

Pakistan Meteorological Department



Monthly Drought Bulletin For the Month of October 2024

Highlights

- During the month of October 2024, light to moderate rainfall events were reported across most parts of the country. However, south Punjab, north Sindh and western Balochistan received no rainfall.
- Mean monthly temperatures were recorded 1°C to 4°C above-normal across the country except Gilgit where temperature was recorded below normal.
- During the month of November 2024, normal to slightly below normal rainfall is expected in western and upper parts of the country i.e., Khyber Pakhtunkhwa, Gilgit-Baltistan and Balochistan along with upper Punjab and adjoining Kashmir. However, there are chances of near normal rainfall in Sindh, Balochistan, and southern Punjab.
- Temperatures are expected to remain above normal nationwide. The southwestern parts of Balochistan, upper Khyber Pakhtunkhwa and Gilgit-Baltistan are expected to experience above-normal temperatures. While the Sindh, Punjab and Eastern Balochistan temperatures may be near normal during the forecast month.
- Below normal rains during November 2024 will further decrease soil moisture level over drought prone areas of the country.
- Keeping in view the weather forecast for the month of November 2024, disaster management authorities are requested to plan DRM activities accordingly.

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1. Monthly Rainfall and Temperature Analysis for the Month of October, 2024

During the month of October 2024, light to moderate rainfall received across the country. The spatial distribution of rainfall is shown in Figure 1. Chief amounts of rainfall was recorded across Kashmir and Khyber Pakhtunkhwa (KP). The highest amounts of monthly rainfall are shown in Table1.

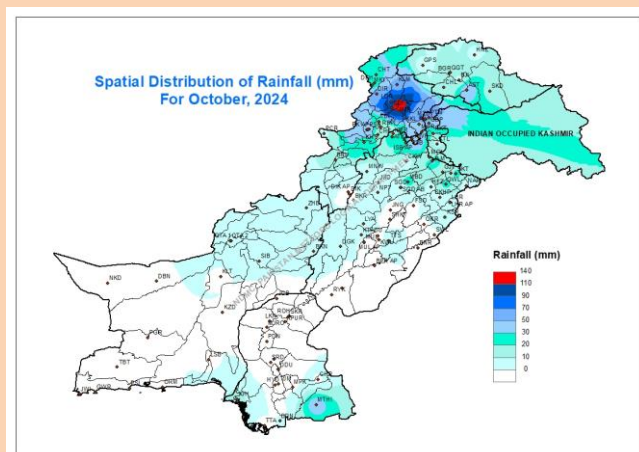


Figure 1: Spatial Distribution of rainfall

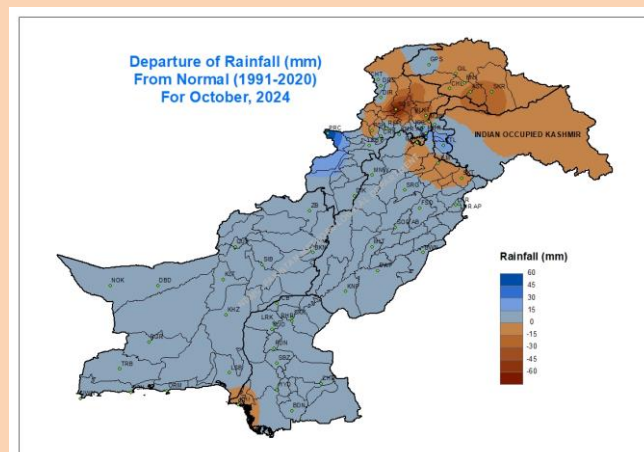


Figure 2: Departure of rainfall from Normal

Figure 2 depicts the departure of rainfall from the normal (1991-2020). Apparently normal to slightly above rainfall was recorded across most part of the country except Potohar region, upper KP , Gilgit Baltistan and Karachi in Sindh where below normal rainfall is reported.

Sr.No.	Station	Rainfall(mm)	Sr.No.	Station	Rainfall(mm)
1	Saidu Sharif	109	11	Drosh	27.4
2	Balakot	79	12	Kakul	26.2
3	Dir	66.5	13	Chitral	23.7
4	Muzaffarabad Airport	60.71	14	Sialkot Cantt	23
5	Chaklala Airbase	50	15	Kohat Airbase	22
6	Astore	44.4	16	G.Dopatta	20.4
7	Peshawar Airbase	40.7	17	Skardu	17.8
8	Islamabad (Zeropoint)	36.5	18	Bannu	15
9	Jhelum	35	19	Karachi (A/P)	12
10	Murree	32	20	Kamra Airbase	11.2

Spatial distribution of mean temperature recorded at PMD stations for the month of October 2024 is shown in Figure 3. During the month central, southern Punjab, Sindh, ,western Balochistan experienced the mean temperature up to 31°C.

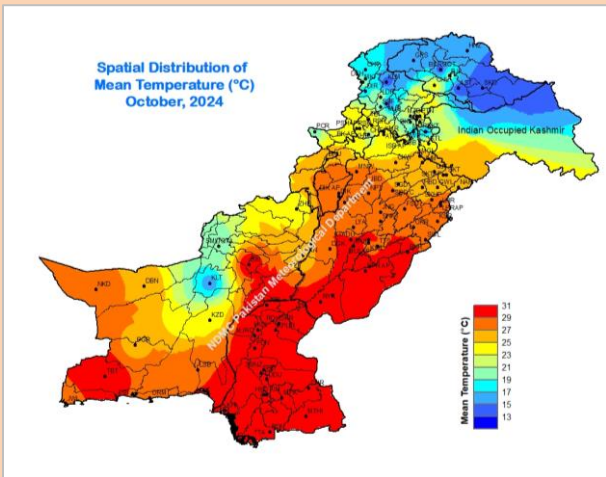


Figure 3: Monthly Mean Temperature (°C)

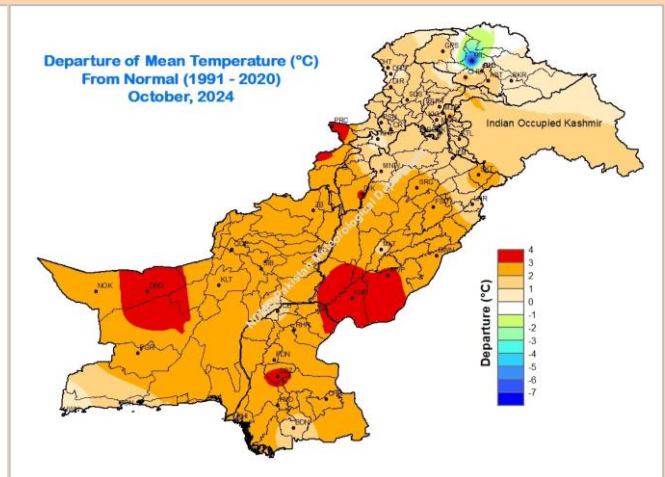


Figure 4: Monthly Departure from Normal

Departure of mean temperature from the normal (1991-2020) is shown in Figure 4, which show above-normal mean temperatures across most part of the country except Gilgit where temperature was recorded below normal.

Monthly normal (1991-2020) rainfall and monthly normal mean temperature(°C) for the month of October are shown in the Figures 5 and 6 respectively.

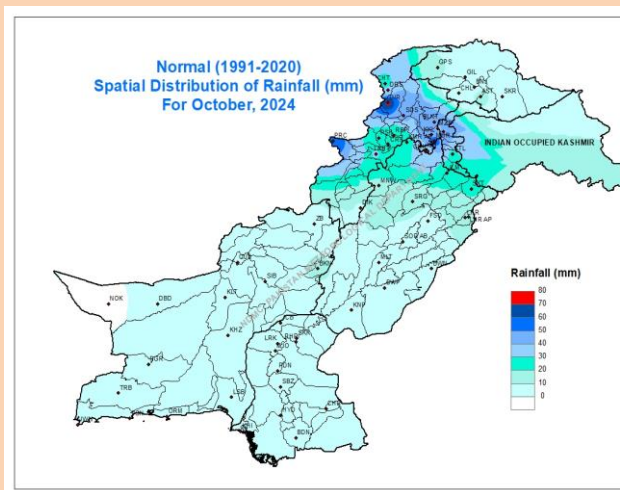


Figure 5: Monthly Normal Rainfall (mm)

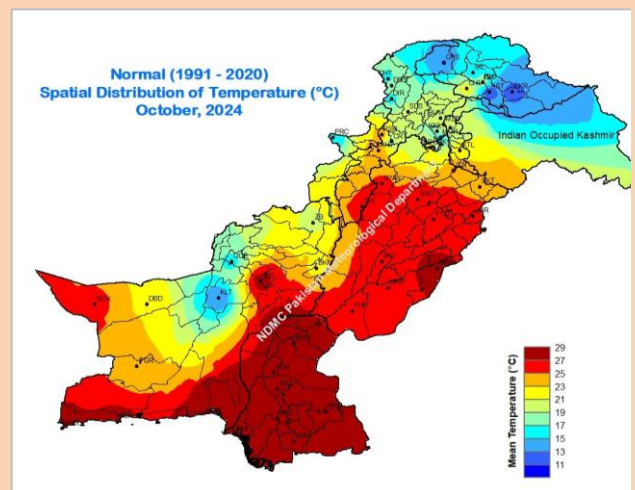


Figure 6: Monthly Mean Temperature (°C)

2. Comparison of Actual to Normal Monthly Rainfall for October

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

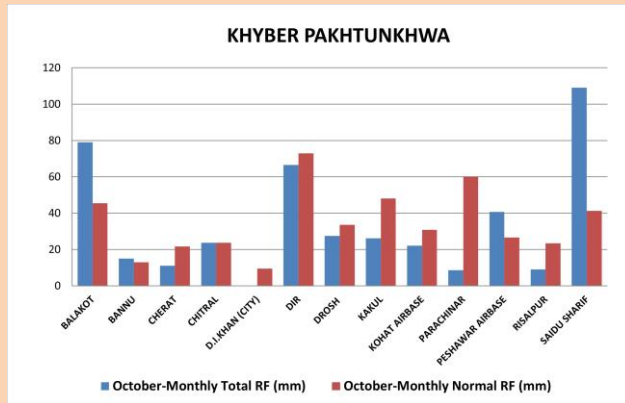


Figure 7a

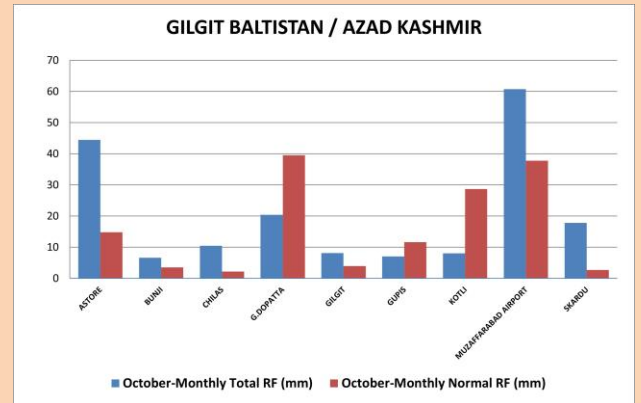


Figure 7b

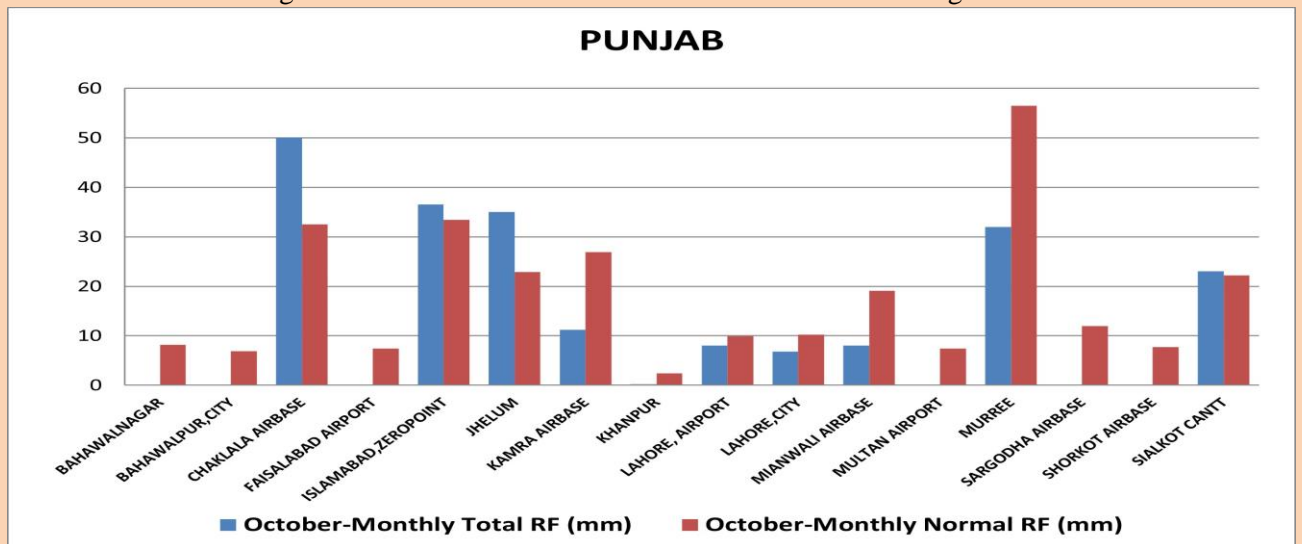


Figure 7c

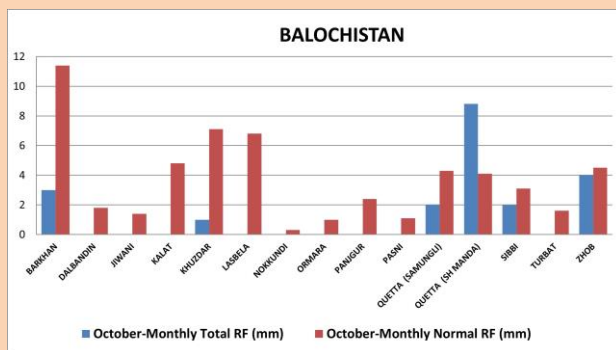


Figure 7d

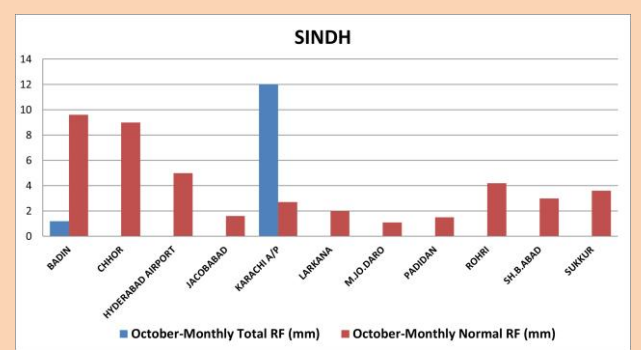


Figure 7e

3. Normalized Difference Vegetation Index (NDVI)

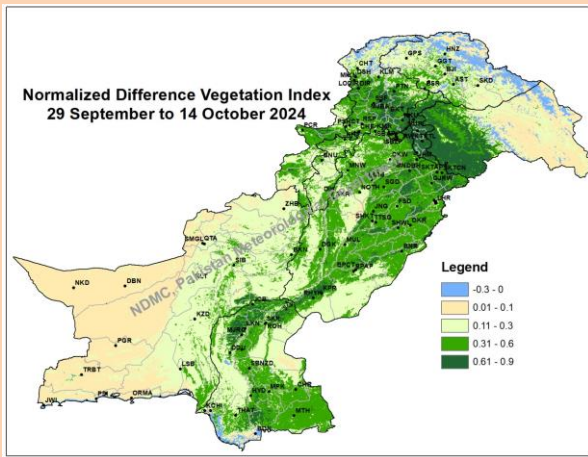


Figure 8: NDVI

Normalized Difference Vegetation Index values for October 2024 are shown in Fig.8. NDVI conditions are high in AJK, Punjab, Khyber Pakhtunkhwa, and along the Indus belt, depicting the wide spread 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)

Land Surface Temperatures (LST) for the period 29 September to 06 October 2024 are represented in Figure 9. The central parts of the country (South Punjab, Northeastern Sindh) observed the average daytime temperatures between 30-35°C, while in western parts of Balochistan, the temperature was recorded above 35°C during the period.

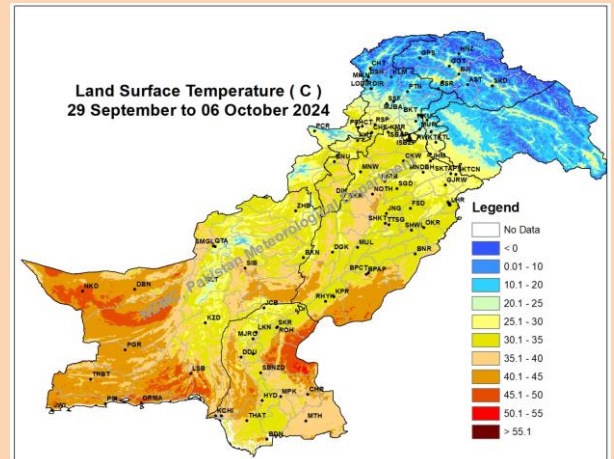


Figure 9: LST (°C)

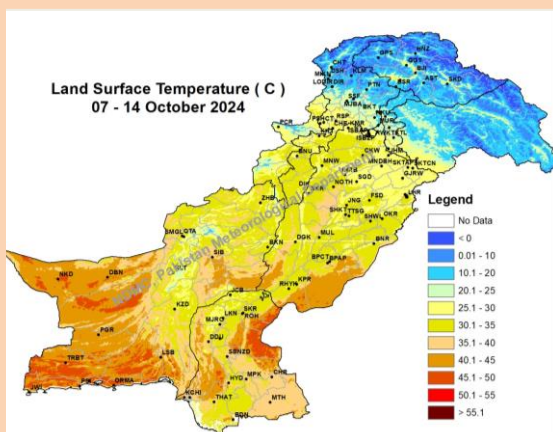


Figure 10: LST (°C)

Land Surface Temperatures during the period 7-14 October are shown in Figure 10. The country experience decrease in temperature due to prevailing of dry continental winds. Days are also getting shorter as compared to nights due to which duration of less sun shine hours are available

5. Temperature Vegetation Dryness Index (TVDI)

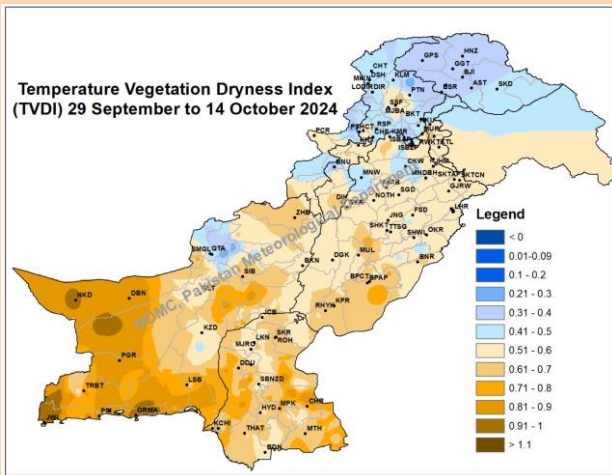


Figure 11: TVDI

Temperature Vegetation Dryness Index (TVDI) derived from MODIS data sets MOD13A2 (NDVI) and MOD11A2 (LST) is shown in Figure 11, which indicates moderate dry like conditions in the west Balochistan (Nokundi, Dalbandin) 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. Maximum Length of Consecutive Dry Days:

The maximum length of consecutive dry days (CDD) is shown in Figure 12. Number of consecutive dry days has increased from 41 to 180 days across western Balochistan (Nokundi, Dalbandin), while Punjab, Sindh (except Badin and Chorr) and northern Balochistan experienced 20 to 40 dry days.

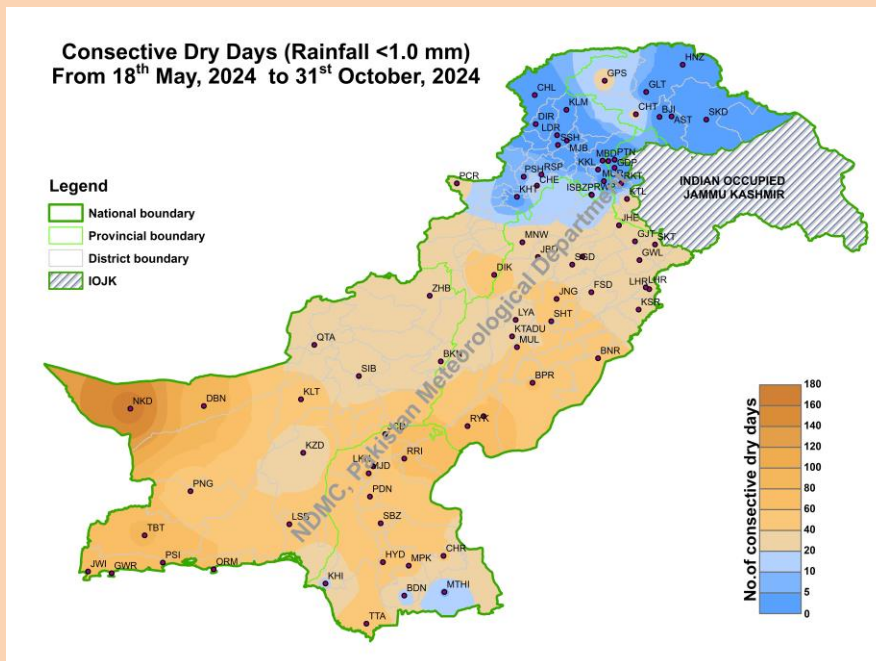


Figure 12: No. of consecutive dry days

7. Drought Monitor for the Month of October 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, Jiwani, Gwadar, Turbat, Pasni and Ormara in the Balochistan province are under moisture stress due to less rains during past three months.

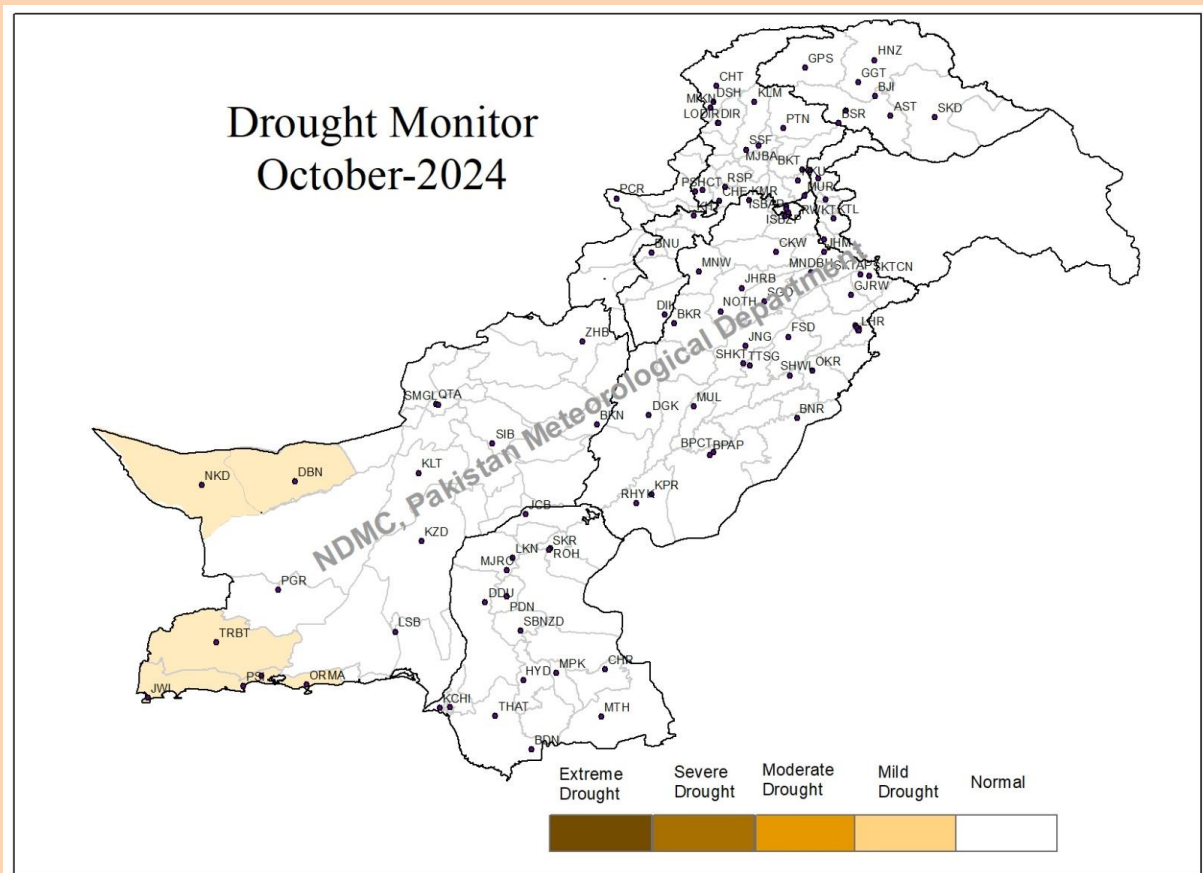


Figure 13: Drought Monitor of Pakistan for the month of October 2024

8. Water availability/ Dams flow data:

During the month of October 2024, water inflow, outflow and levels of the Rawal, Khanpur, Tarbela and Mangla dams are shown in Figure 14. The water level at Mangla and Tarbela reservoirs has started to decrease due to less amount of rainfall received during the month. However, the water level in small reservoirs remained unchanged.

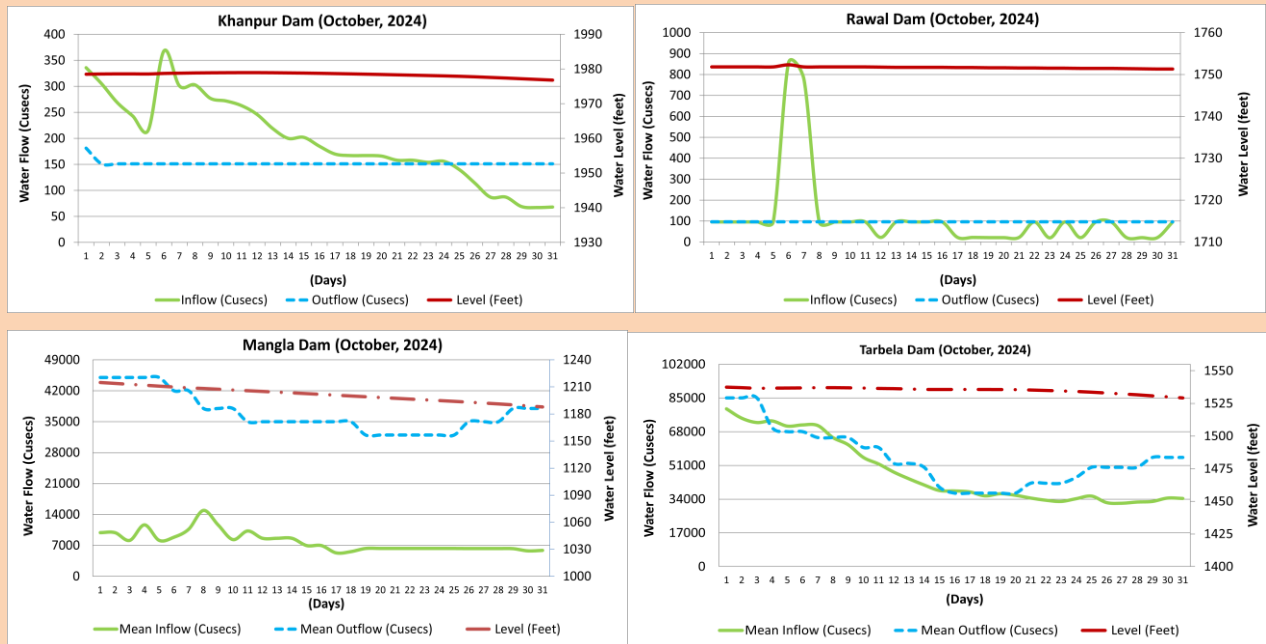


Figure 14: Water inflow, outflow and level of Rawal, Khanpur, Tarbela and Mangla Dams

9. Weather Outlook for November 2024

During the month of November 2024, normal to slightly below normal rainfall is expected in western and upper parts of the country i.e., Khyber Pakhtunkhwa, Gilgit-Baltistan and Balochistan along with upper Punjab and adjoining Kashmir. However, there are chances of near normal rainfall in south Punjab, Sindh and Balochistan.

Temperatures are expected to remain above normal nationwide. The southwestern parts of Balochistan, upper Khyber Pakhtunkhwa and Gilgit-Baltistan are expected to experience above-normal temperatures. While the Sindh, Punjab and Eastern Balochistan temperatures may be near normal during the forecast month.

10. Drought Outlook for November 2024

Keeping in view the forecast for November 2024, below normal rainfall is expected which will further decrease the soil moisture in the drought prone areas (western Balochistan, Thar desert of Sindh and Thal desert in Punjab) of the country. Drought conditions are likely to develop in some parts of the country specially in western and southern 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

Harvesting of Kharif crops like Maize, Mung bean, sugarcane, Peanut, Sunflower, Soybean, rice, cotton is almost finished. Farmers are advised to prepare the land for Rabi crops on priority and start sowing in time. No serious pest / insect attack has been reported so far.

12. Advice for Farmers

- Reasonable soil moisture is available for sowing of upcoming Rabi crops due to above normal rains during monsoon season, except September during which below normal rains recorded.
- Soil moisture stress is also expected during November due to below normal precipitation expected during the month.
- In addition to a gradual fall in temperature during the next month, slightly below normal rainfall (snowfall on hills) is expected in most parts of the country, especially in the northern regions.
- Considerable amount of water would be available for irrigation particularly over the upper half, during the forecast period.
- However, judicious use of available water stock is recommended for the lower half of the country.

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