

# Monthly Drought Bulletin For the Month of August 2023

## Highlights

- During the month of August 2023, Light to moderate rainfall events in northern parts of the country where as most of the areas in Balochistan and Sindh received no rainfall during the month.
- August 2023 was the 2nd driest month in Pakistan in the last 63 years as -65.9% below normal rainfall was recorded in the country.
- Overall a tendency for near normal rainfall is expected in most parts of the country. Thunderstorms with isolated heavy falls are expected during the forecast month. Temperatures are forecasted to remain slightly above normal nationwide.
- Due to the below-normal rainfall (August 2023), **abnormally dry conditions (mild drought)** are prevailing in the districts of Sindh (**Umerkot, Tharparkar and Sanghar, Dadu, Jamshoro, Khairpur, Shahdad Kot and Shaheed Benazirabad**), central and southern districts of Balochistan (**Chagi, Gawadar, Harnai, Kech, Kharan, Mastung Nushki, Pishin, Panjgur, Qila Abdullah, Quetta and Washuk**) and the Cholistan region (**Bahawalpur, Bhawalnagar and Rahim Yar Khan**) in Punjab. Low rainfall and high temperature emerged the water stress conditions which have started to impact the vegetation over these areas.

## **National Drought Monitoring & Early Warning Centre (NDMC)**

Headquarters Office, Sector H-8/2, Islamabad

Tel : + (92-51) 9250598, Fax: + (92-51) 9250368, URL: <http://www.pmd.gov.pk>

## Table of Contents

<b>S.No.</b>	<b>Contents</b>	<b>Page #</b>
1	Weather Summary for August, 2023	3
2	Drought Situation Analysis	4
I	Monthly Normal to Actual Rainfall Comparison	5
II	Normalized Difference Vegetation Index (NDVI)	6
III	Land Surface Temperature (LST)	6
IV	Temperature Vegetation Index (TVDI)	7
V	Length of Consecutive Dry Days	7
3	Water availability/ Dams flow data	8
4	Weather Outlook for September, 2023	9
5	Drought Outlook for September, 2023	9
6	Crop Condition	9
7	Advice for Farmers	10

This Bulletin is regularly being published on monthly basis under the guidance of  
**Chief Meteorologist, NDMC, Pakistan Meteorological Department.**

**Chief Editor:** Dr.Shahzada Adnan, Senior Meteorologist, NDMC, Islamabad

**Editor:** Nasir Yaseen, Meteorologist, NDMC, Islamabad

## 1. Weather Summary for August, 2023

The spatial distribution of rainfall is shown in Figure 1. During August 2023, Light, and moderate-rainfall receives across the country whereas Gilgit Baltistan, isolated parts of Khyber Pakhtunkhwa, Balochistan and most areas of Sindh province received trace or zero rainfall during the month. The chief amounts of monthly rainfall recorded across Pakistan during August 2023 are shown in Table 1.

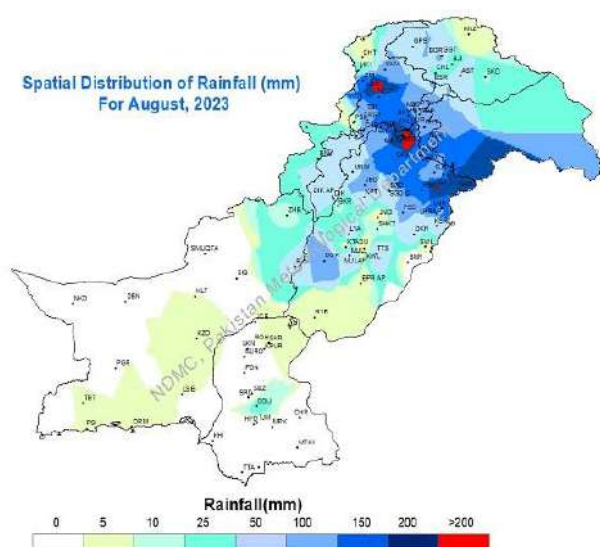


Figure 1: Spatial Distribution of rainfall

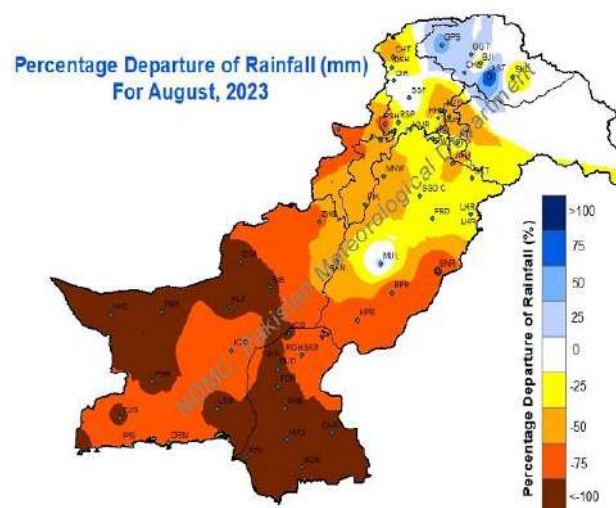


Figure 2: Percentage Departure of rainfall

Figure 2 depicts the percentage departure of rainfall from the normal. Below-normal rainfall was recorded at most of the places in the country except Astor and Gupis received above than its normal rainfall shown in blue colour.

Table 1: Chief amount of rainfall recorded across Pakistan during August, 2023					
Sr.No.	Station	Rainfall(mm)	Sr.No.	Station	Rainfall(mm)
1	Saidpur-Islamabad	266	11	Mangla	145.61
2	Lower Dir	231	12	Kamra	142.1
3	Islamabad, Zeropoint	216.82	13	Kakul	141.01
4	Chaklala	214.01	14	Chakwal	140.7
5	Gujranwala	203.32	15	Malamjabba	133
6	Barnala	169.4	16	Buner	128.9
7	Sialkot Cantt	166.76	17	Lahore, Airport	125.07
8	Pashat-Bajaur	157	18	Kotli	124
9	Lukshmi	156.01	19	Dir	122.01
10	Narowal	153.61	20	Hafizabad	112.4

## 2. Drought Situation Analysis

The spatial drought monitor map based on the output results from different drought monitoring indices and Pakistan Meteorological Department ground station data across Pakistan is represented in Figure. 3.

Due to the below-normal rainfall (August 2023), **abnormally dry conditions (mild drought)** are prevailing in the districts of Sindh (**Umerkot, Tharparkar and Sanghar, Dadu, Jamshoro, Khairpur, Shahdad Kot and Shaheed Benazirabad**), central and southern districts of Balochistan (**Chagi, Gawadar, Harnai, Kech, Kharan, Mastung Nushki, Pishin, Panjgur, Qila Abdullah, Quetta and Washuk**) and the Cholistan region (**Bahawalpur, Bhawalnagar and Rahim Yar Khan**) in Punjab. Low rainfall and high temperature emerged the water stress conditions which have started to impact the vegetation over these areas

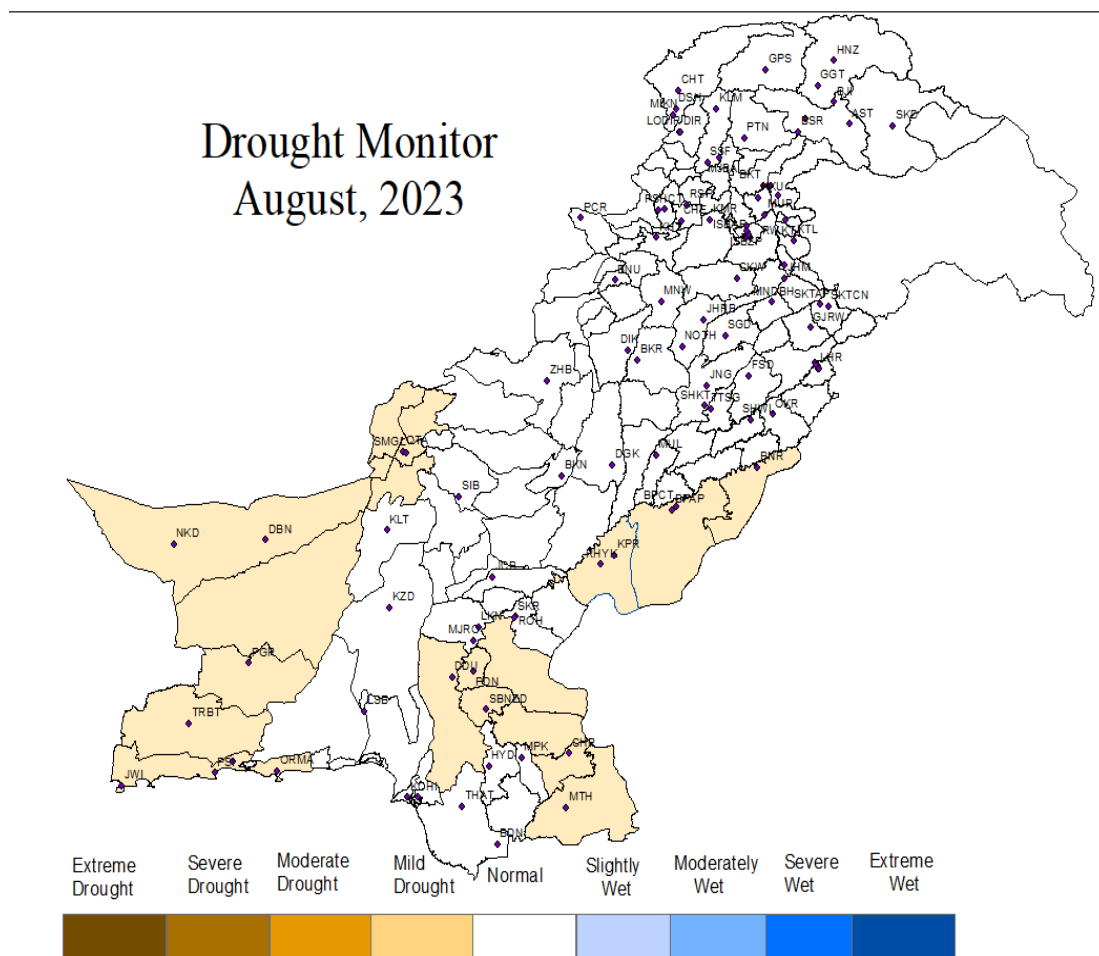
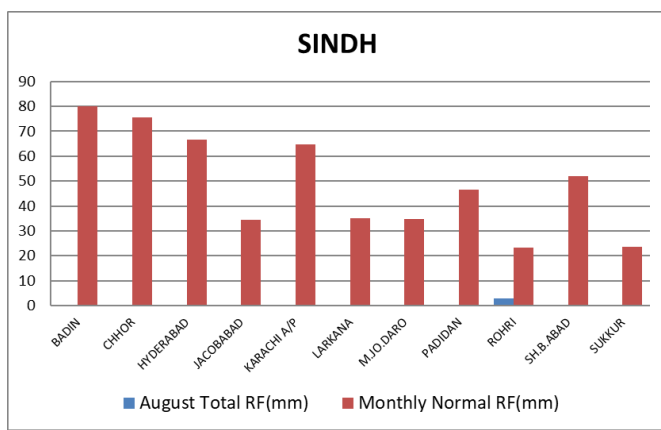
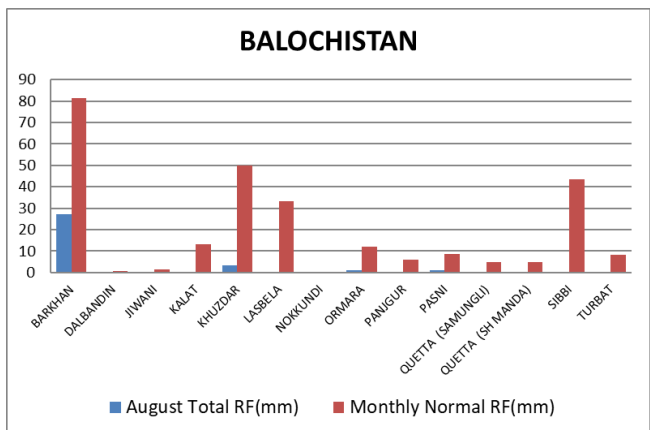
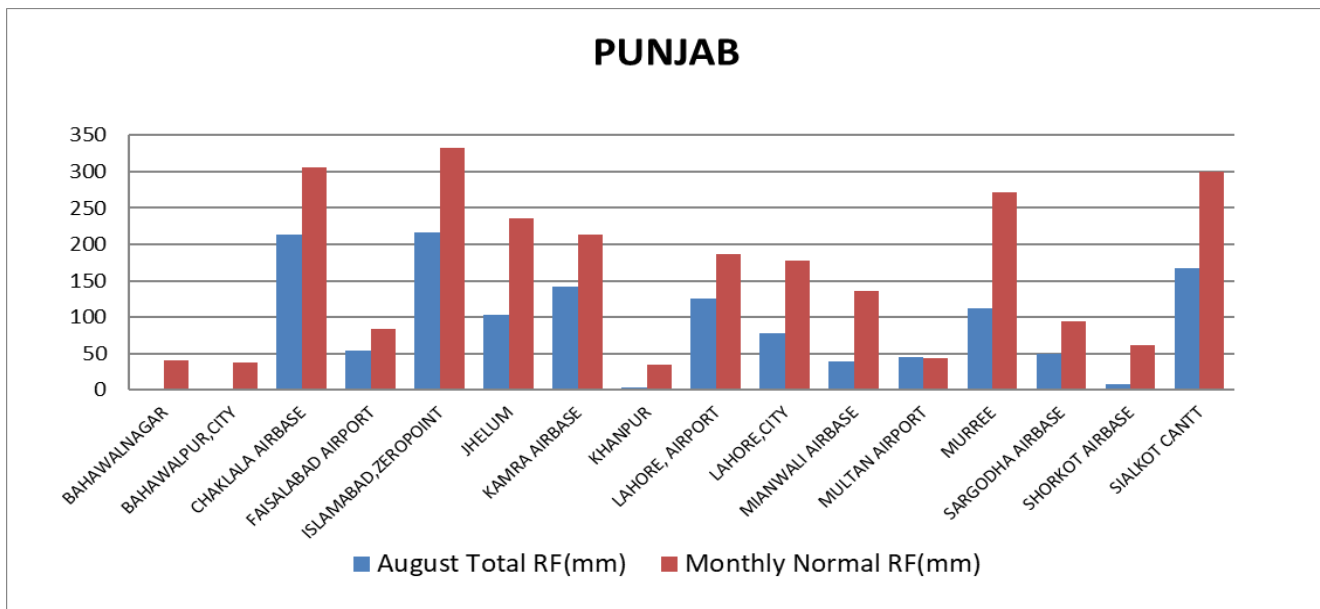
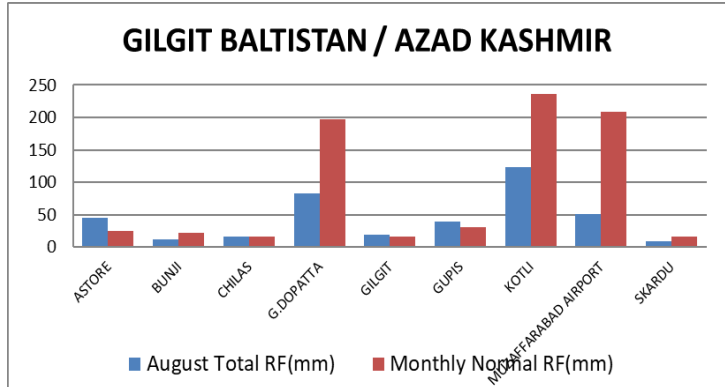
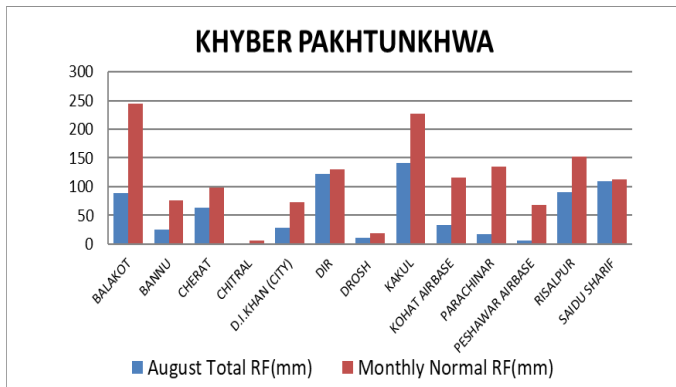


Figure 3: Drought Monitor of Pakistan

# I. Monthly Normal to Actual Rainfall Comparison for August, 2023



## II. Normalized Difference Vegetation Index (NDVI)

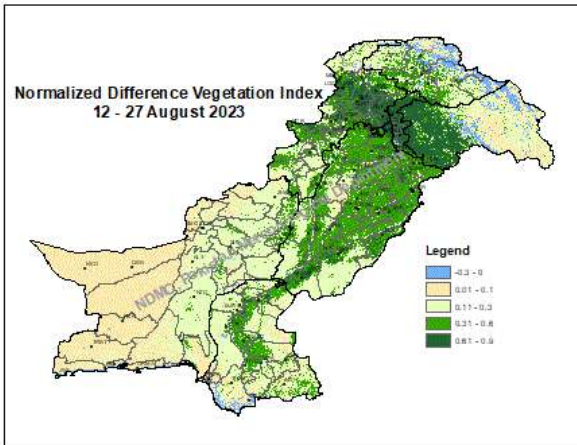


Figure 4: NDVI

Normalized Difference Vegetation Index values for August 2023 are shown in Fig.4. NDVI conditions in AJK, Punjab, Khyber Pakhtunkhwa, and along the Indus belt are good, depicting the widespread vegetation in fields good conditions due to good chlorophyll content stored in the plants and the vegetation cover. However, the southwestern districts and coastal areas of Balochistan and rainfed districts of Sindh and Cholistan (Punjab) are showing sparse vegetation cover.

## III. Land Surface Temperature (LST)

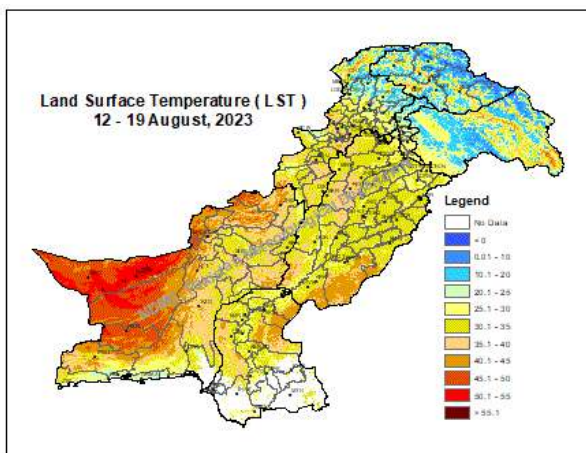


Figure 5: LST ( $^{\circ}$ C)

Land Surface Temperatures (LST) for the period 12–19 August 2023 are represented in Fig. 5. In the central parts of the country, average daytime temperatures were above  $30^{\circ}$ C while in lower parts of the country, the temperature was reported above  $35^{\circ}$ C during the period.

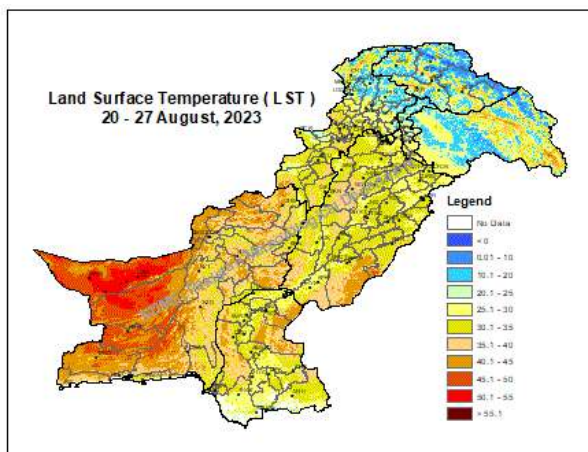


Figure 6: LST ( $^{\circ}$ C)

LandSurface Temperatures during the period 19 – 26 August are shown in Fig. 6. In some areas in the north decrease in temperature trend has been observed due to the weather system while in the south increase in temperature is observed as compared to the preceding month.

#### IV. Temperature Vegetation Dryness Index (TVDI)

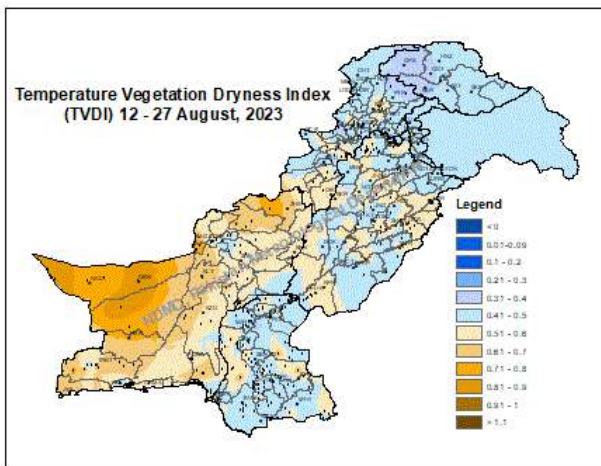
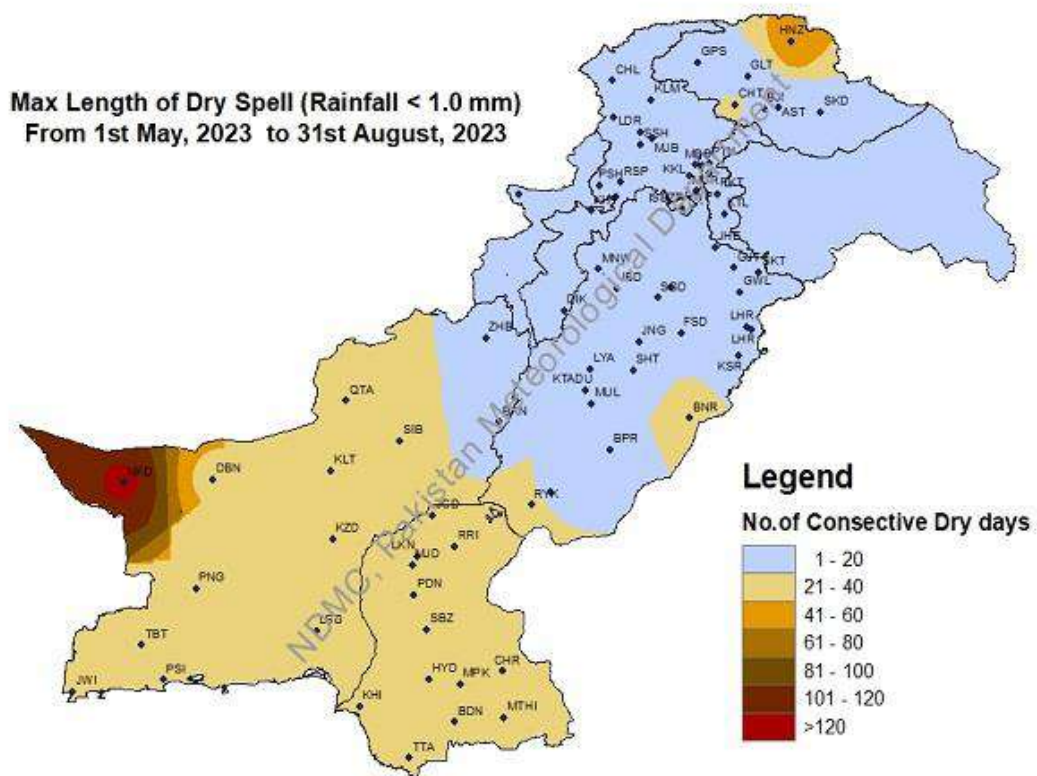


Figure 7: TVDI

Temperature Vegetation Dryness Index (TVDI) derived from MODIS products MOD13A2 (NDVI) and MOD11A2 (LST) is shown in Fig. 7, which indicates mild dry conditions are shown by the TVDI Index showing the start of dryness and less soil moisture conditions in the western Balochistan, coastal areas and some parts of Sindh and Punjab as well.

#### V. Length of Consecutive Dry Days:



The month of August remained dry in most of the southern parts of the country which has created abnormal dry conditions (Mild drought) over these areas.

### 3. Water availability/ Dams flow data:

In August 2023, water inflow, outflow and levels of the Rawal, Khanpur, Tarbela and Mangla dams are shown in Figs. 8 & 9. The dam storage capacity reached at maximum level at Terbela and Mangla. Khanpur, Simly and Rawal reservoirs have risen due to rainfall in their catchment areas.

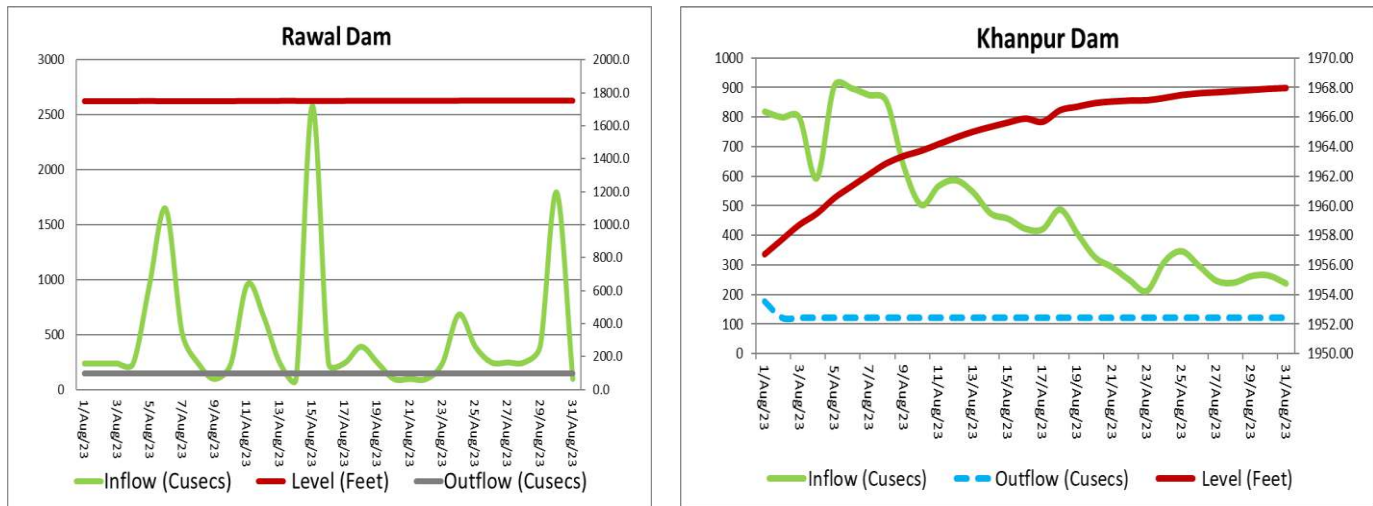


Figure 8: Water inflow, outflow and level of Rawal and Khanpur Dams

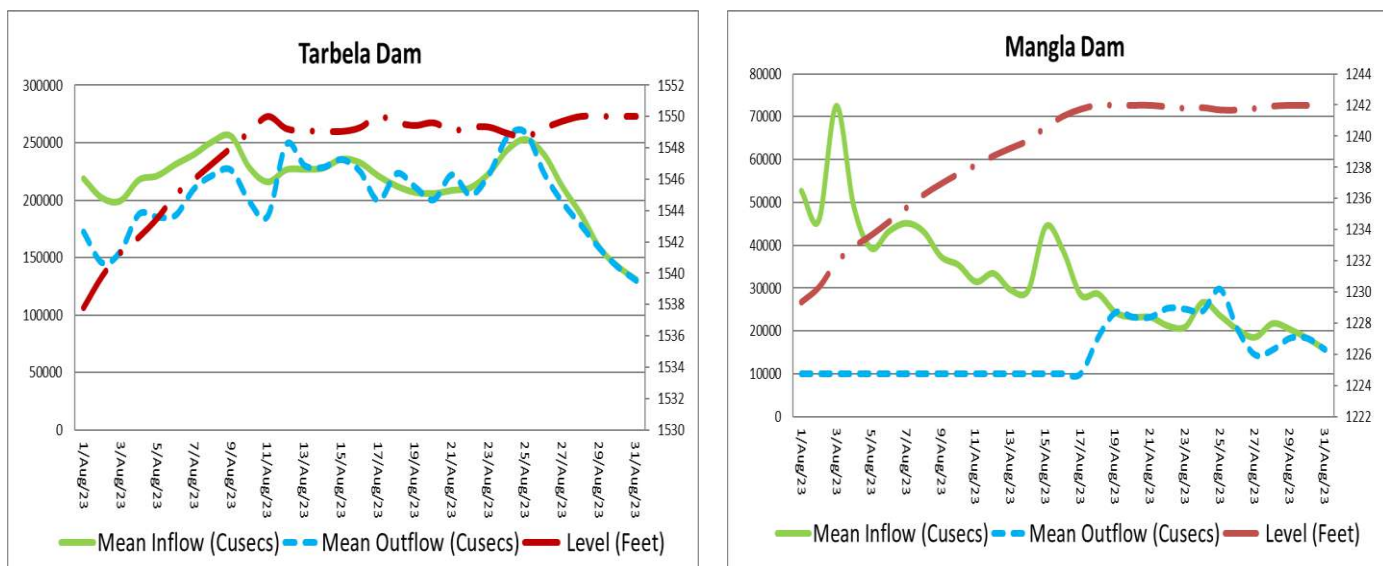


Figure 9: Water inflow, outflow and level of Tarbela and Mangla Dams



#### **4. Weather Outlook for September 2023**

Overall a tendency for near normal rainfall is expected in most parts of the country. Thunderstorms with isolated heavy falls are expected during the forecast month. Temperatures are forecasted to remain slightly above normal nationwide.

#### **5. Drought Outlook for September 2023**

Keeping in view the forecast for September 2023, previously drought-affected areas of Sindh Province district Umerkot, Tharparkar and Sanghar, Dadu, Jamshoro, Khairpur, Shahdad Kot and Shaheed Benazirabad while in Balochistan Province district Chagi, Gawadar, Harnai, Kech, Kharan, Mastung Nushki, Pishin, Panjgur, Qila Abdullah, Quetta and Washuk) and the Cholistan region (Bahawalpur, Bhawalnagar and Rahim Yar Khan) in Punjab are facing moisture stress conditions, and may not get enough relief as compared to the previous month.

**All stakeholders are requested to make all efforts to save the water available across rain-fed areas of Sindh, Balochistan and Cholistan region in Punjab, especially in previously drought-affected areas and plan DRM activities accordingly.**

#### **6. Crop Condition:**

The Kharif Crops season varies by region, starting at the earliest May-August. Kharif crops are usually sown at the beginning of the first rains during the advent of the southwest monsoon season, and they are harvested at the end of the monsoon season (October). Vegetations over the rainfed areas of Sindh, Balochistan and Punjab have faced moisture stress. No serious pest/insect attack has been reported so far.

## **7. Advice for Farmers:**

- I. Pest/viral attacks and more weed growth are expected after monsoon rains in sugar cane and other standing crops in the upper parts of the country. Farmers are therefore advised to take precautionary measures in this regard well in time.
- II. Farmers of the rainfed areas obtaining water through tube wells and irrigated areas in upper parts are advised to schedule the irrigation according to the expected weather forecasts.
- III. Rainfall/ gusty winds after irrigation cause water logging in the standing crops like maize, sugarcane and cotton. Farmers should be very careful in this regard.
- IV. Farmers of cotton belts are advised to be aware of the adverse effects of stagnant water in the fields. Mechanism for drainage of stagnant water from fields should be evolved on a priority basis and necessary requirements in this regard should be taken.