

# Monthly Drought Bulletin For the Month of September 2023



## Highlights

- During the month of September 2023, Light, moderate and Heavy rainfall events were reported across the country where as most of the areas in Balochistan and Sindh received trace to zero rainfall during the month.
- Precipitation over most of the drought-prone areas of Balochistan, Nokundi were below normal while in Sindh province, Mithi, Chorr were above normal and give relief to moisture stress conditions over there.
- 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.
- Some relief in moisture stress areas of Sindh, Baloshitan and Cholistan in Punjab has been observed. Keeping in view the weather forecast for the month of October 2023, disaster management authorities are requested to plan DRM activities accordingly.

## National Drought Monitoring 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 the month of September, 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 October, 2023	9
5	Drought Outlook for October, 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 the month of September, 2023

The spatial distribution of rainfall is shown in Figure 1. During September 2023, Light, moderate and Heavy rainfall events reported 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 September 2023 are shown in Table:1

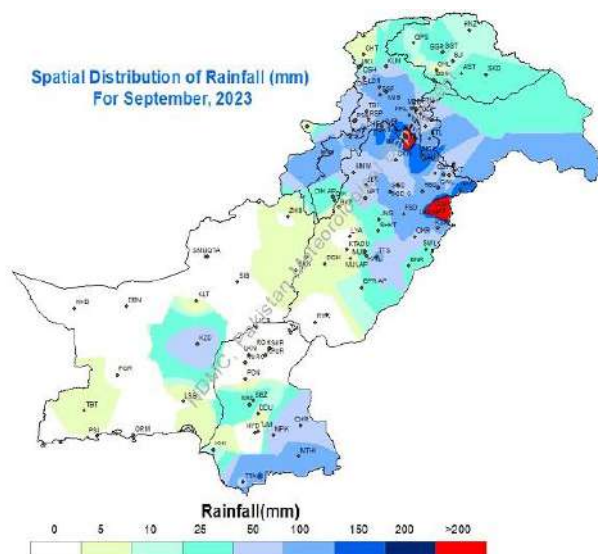


Figure 1: Spatial Distribution of rainfall

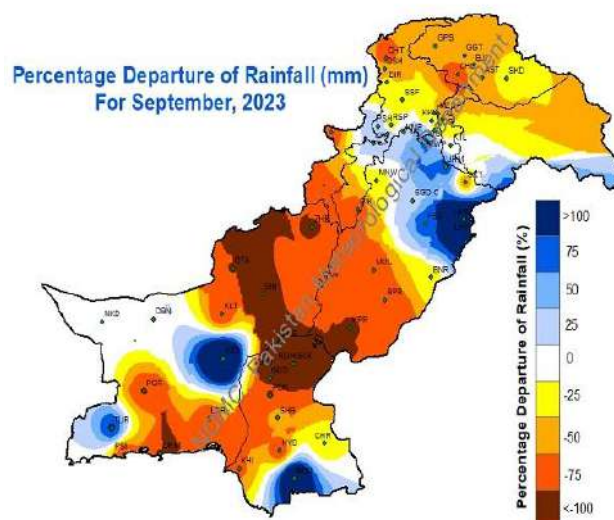


Figure 2: Percentage Departure of rainfall

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 Lahore, Jhelum, Khuzdar and Badin received above than its normal rainfall shown in blue colour.

Table-1: Chief amount of rainfall recorded during the month of September, 2023					
Sr.No.	Station	Rainfall(mm)	Sr.No.	Station	Rainfall(mm)
1	GULSHAN-E- RAVI-Lahore	349.01	11	MANGLA	108
2	LAHORE, AIRPORT	307	12	ISLAMABAD, AIRPORT	104.32
3	SAID PUR-Islamabad	246	13	BADIN	102.21
4	ISLAMABAD,ZEROPOINT	233.52	14	MURREE	100.51
5	SHAMSABAD-Rawalpindi	211	15	GOLRA	100
6	CHAKLALA AIRBASE	179.3	16	KAKUL	94.81
7	Khaar-Bajaur	150.8	17	FAISALABAD AIRPORT	93.02
8	JHELUM	130.01	18	GULISTAN COLONY	90
9	NAROWAL	121.9	19	KOTLI	88.01
10	ATTOCK	108.21	20	MALAMJABBA	87

## 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.

In Sindh Province district Umerkot, Tharparkar and Sanghar, Dadu, Jamshoro, Khairpur, Shahdad Kot and Shaheed Benazirabad while in Balochistan Province district 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 got some relief except Changi district.

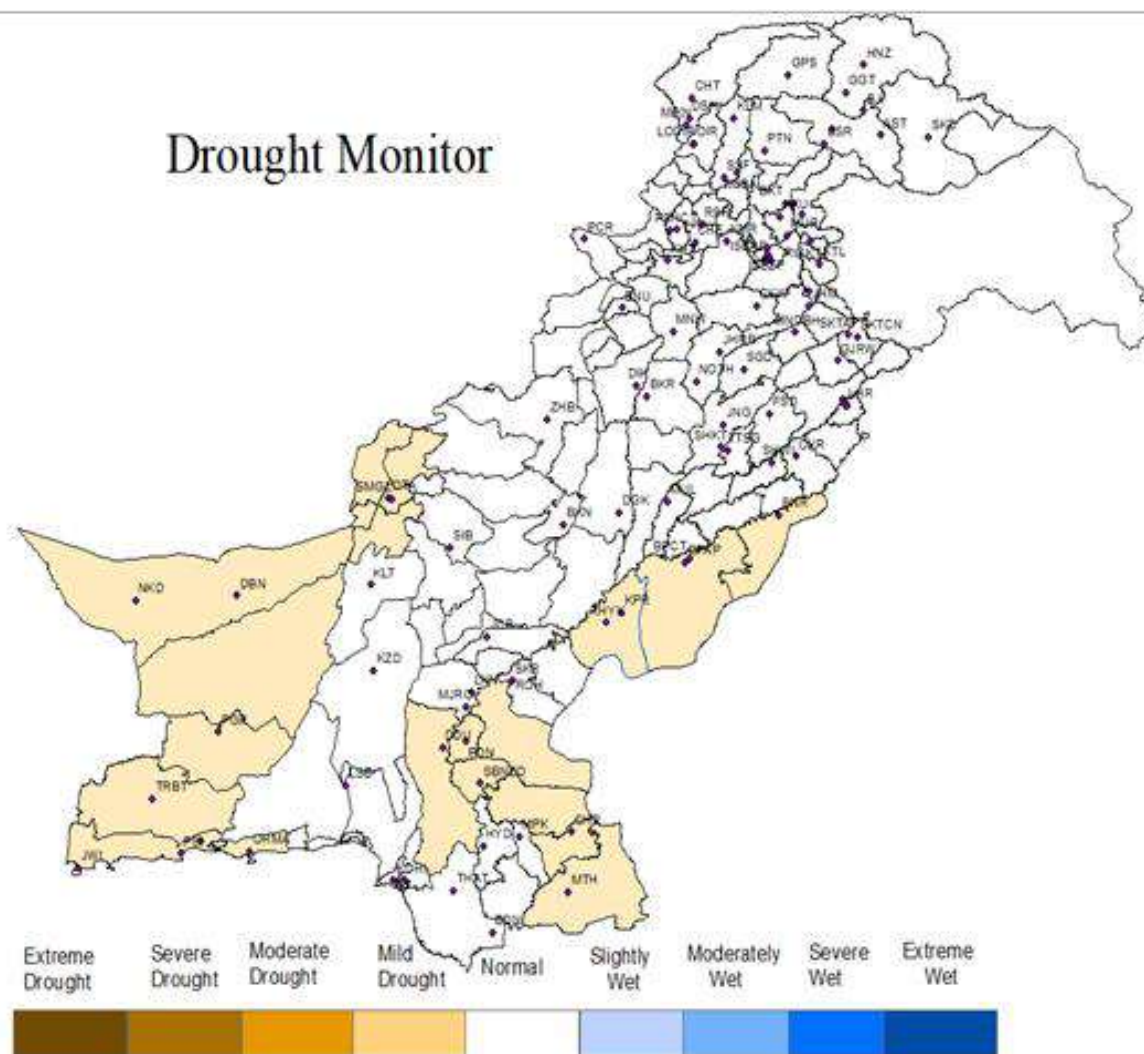
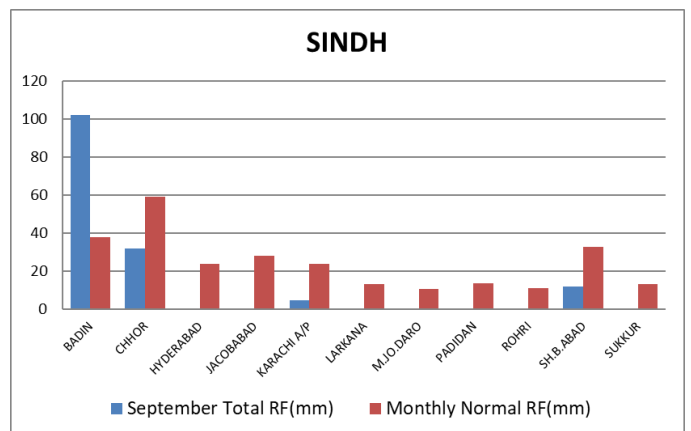
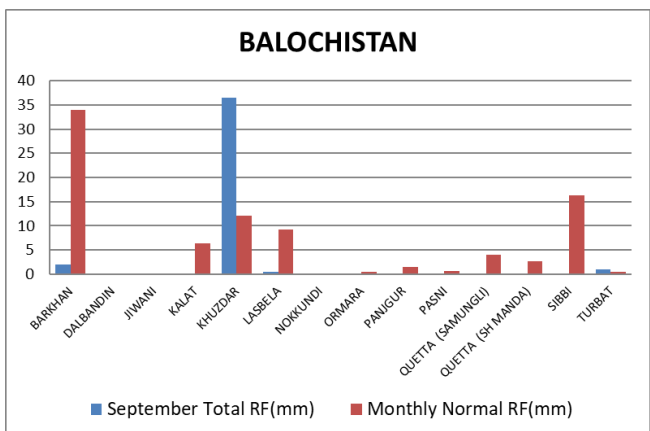
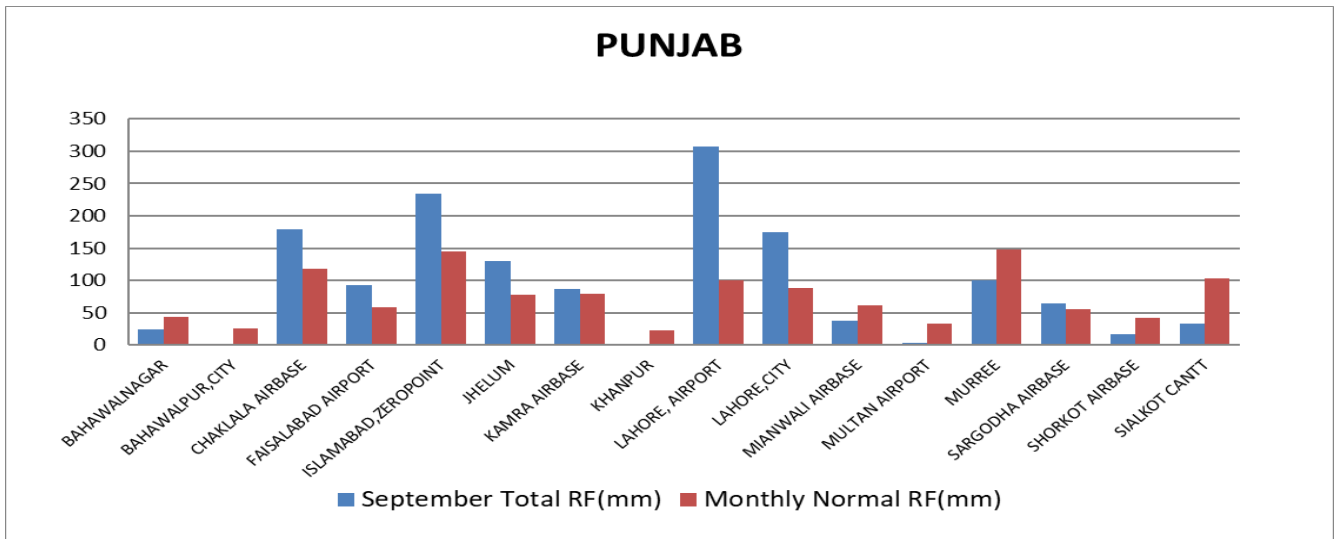
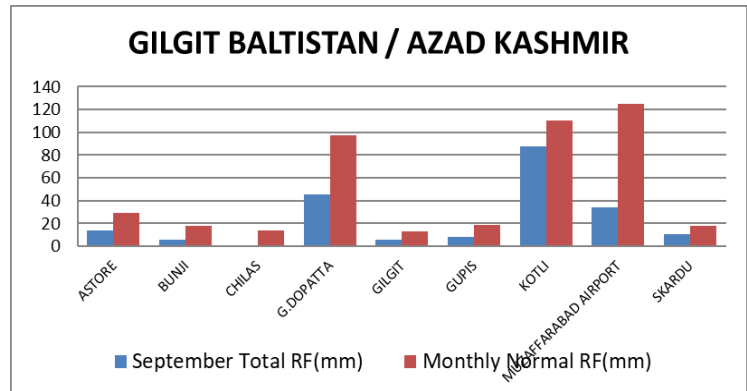
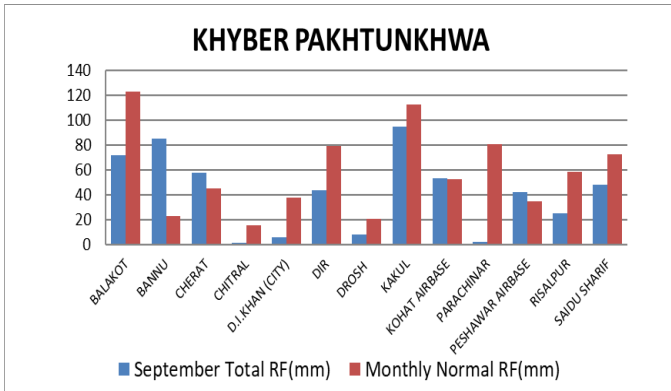


Figure 3: Drought Monitor of Pakistan

# I. Monthly Normal to Actual Rainfall Comparison for September-2023



## II. Normalized Difference Vegetation Index (NDVI)

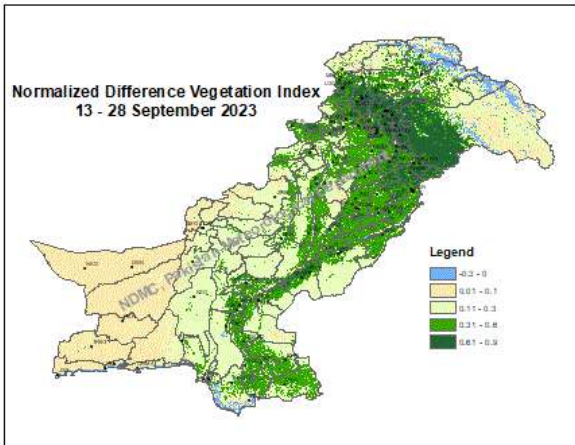


Figure 4: NDVI

Normalized Difference Vegetation Index values for September 2023 are shown in Fig.4. NDVI conditions in AJK, Punjab, Khyber Pakhtunkhwa, and along the Indus belt are good, depicting the wide spread vegetation in fields good conditions due to good chlorophyll content stored in the plants and the vegetation cover.

## III. Land Surface Temperature (LST)

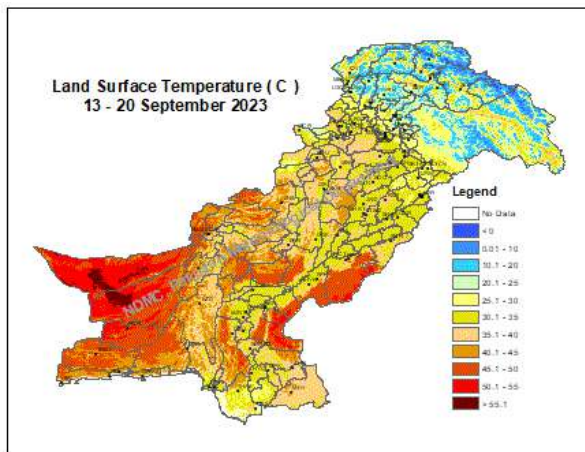


Figure 5: LST ( $^{\circ}$ C)

Land Surface Temperatures (LST) for the period 13 to 20 September 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.

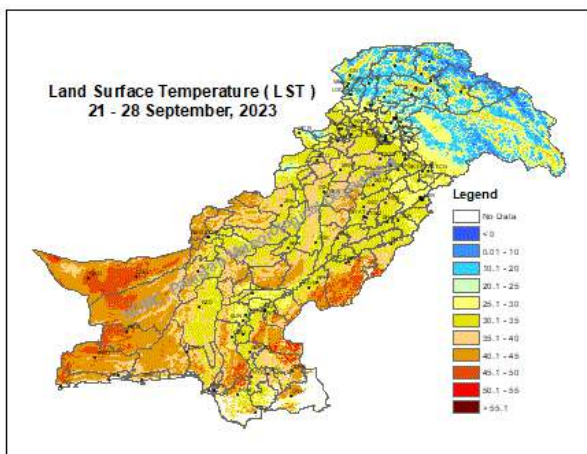


Figure 6: LST ( $^{\circ}$ C)

Land Surface Temperatures during the period 21 – 28 September are shown in Fig. 6. In some areas in the north decrease in temperatures trend has been observed due to the weather system while in the south higher temperatures are observed.

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

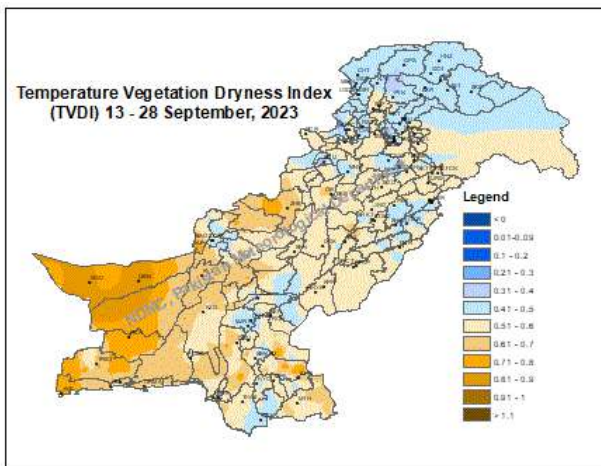
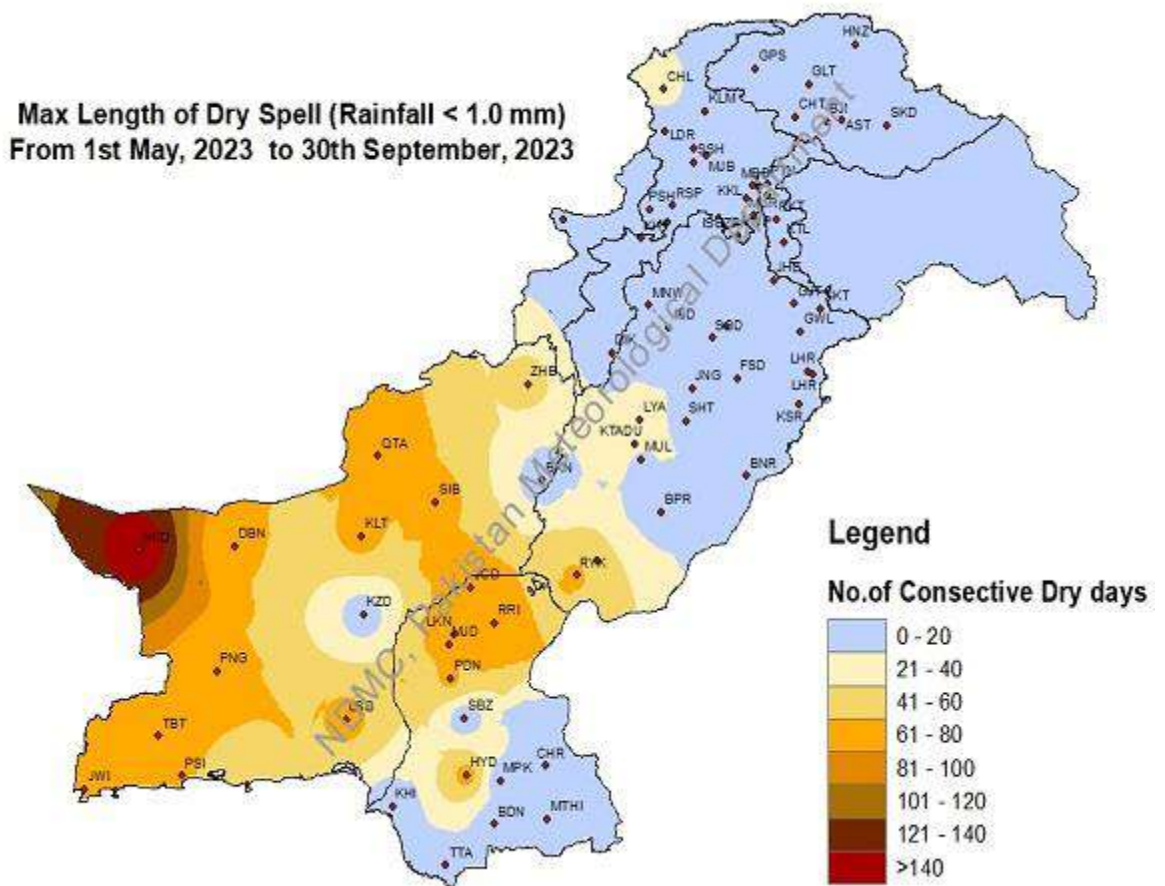


Figure 7: TVDI

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:



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

In the month of September 2023, water inflow, outflow and levels of the Rawal, Khanpur, Tarbela and Mangla dams are shown in Figs. 8 & 9. The level at Terbela, Mangla and Khanpur reservoirs has dropped and at other major reservoirs no change due to less or zero rainfall in their catchment areas.

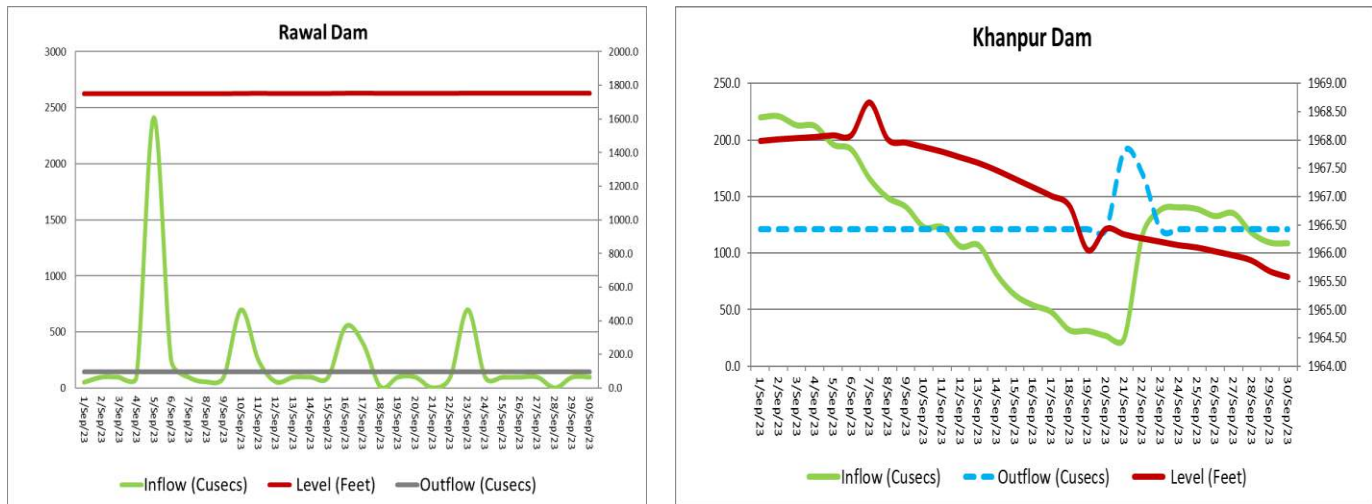


Figure 8: Water inflow, outflow and level of Rawal and Khanpur Dams

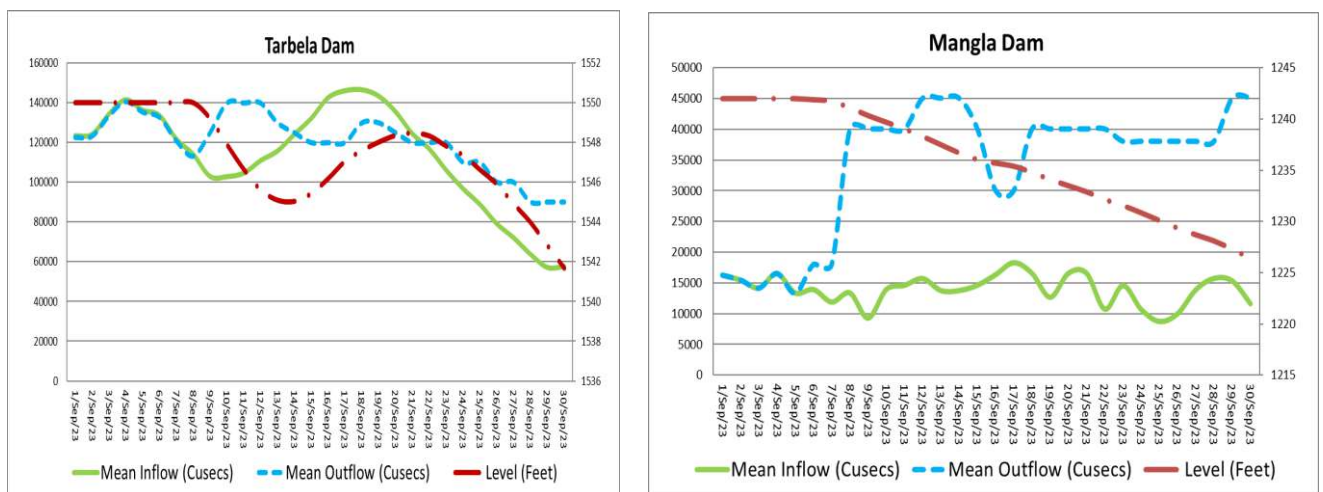


Figure 9: Water inflow, outflow and level of Tarbela and Mangla Dams



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

Overall a tendency for near normal rainfall is expected in most parts of the country. However, Khyber Pakhtunkhwa, comprising the northwestern part of the country is expected to receive slightly above normal rainfall during the forecast month. Temperatures are forecasted to remain slightly above normal nationwide, with maximum departure over eastern Gilgit Baltistan and western Balochistan.

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

Keeping in view the forecast for October 2023, previously drought-affected areas of In 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 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-September. 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). 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 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 belt 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 priority basis and necessary requirement in this regard should be taken.

---

Pakistan Meteorological Department, Sector H-8/2, Islamabad Ph: 051-9250598, Fax: 051-9250368