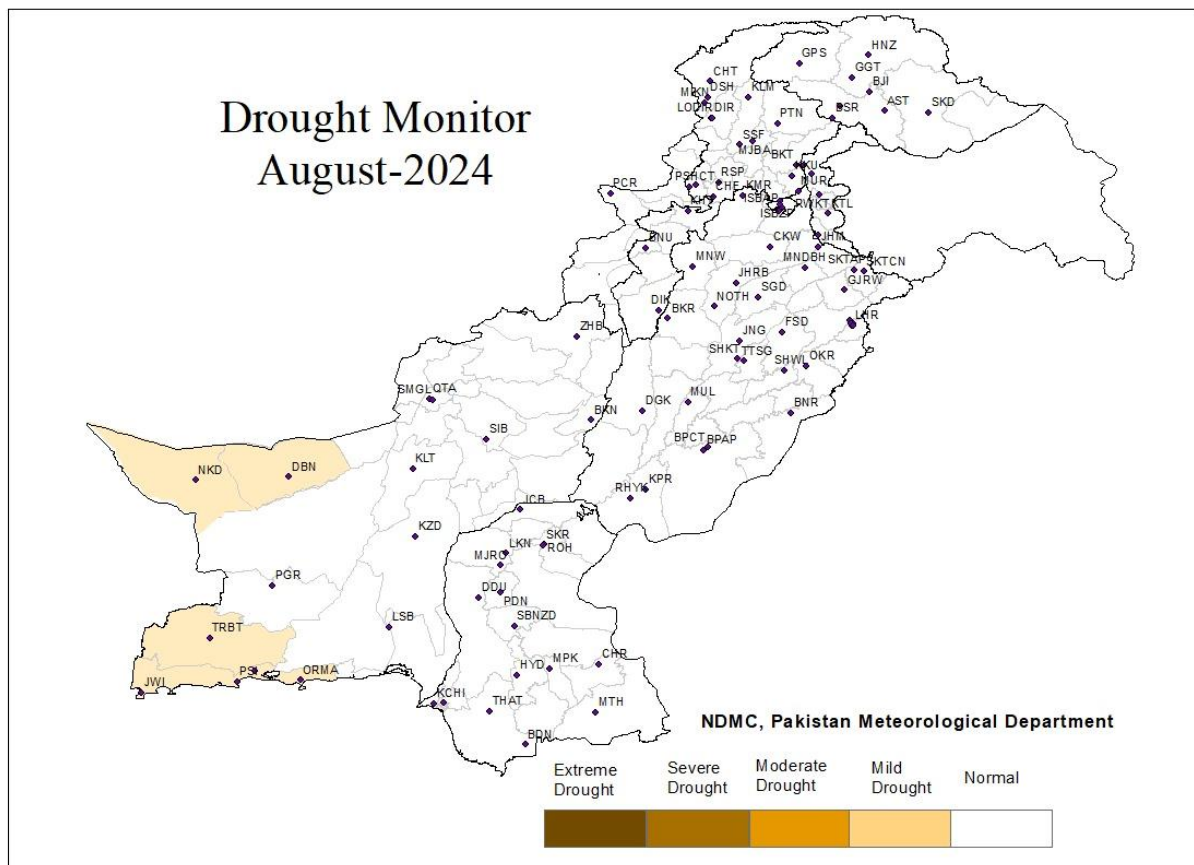
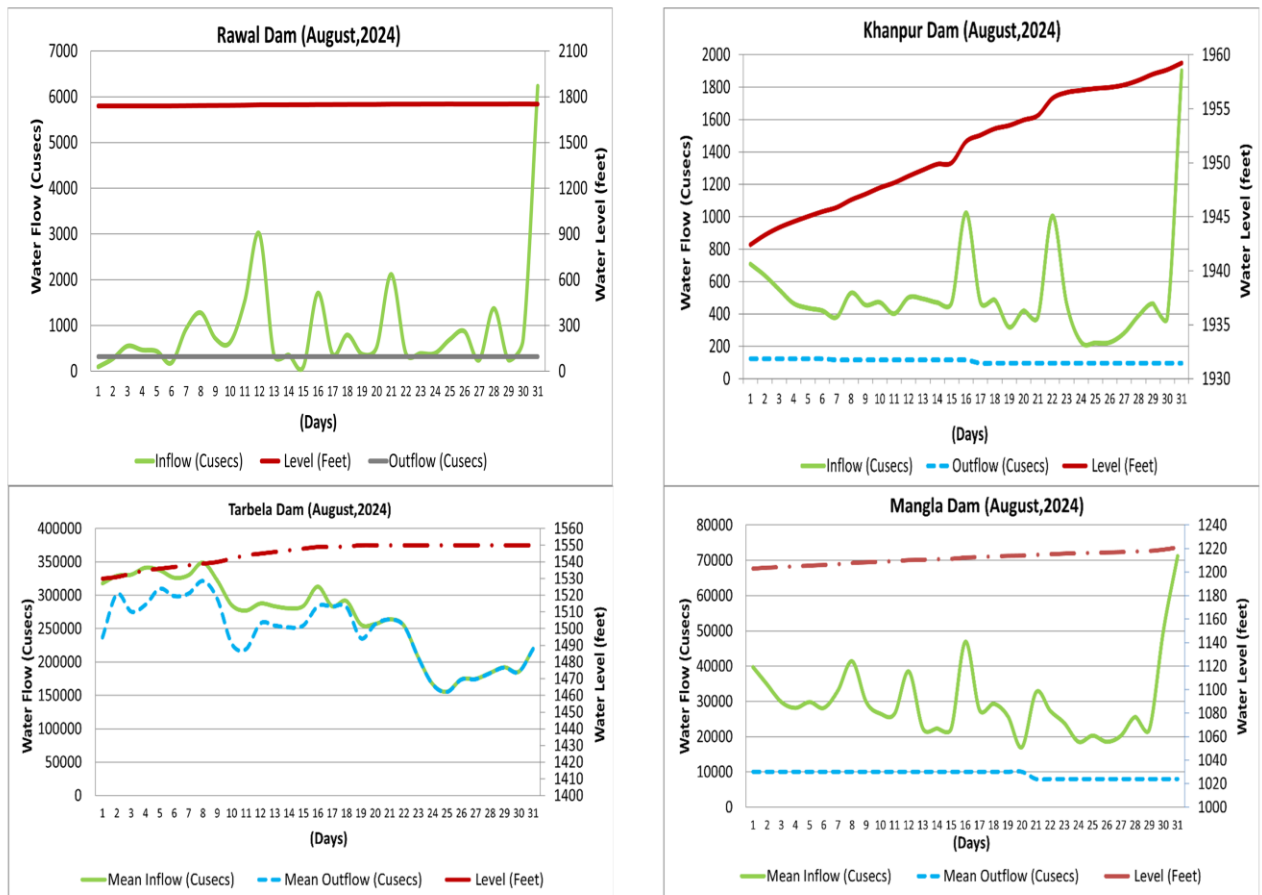


Figure 13: Drought Monitor of Pakistan for the month of August 2024



## 8. Water availability/ Dams flow data:

During the month of August 2024, water inflow, outflow and levels of the Rawal, Khanpur, Tarbela and Mangla dams are shown in Figure.14. The water level at Terbela, Rawal and Mangla reservoirs has reached to its maximum, while Khanpur dam is still under the limit.



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

## 9. Weather Outlook for September 2024

Overall a tendency for near normal rainfall is expected in most parts of the country. However, Northeastern Punjab and Southeastern Sindh may get slightly above normal rainfall during September 2024. In contrast, Northern Khyber Pakhtunkhwa, Kashmir and Gilgit-Baltistan may receive normal to below normal rainfall. Daytime maximum temperatures are expected to remain normal to below normal over most of the country, however, northern parts (Upper Khyber Pakhtunkhwa, Gilgit-Baltistan and Kashmir), will remain warmer than normal. Concurrently, warmer than normal minimum temperatures are expected nationwide with maximum departure over Gilgit-Baltistan and southwestern Balochistan.

## 10. Drought Outlook for September 2024

Keeping in view the forecast for September 2024, few monsoon spells may affect south eastern and north eastern parts of the country, during first fortnight of the month. Drought conditions are less likely to develop in all parts of the country except western parts of Balochistan province.

**All stakeholders across the country are advised to make efforts to save and judicious use of the available water so that the stored water may be utilized in the upcoming months of deficient rainfalls.**

## 11. Crop Condition:

The Kharif crops are usually sown at the beginning of the first rains during the advent of the southwest monsoon season. They are harvested at the end of the monsoon season (October). Due to satisfactory monsoon rains reported in most of the parts of the country, soil moisture conditions are satisfactory to meet the requirements of most of standing seasonal crops like cotton, peanut, sugarcane, seasonal vegetables, and orchard.

## 12. Advice for Farmers:

- I. Pest/viral attacks and more weed growth are expected after recent rains on sugarcane crop. Farmers are therefore advised to take precautionary measures in time.
- II. Farmers of upper half and northeast Balochistan may remain careful in irrigation and spraying chemicals on the crops before or during the expected rainfalls in this period.
- III. Due to satisfactory rainfall reported in the country, soil moisture conditions are satisfactory to flourish most of the standing seasonal crops like cotton, peanut, sugarcane, seasonal vegetables, and orchards.

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