

## NOVEMBER 2022

### Highlights

- During the month of November 2022, Northern half of the country received normal to above normal rainfall while in southern parts of the country, except Panjgur and Karachi areas most of the areas received below normal rainfall.
- Precipitation over most of the drought-prone areas of Sindh and Balochistan was below normal but due to good rain in preceding months moisture conditions are still normal.
- Normal to below normal precipitation is likely to occur over the country during December. The rainfall is expected to remain below normal over northern half of the country including northern, Punjab, Upper Khyber Pakhtunkhwa, Kashmir and Gilgit-Baltistan. Nearly normal rainfall is expected over most parts of Punjab, Balochistan and Sindh during the month of December
- Drought Conditions has been minimized or terminated over Balochistan and Sindh except Nukundi and Dalbandin areas in Balochistan. Keeping in view the December forecast, Disaster Management Authorities are requested to plan their activities accordingly.

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## Table of Contents

<b>S.No.</b>	<b>Contents</b>	<b>Page #</b>
1	Weather Summary for the month of November, 2022	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 December, 2022	9
5	Drought Outlook for December, 2022	9
6	Crop Condition	10
7	Advice for Farmers	10

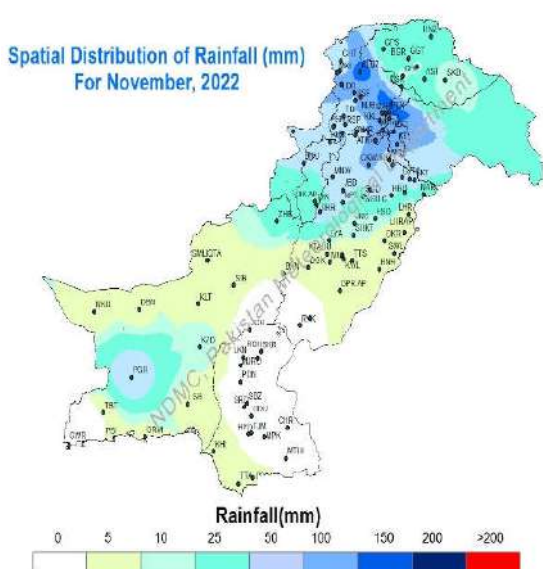
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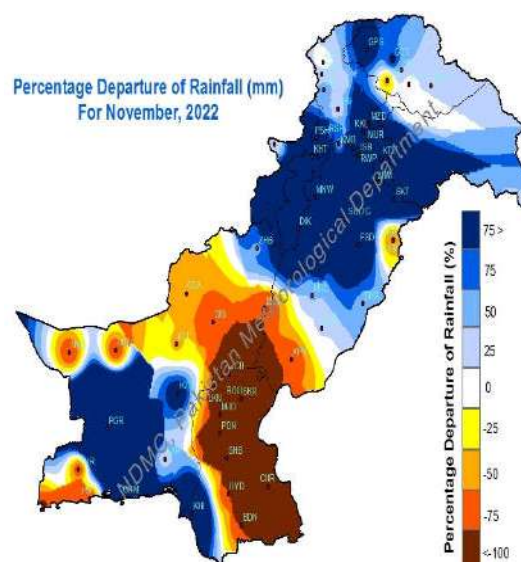
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## 1. Weather Summary for the month of November, 2022

During the month of November 2022, rainfall received across Pakistan is shown in Figure.1. Northern half of the country received good rainfall while most of the southern parts of the country remained dry. The Chief amounts of monthly rainfall recorded across Pakistan during November 2022 are shown in Table:1



**Figure 1: Rainfall distribution for the month of November 2022**



**Figure 2: Percentage Departure of Rainfall for the month of November-2022**

Figure 2 depicts the percentage departure of rainfall from the normal. Northern half of the country received normal to above normal rainfall while in southern parts of the country except areas around Panjgur and Karachi, most of the places received below normal rainfall.

S. No.	Stations	Rainfall (mm)	S. No.	Stations	Rainfall (mm)
1	Kalam	132.4	11	Tirah (KP)	88.4
2	Pattan	130.5	12	Chattar Kalas (AJK)	82.5
3	Rawalakot	101.5	13	Dhulli (Punjab)	81.1
4	Muzaffarabad Airport	100.8	14	Garhi Dupatta	77.8
5	Balakot	100.0	15	Kakul	73.0
6	Murree	95.0	16	Hajira	72.7
7	Dir	91.0	17	Chaklala Airbase	65.5
8	Malam Jabba	91.0	18	Kotli	60.0
9	Haraman	90.3	19	Cherat	57.0
10	Bandi Abbaspur	89.6	20	Chakwal	52.6

## 2. Drought Situation Analysis

Spatial drought analysis results based on the outputs from different drought monitoring indices and Pakistan Meteorological Department ground station data across Pakistan are represented in Figure. 3.

In Southern Balochistan areas around Nokkundi observed dry conditions while in rest of the country conditions are normal.

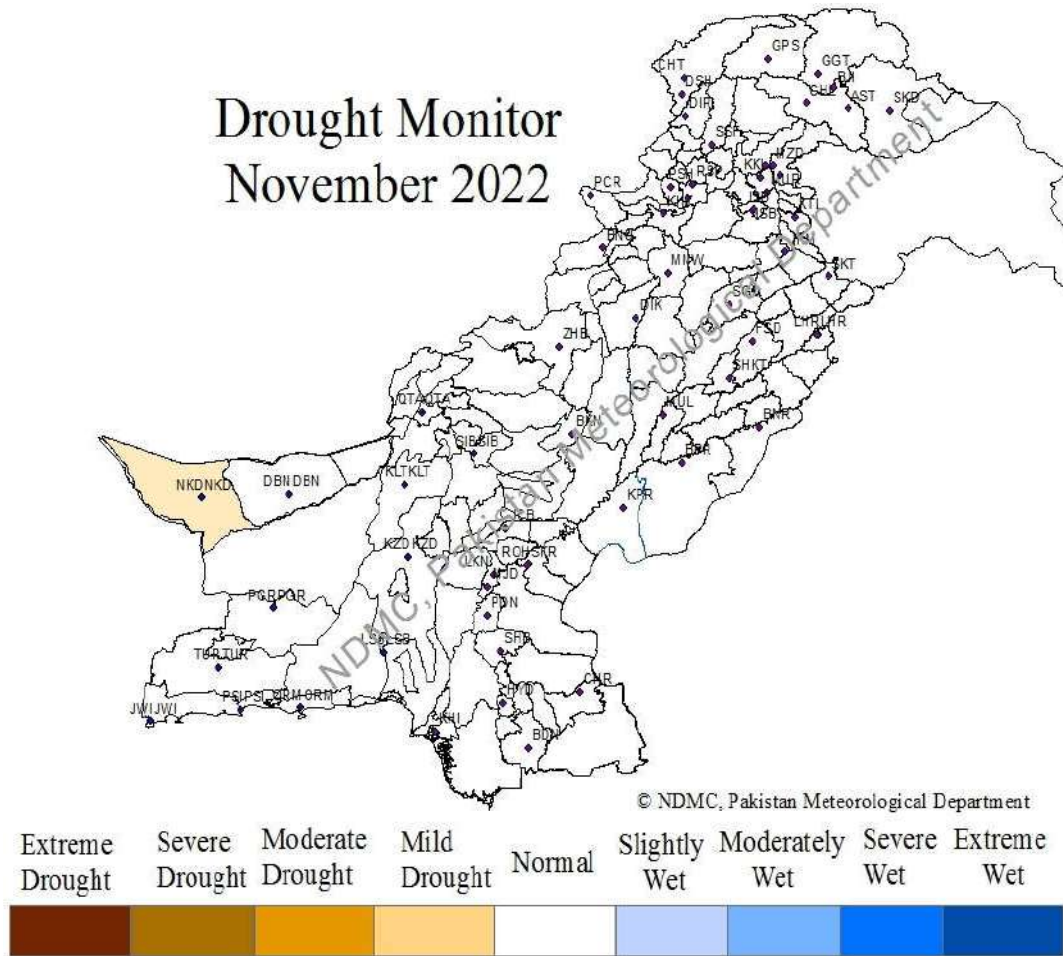
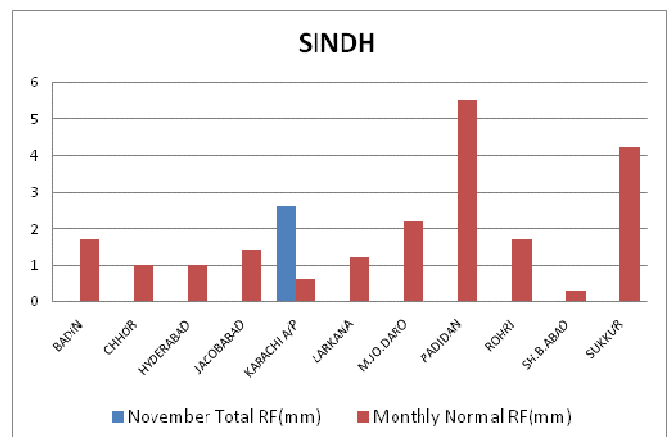
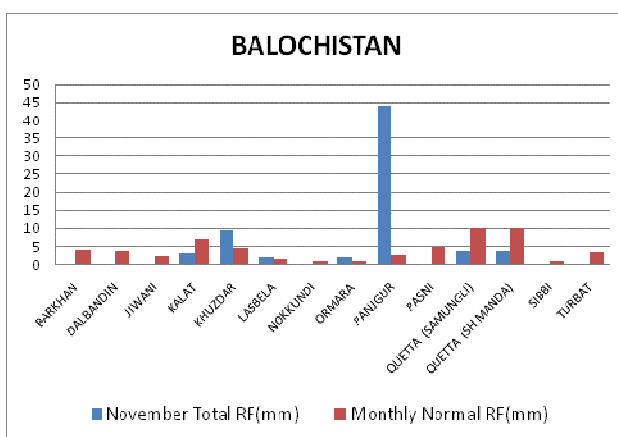
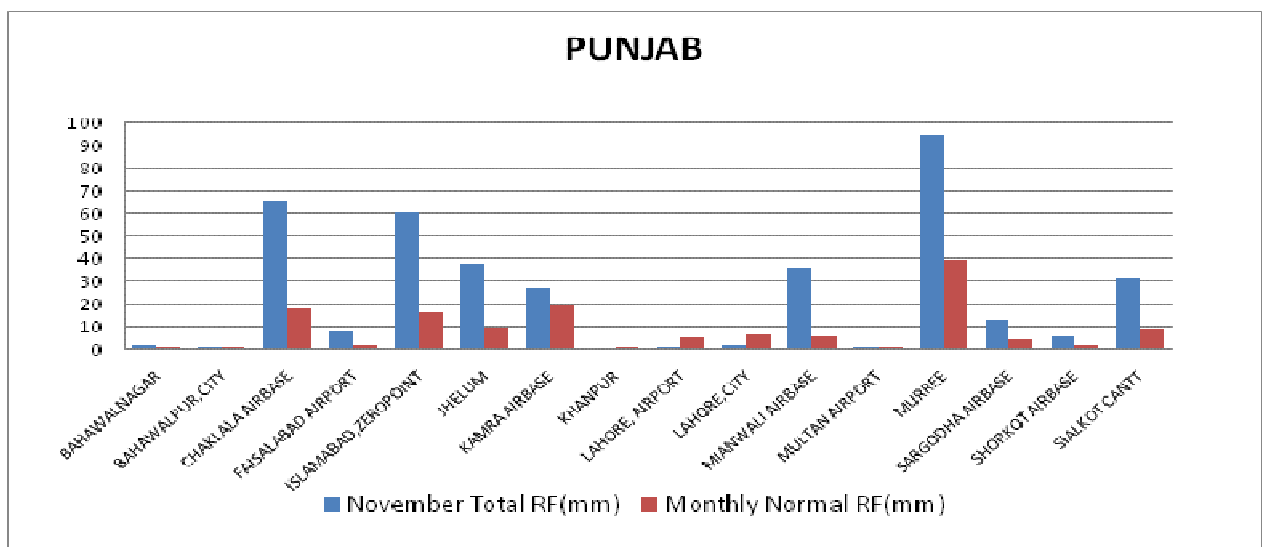
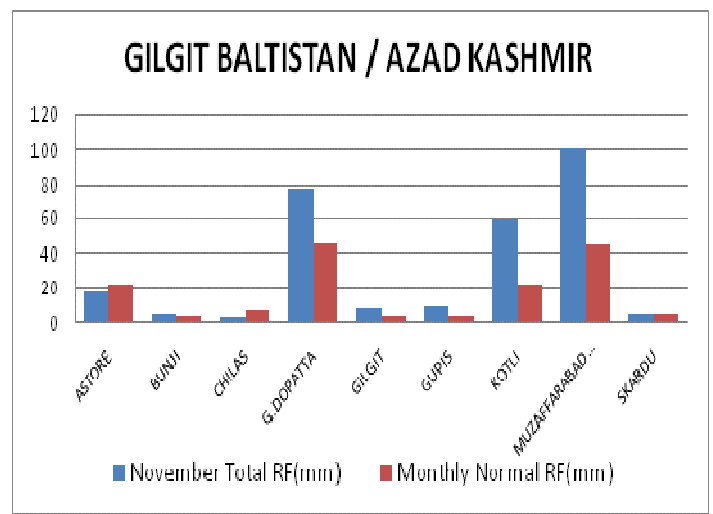
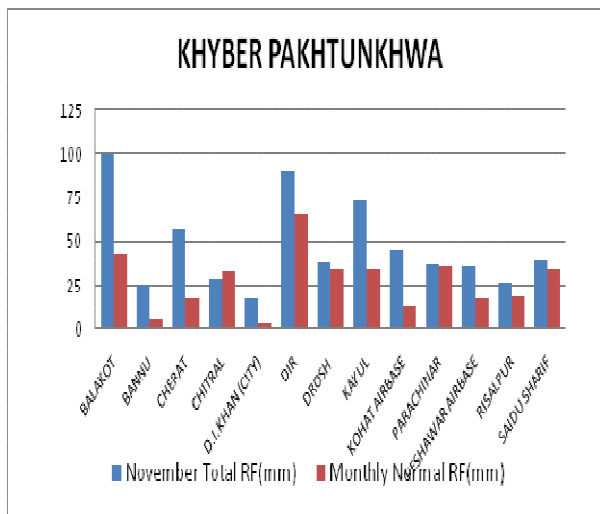


Figure 3: Analysis of Drought conditions in Pakistan

## I. Monthly Normal to Actual Rainfall Comparison for November-2022



## II. Normalized Difference Vegetation Index (NDVI)

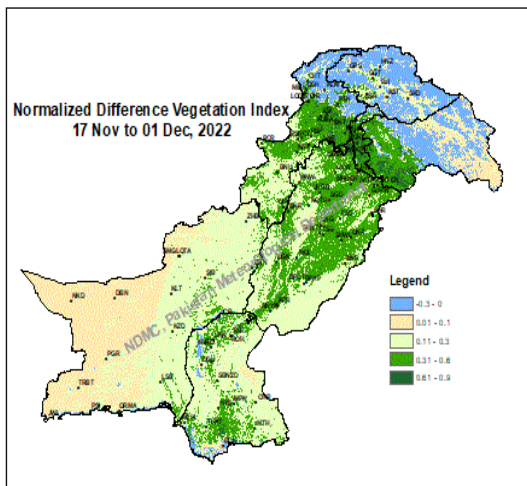


Figure 4: NDVI during 17 Nov to 01 Dec, 2022

Normalized Difference Vegetation Index values for November 2022 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)

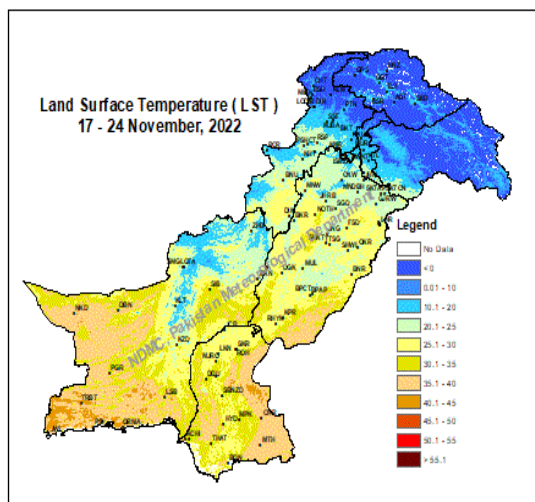


Figure 5: LST ( $^{\circ}\text{C}$ ) during 17-24 November, 2022

Land Surface Temperatures (LST) for the period 17 – 24 November 2022 are represented in Fig. 5. In the central parts of the country, average daytime temperatures remained between  $20^{\circ}\text{C}$  to  $30^{\circ}\text{C}$  while in lower parts of the country, the temperature reported above  $30^{\circ}\text{C}$  during the period.

Land Surface Temperatures during the period 25 Nov to 01 Dec, 2022 are shown in Fig. 6. Decrease in temperatures has been observed in most parts of the country especially in Punjab and Balochistan as compared to the preceding week.

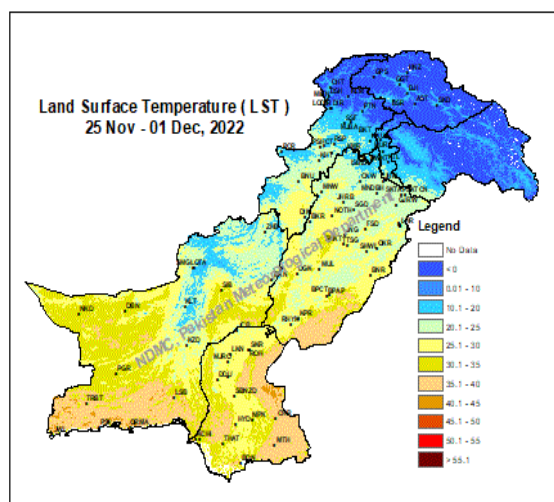
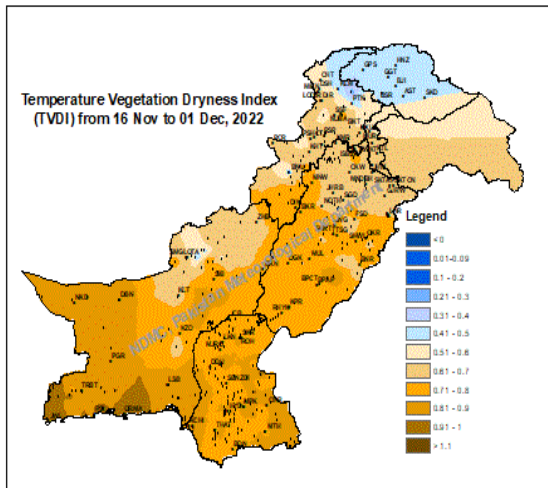


Figure 6: LST ( $^{\circ}\text{C}$ ) during 25 Nov to 01 Dec, 2022

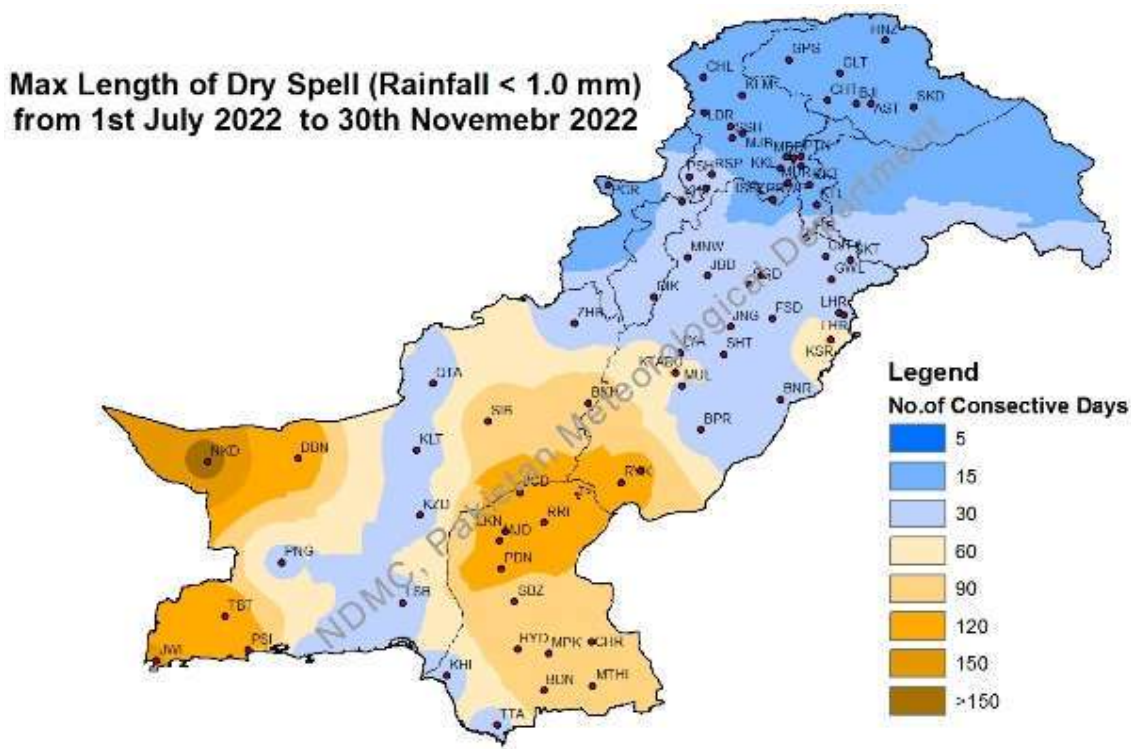
#### IV. Temperature Vegetation Dryness Index (TVDI)



Temperature Vegetation Dryness Index (TVDI) derived from MODIS product 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 dry and less soil moisture conditions in the south east areas of Sindh and western areas in Balochistan. Same picture is arising in the map of length of dry spell given below.

Figure 7: TVDI during 16 – 01 December 2022

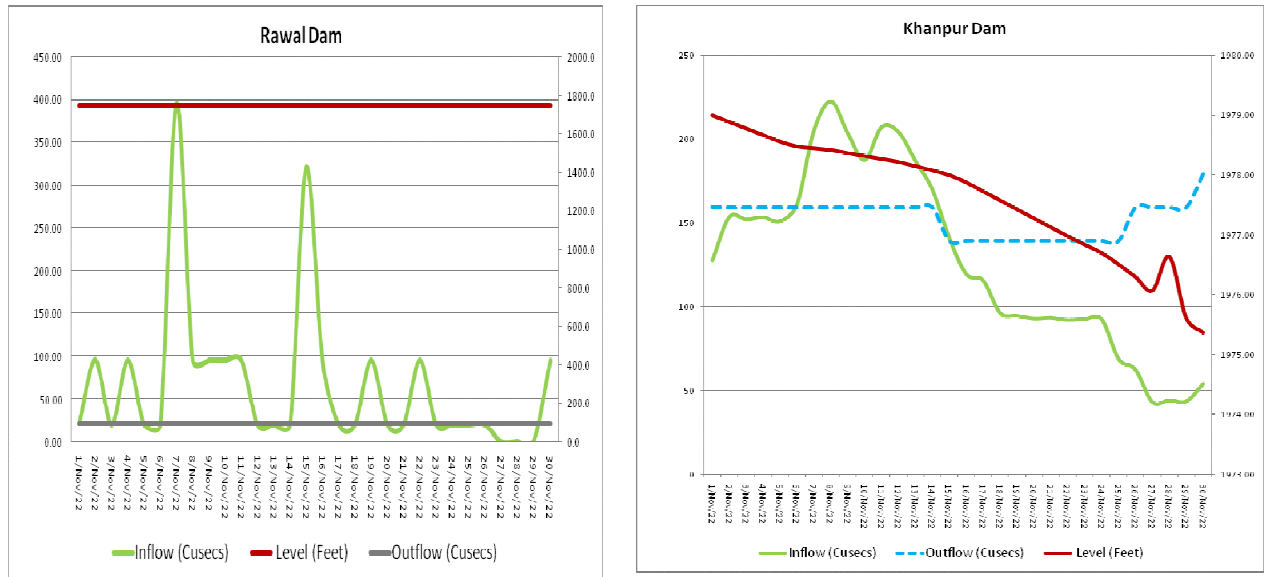
#### V. Length of Consecutive Dry Days:



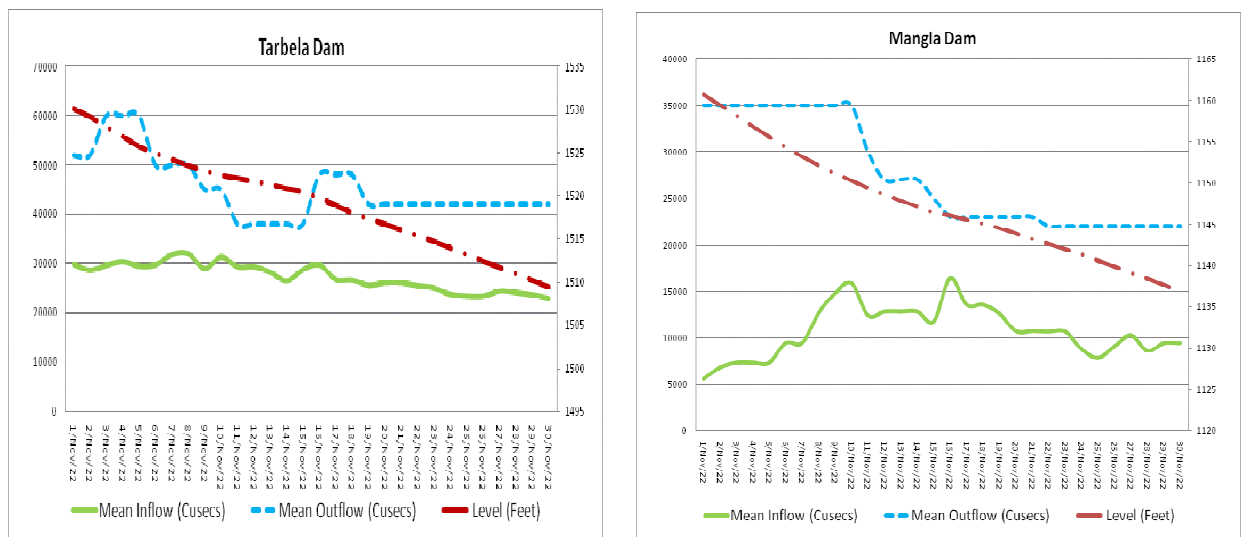
Source: National Drought Monitoring Center-PMD-Islamabad

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

In the month of November 2022, water inflow, outflow and levels of Rawal, Khanpur, Tarbela and Mangla dams are shown in Figs. 8 & 9. Except Rawal dam Level at other major reservoirs has dropped while inflow has also dropped due to less or no rains in the 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 December 2022

Overall, a tendency for normal to below normal precipitation is likely over the country during December. The rainfall is expected to remain below normal over northern half of the country including northern, Punjab, Upper Khyber Pakhtunkhwa, Kashmir and Gilgit-Baltistan. Nearly normal rainfall is expected over most parts of Punjab, Balochistan and Sindh during the month.

#### 5. Drought Outlook for December 2022

The month of December is going to be dry and may not be good for previously drought affected areas of Balochistan and Sindh. At present most of drought conditions have been minimized or terminated.

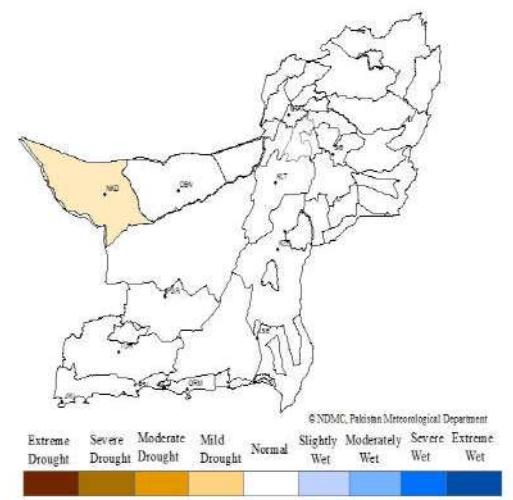


Fig-10: Conditions across Balochistan

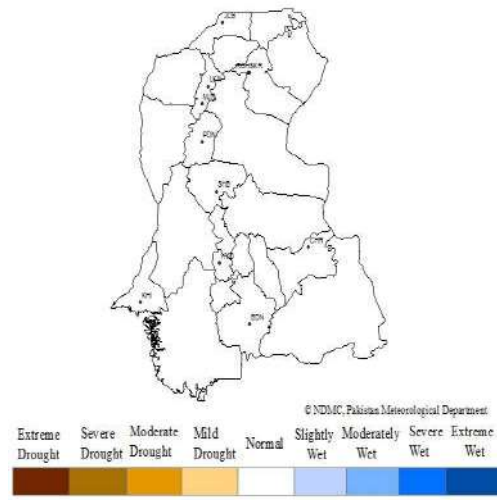


Fig:11 Drought Conditions across Sindh

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

## **6. Crop Condition:**

Sowing of rabi crops get momentum in December. The rainfall in the month of November would help accelerate sowing of rabi crops in KP and upper Punjab. Harvesting of Kharif crops like Maize, Mung bean, sugarcane, Peanut, Sunflower, Soybean, rice, cotton is almost finished.

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

- I. Due to the dry condition during the month of December, the newly sown Rabi crops especially “wheat” would need to be irrigated for a healthier growth at initial stages.
- II. Farmers are advised to schedule the irrigation plans in accordance with the expected weather.
- III. Removing weeds from the standing crops is very important as weeds utilize moisture and food which are to be utilized by the crop.
- IV. Farmers of cotton crop are advised to prepare field for incoming Rabi crops and complete sowing in time.

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