

NOVEMBER 2021

Highlights

- Very Light rainfall events reported during the month of November 2021 at few places in Azad Jammu and Kashmir, Khyber Paktunkhawa and upper Punjab while rest of the country received no rainfall during the period. The Chief amounts of monthly rainfall recorded across Pakistan during the month are shown in Table:1.
- November 2021 rainfall was 94.4% below average for Pakistan as a whole. The worst deficient rainfall hit were the provinces of Balochistan and Sindh, which did not receive any rainfall during the whole month and both ranked as first-driest November on record.
- Mild to Moderate Drought Conditions are prevailing over SW areas of Balochistan. The disaster management authorities may continue surveillance in these areas and plan DRM activities plan accordingly.
- During the month of December 2021, Near Normal precipitation is expected over the country. Northern parts of the country, Balochistan and Khyber Paktunkhawa may receive some precipitation due to western disturbances weather systems in the 3rd and 4th week of December 2021.

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1. Weather Summary for the month of November, 2021

During the month of November 2021, rainfall received across Pakistan is shown in Fig.1. Very Light rainfall events reported during the month of November 2021 at a few places in Azad Jammu and Kashmir, Khyber Paktunkhawa and upper Punjab, while rest of the country received no rainfall comprising most of the areas in Gilgit Baltistan, Punjab, Sindh and Blochistan. The Chief amounts of monthly rainfall recorded across Pakistan during November, 2021 is shown in Table:1

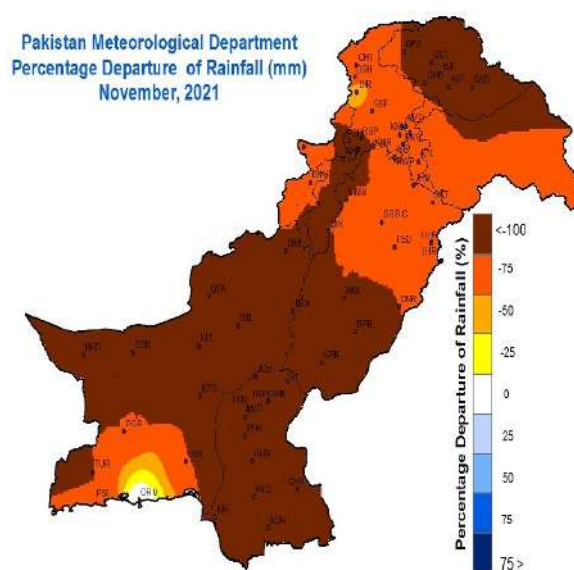
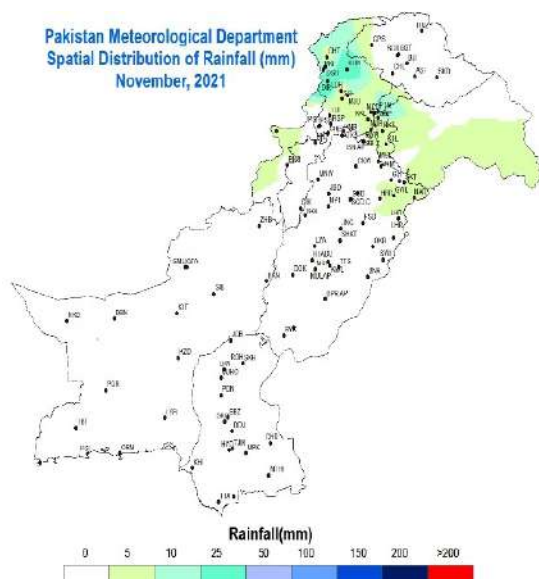


Figure 1: Rainfall distribution for the month of November-2021

Figure 2: Percentage Departure of Rainfall for the month of November-2021

The Fig. 2 depicts the Percentage Departure of Rainfall from the normal. Below Normal rainfall was received in most areas of of country.

Table:-I					
S. No.	Stations	Rainfall(mm)	S. No.	Stations	Rainfall(mm)
1	Kalam	26.2	11	Deolian	3.3
2	Dir	24.0	12	Karachi	3.2
3	Pattan	16.0	13	Chitral	2.8
4	Mirkhani	9.0	14	Pashat-bajaur	2.8
5	Chakothe	6.4	15	Bandi Abbaspur	2.5
6	Malamjabba	5.0	16	Narowal	2.4
7	Tirah-khyber	4.2	17	Garhi Dupatta	2.2
8	Saidu sharif	4.0	18	Hajira	2.2
9	Dhulli	4.0	19	Rawalakot	2.0
10	Drosh	3.6	20	Haraman	1.5

2. Drought Situation Analysis

Spatial drought analysis results using different indices are represented in Fig. 3. In Balochistan, Districts Chagai, Kharan, Panjgur, Washuk and Kech are facing Moderate while Awaran and Quetta are facing Mild Drought Conditions.

In Sindh Province, due to the persistent rains in previous months, Drought conditions have become normal, whereas districts like Karachi, Tharparkar, Badin, Chhor and adjoining areas are showing slightly wet conditions. .

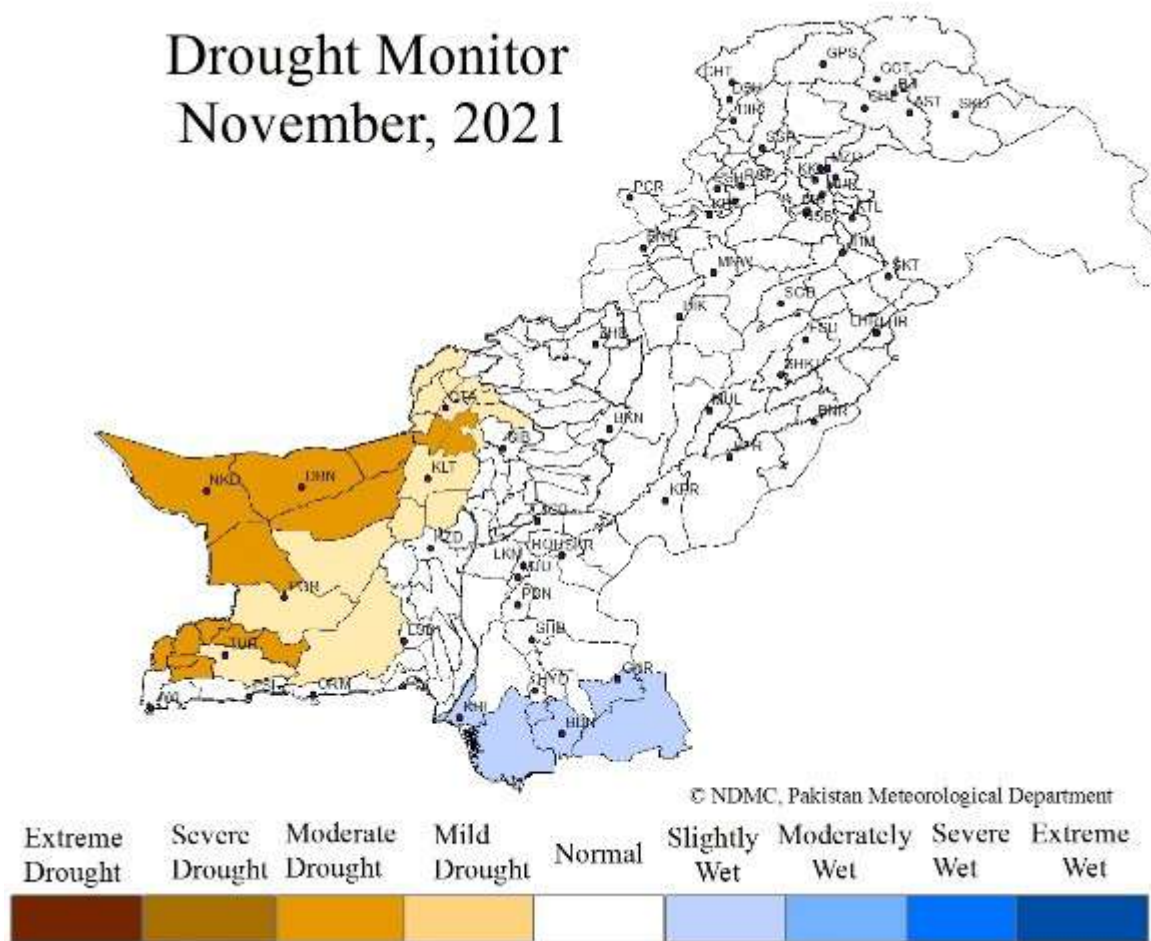
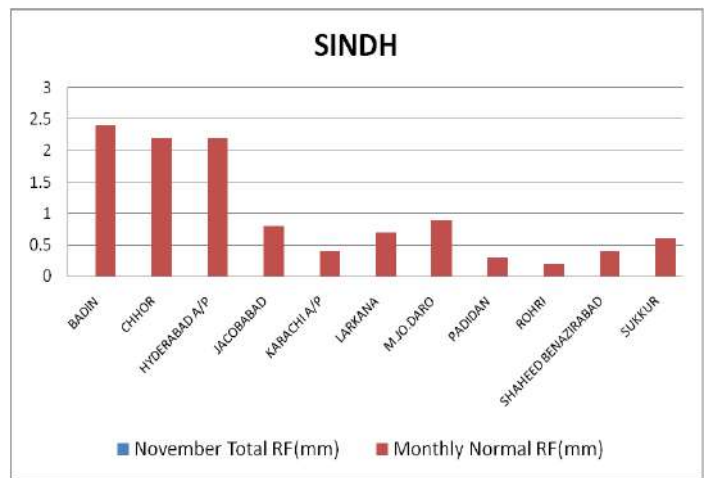
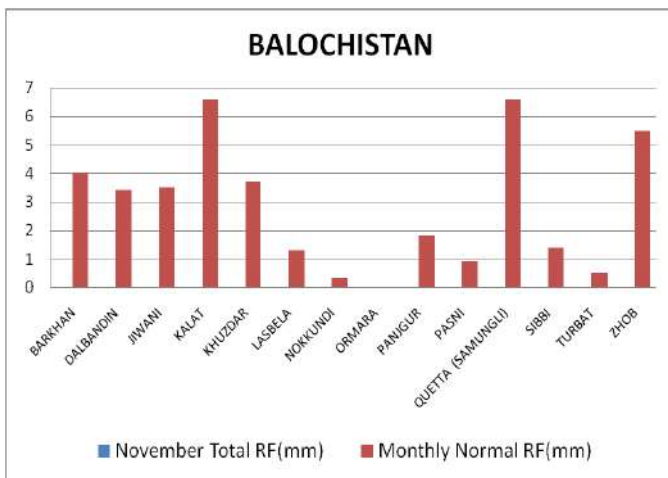
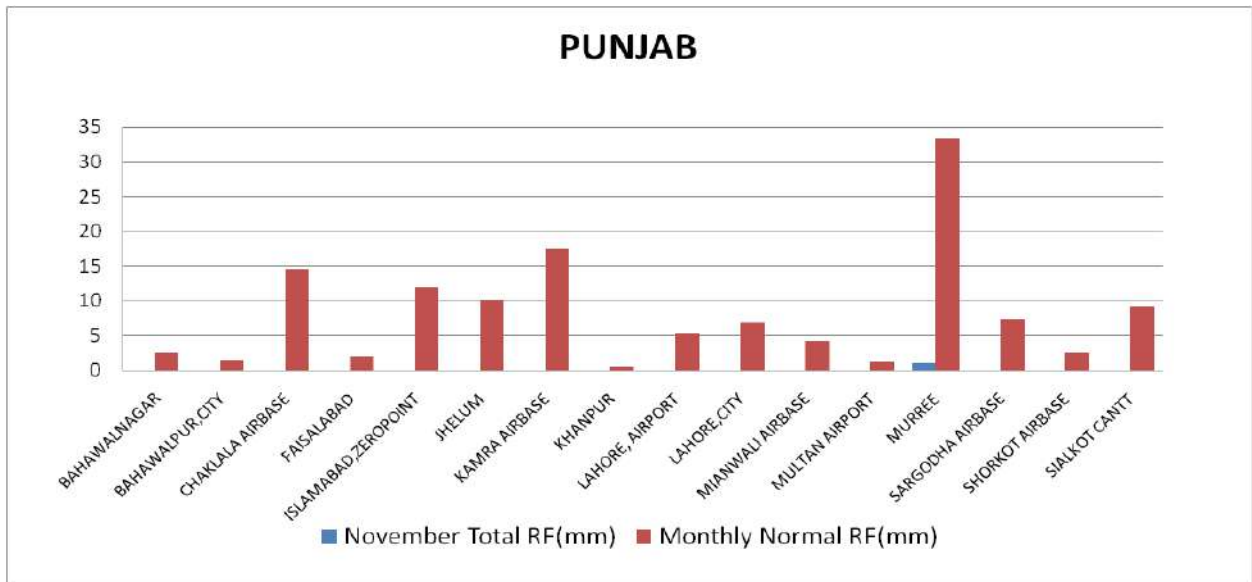
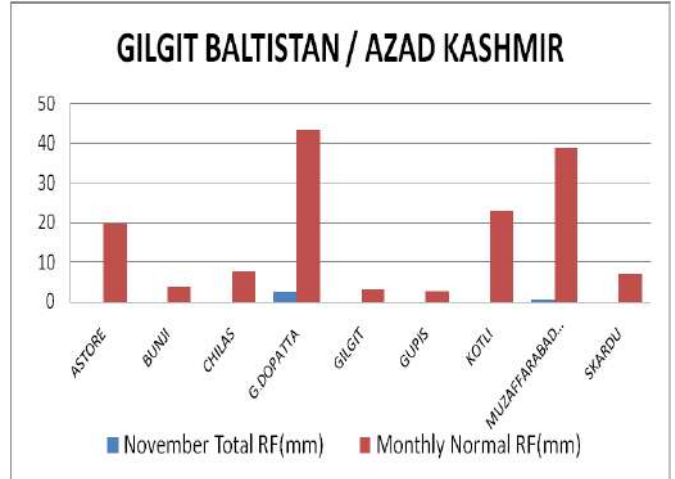
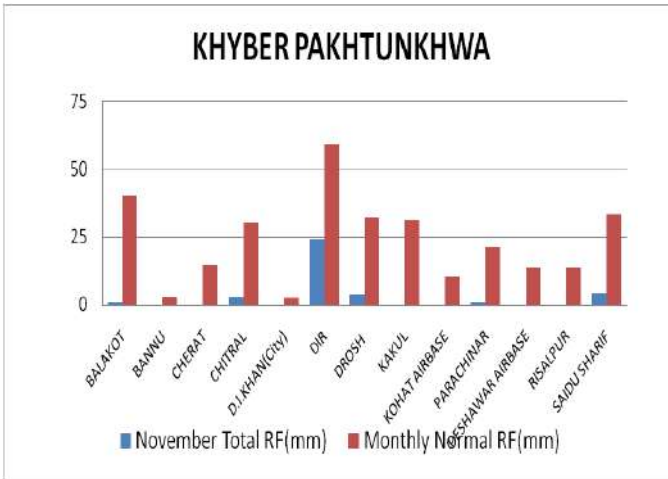


Figure 3: Analysis for Drought conditions of Pakistan

I. Monthly Actual to Normal Rainfall Comparison for November-2021



II. Normalized Difference Vegetation Index (NDVI)

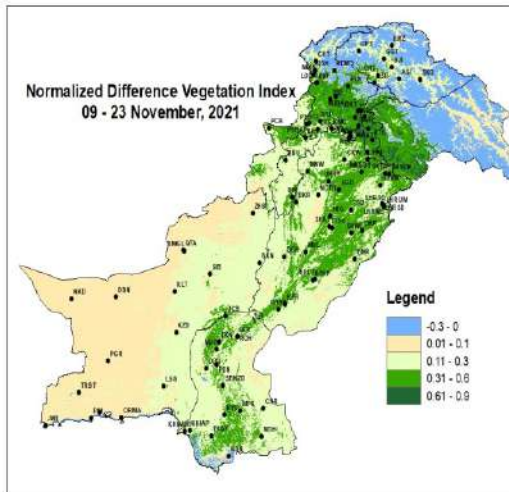


Figure 4: NDVI during 09 – 23 November, 2021

Normalized Difference Vegetation Index values for the month of November 2021 are shown in Fig.4. NDVI conditions in Khyber Pakhtunkhwa, Punjab and along the Indus belt are good, depicting the impacts of well distributed rainfall during the month. Vegetation index is minimum over eastern Sindh and in most of the parts of Balochistan.

III. Land Surface Temperature (LST)

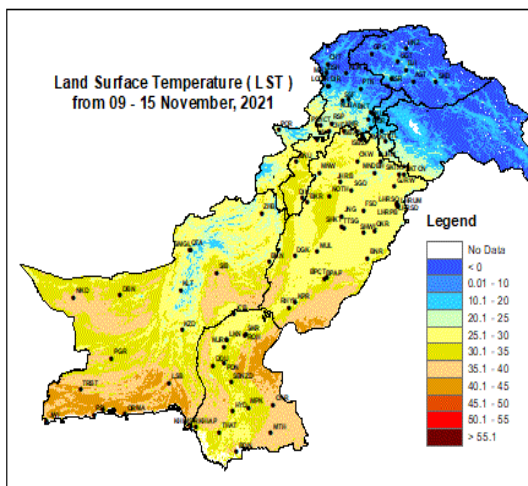


Figure 5: LST (°C) during 09-15 November, 2021

Land Surface Temperatures (LST) for the period 09 – 15 November, 2021 are represented by Fig. 5. In the central parts of the country, average daytime temperatures remained between 20°C to 25°C while at lower parts of the country, the temperature reaches above 30°C.

Land Surface Temperatures during the period 16 – 23 November are shown in Fig. 6. decreasing in temperatures has been observed in most parts of the country as compared to the previous week.

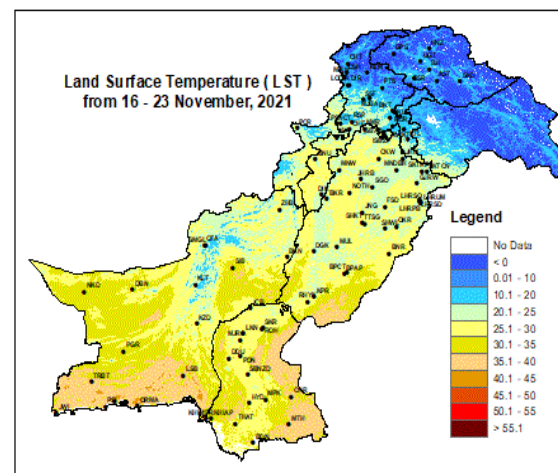
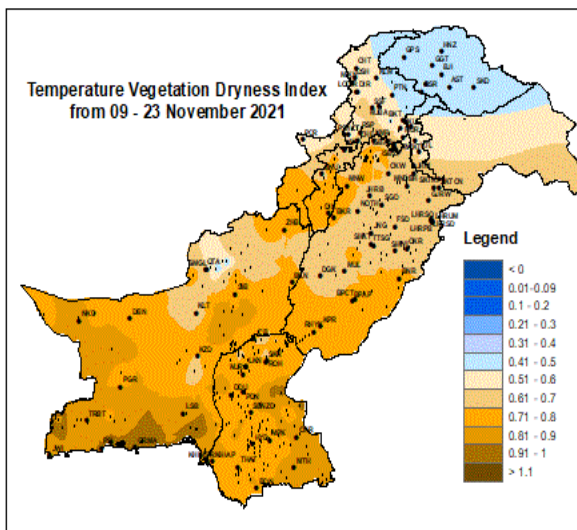


Figure 6: LST (°C) during 16- 23 November, 2021

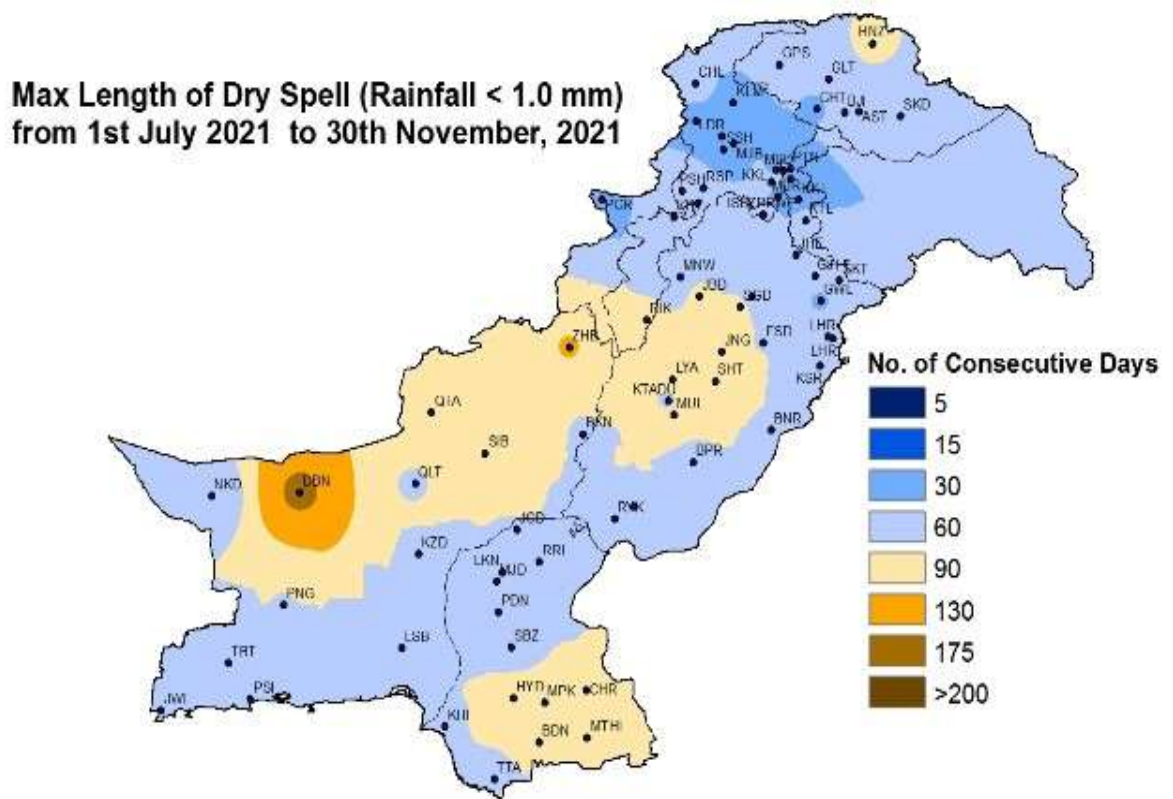
IV. Temperature Vegetation Dryness Index (TVDI)



Temperature Vegetation Dryness Index (TVDI) derived from MODIS product MOD13A2 (NDVI) and MOD11A2 (LST) is shown in Fig. 7, which indicates mild to moderate wet conditions in Gilgit Baltistan and adjoining areas of Khyber Pakhtunkhwa & Kashmir, while southern parts of Punjab, Sindh and Balochistan are under moisture stress conditions..

Figure 7: TVDI during 09 – 23 November 2021

V.Length of Consecutive Dry Days Spell



* Dry days means less than 1 mm rain

Source: National Drought Monitoring Center-PMD-Islamabad

3. Water availability/ Dams flow data:

During the month of November 2021, water inflow, outflow and level of Rawal, Khanpur, Tarbela and Mangla dams are shown in Fig.8 & 9. Decreasing trends have been observed in reservoir levels at Khanpur, Tarbela and Mangla dams.

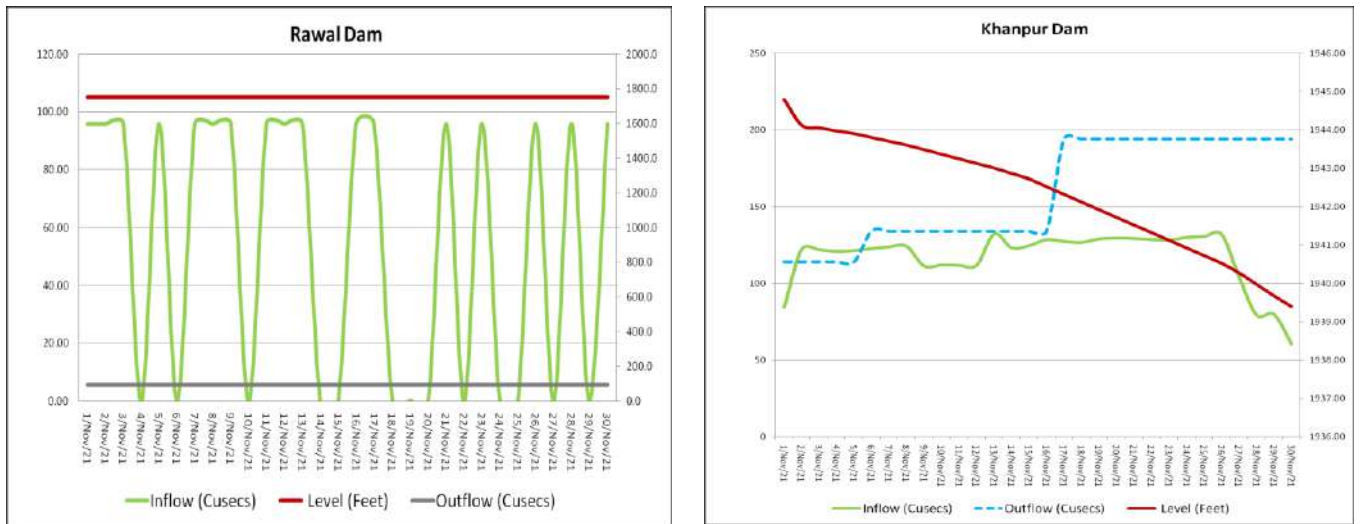


Figure 8: Water inflow, outflow and level of Rawal and Khanpur Dams

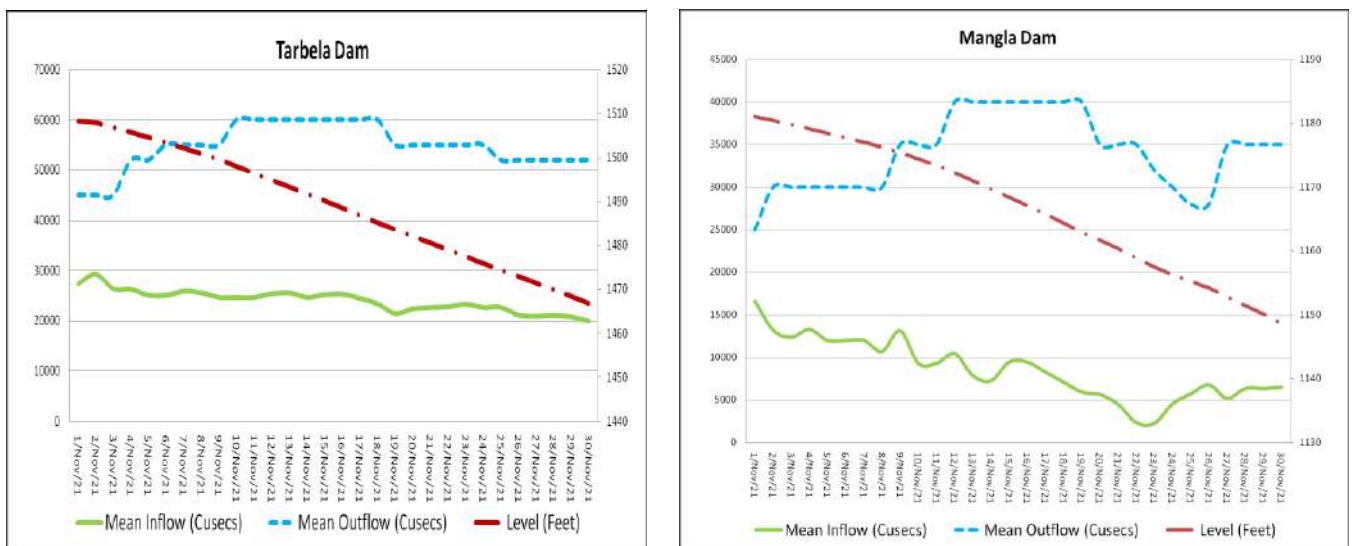


Figure 9: Water inflow, outflow and level of Tarbela and Mangla Dams

4. Weather outlook for December 2021

Two to Three western disturbances are likely to approach during the month, which may cause light to moderate rainfall at scattered places of Western, Central and Northern parts of the country. Second and fourth weeks are predicted to be wetter as compared to the rest of the days of the month. The snowfall is also likely to occur over high mountains in north Balochistan, Kashmir and Northern areas of Pakistan..

5. Drought Outlook for December 2021

The month of November was not good for most of the drought prone areas of Sindh and Balochistan..

In Balochistan, Districts Chagi, Kharan, Panjgor, Washuk and Kech are facing Moderate while Awaran and Quetta facing Mild Drought Conditions. In Sindh Province , Normal to wet conditions are observed.

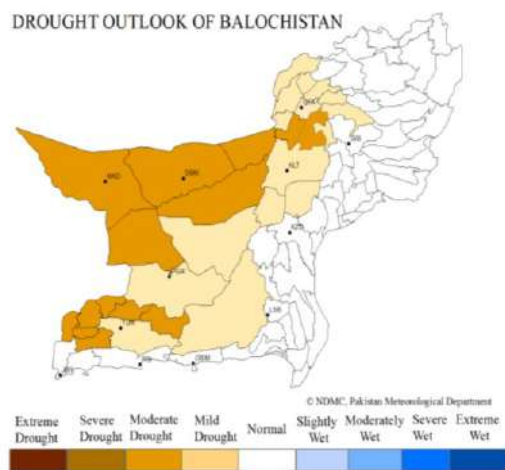


Fig-10: Conditions across Balochistan

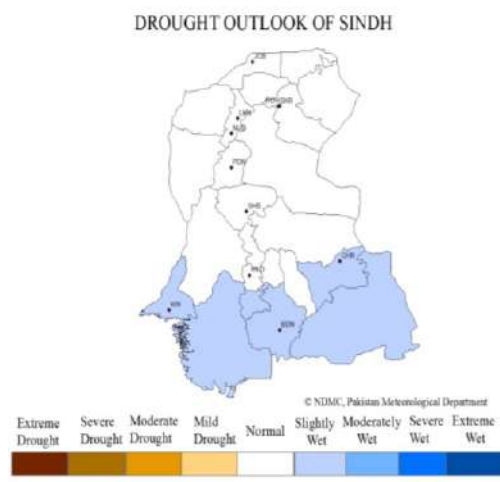
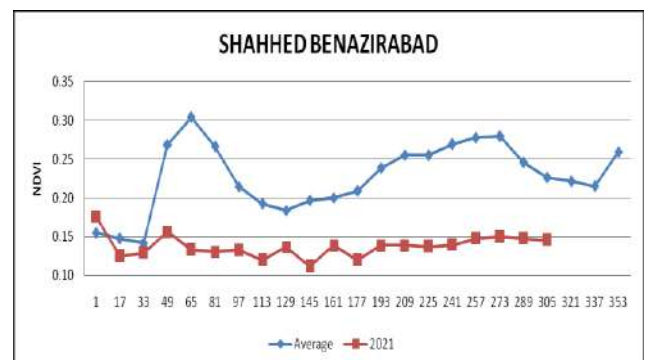
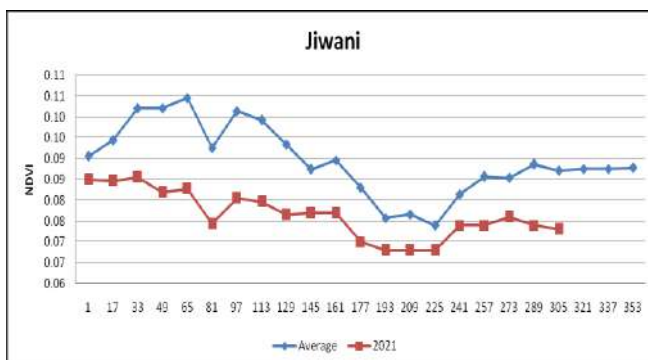
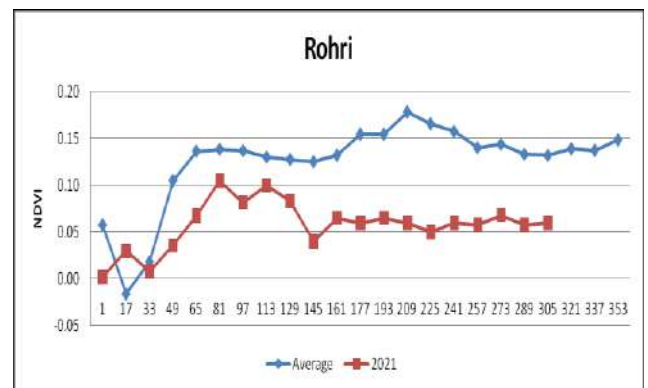
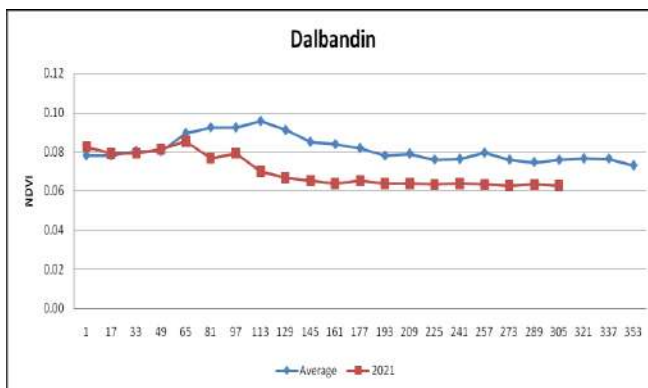
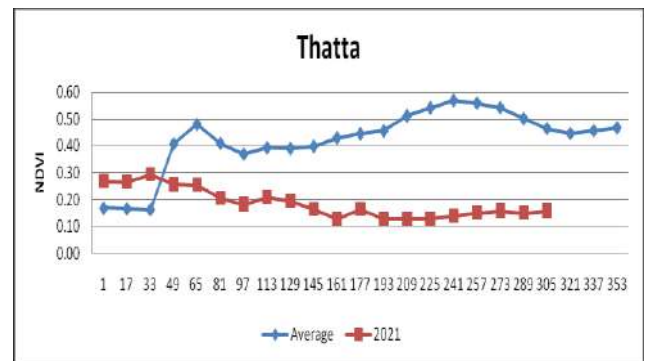
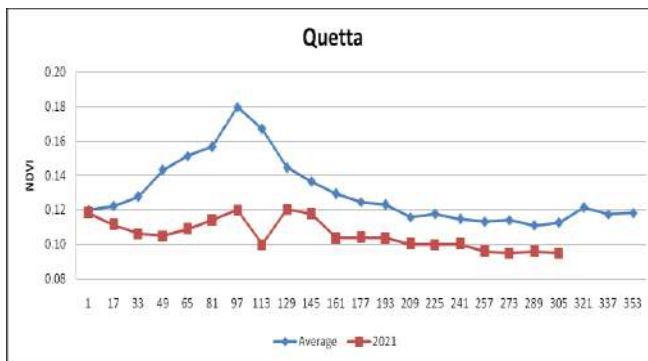


Fig:11 Drought Conditions across Sindh

Normalized Vegetation Index (NDVI) Comparison:



All stakeholders are requested to make all efforts to watch water availability situation across rain-fed areas of Balochistan especially in 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. Few Pest / insect attack has been reported in the media in some areas of Tharparkar, Khairpur and Dadu districts in Sindh so far.

7. Advice for Farmers:

- I. Farmers are advised to schedule the irrigation plans in accordance with the expected weather.
- II. Removing weeds from the standing crops is very important as weeds utilize moisture and food which are to be utilized by the crop.
- III. Farmers of cotton crop are advised to prepare field for incoming Rabi crops and complete sowing in time.

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