

OCTOBER 2021

Highlights

- Moderate to Heavy rainfall events were reported during the month of October 2021 at most of the places in Azad Jammu and Kashmir, Khyber Paktunkhawa, upper Punjab while rest of the country received light to moderate rainfall comprising Gilgit Baltistan, Sindh and isolated areas in Blochistan. The Chief amounts of monthly rainfall recorded across Pakistan during the month of October, 2021 are shown in Table:1.
- During the month of November 2021, Near Normal precipitation is expected over the country. Normaly, November is a dry month over Pakistan. Northern parts of Punjab and Khyber Paktunkhawa may receive some precipitation due to westerly troughs passing across the area.
- Precipitation during the month of October 2021 was good enough for most of the drought prone areas of Sindh, while areas in Balochistan are still under moisture stress.
- 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.

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

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1. Weather Summary for the month of October, 2021

During the month of October 2021, rainfall received across Pakistan is shown in Fig.1. Moderate to Heavy rainfall events were reported at most of the places in Azad Jammu and Kashmir, Khyber Paktunkhawa, upper Punjab while rest of country received light to moderate rainfall comprising Gilgit Baltistan and isolated areas in Sindh and Blochistan. The Chief amounts of monthly rainfall recorded across Pakistan during October, 2021 is shown in Table:1

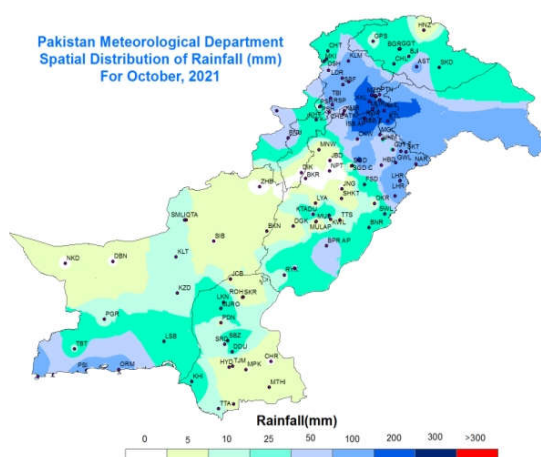


Figure 1: Rainfall distribution for the month of October-2021

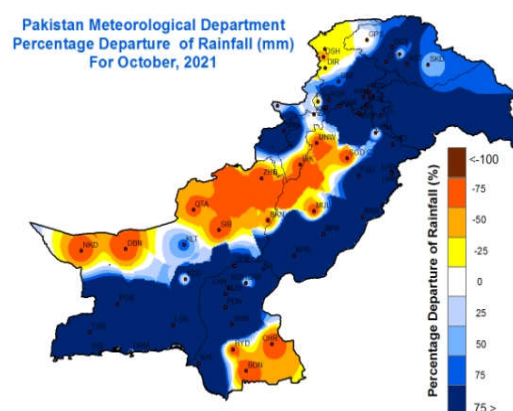


Figure 2: Percentage Departure of Rainfall for the month of October-2021

The Fig. 2 depicts the Percentage Departure of Rainfall from the normal. Above Normal rainfall was received in most areas of GB eastern Punjab, Sindh and Balochistan while yellow and orange colour on the map received below normal rainfall.

S. No.	Stations	Rainfall (mm)	S. No.	Stations	Rainfall (mm)
1	Chaklala Airbase	257.8	11	Rawalakot	117.6
2	Chakothei	199.1	12	Mandibahauddin	117.5
3	Pashat-Bajaur	198.0	13	Dhulli	116.0
4	Balakot	171.0	14	Kotli	111.0
5	Haraman	157.4	15	Tandali	108.1
6	Kakul	152.7	16	Narowal	97.6
7	Chattar Kalas	139.9	17	Muzaffarabad Airport	81.8
8	Murree	129.5	18	Jiwani	78.0
9	Garhi Dupatta	126.5	19	Buner	77.6
10	Shahdara	119.0	20	Risalpur	77.2

2. Drought Situation Analysis

Spatial drought analysis results using different indices are represented in Fig. 3. In Balochistan, Districts Chagi, 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 the previous two months, Drought conditions have become normal, whereas districts like Karachi, Tharparkar, Badin, Chhor and adjoining areas are showing slightly wet conditions. .

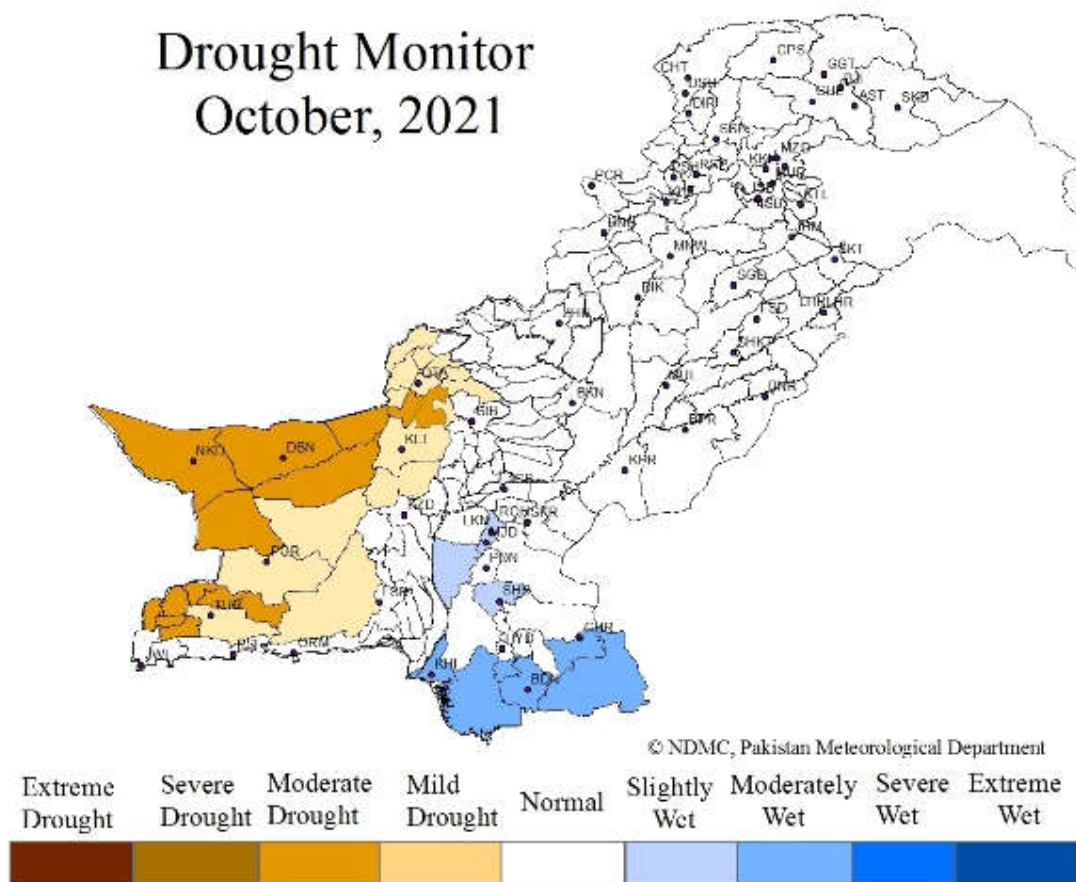
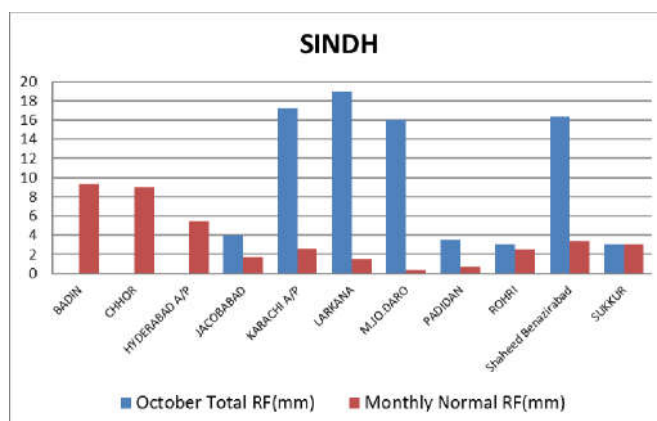
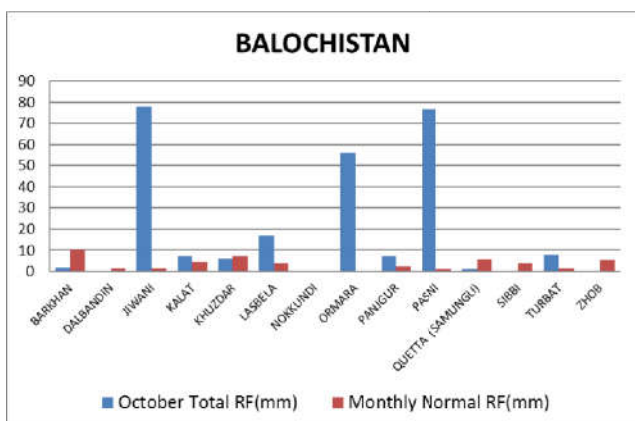
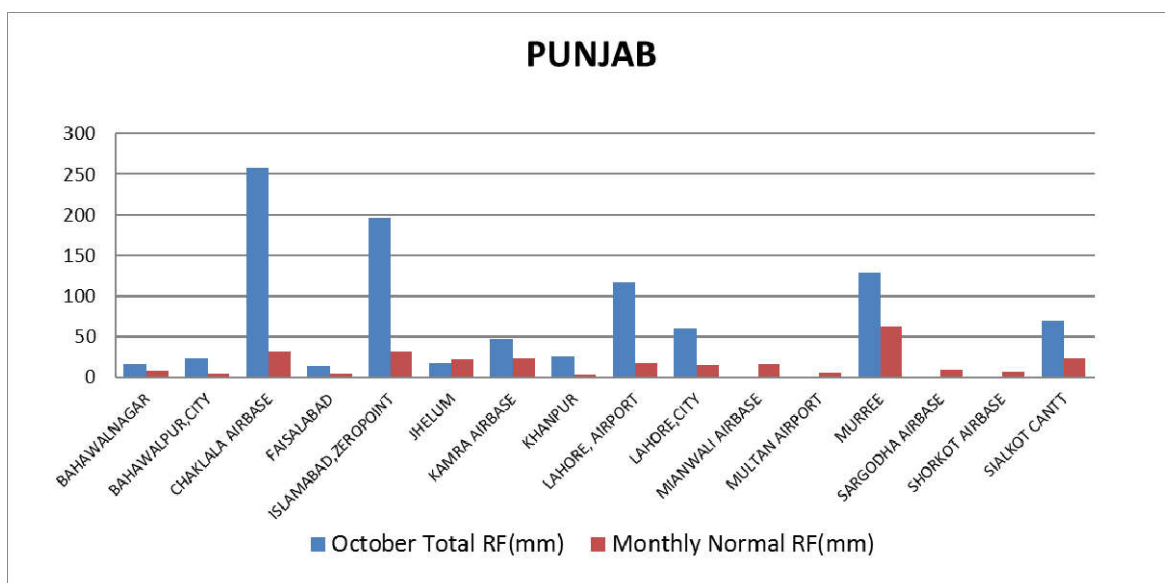
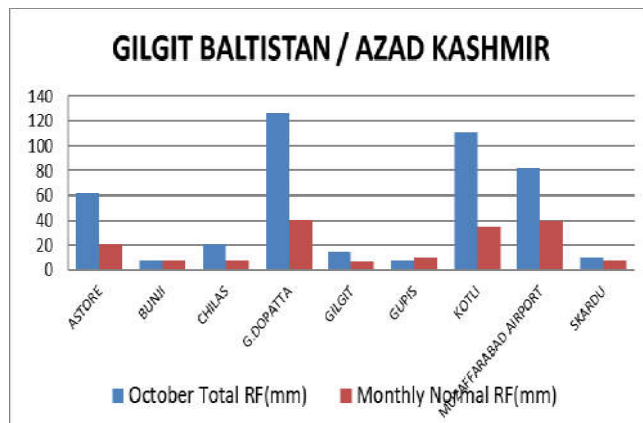
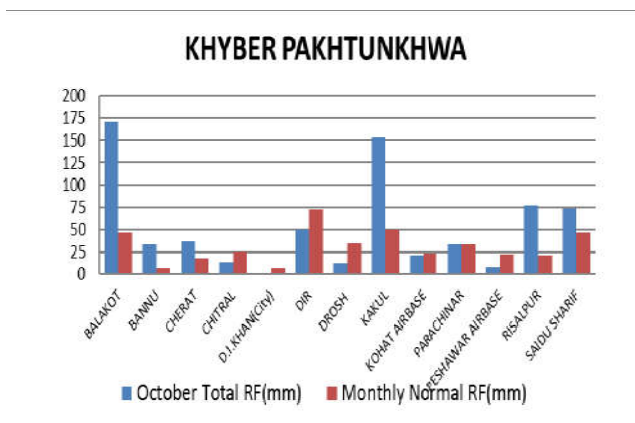


Figure 3: Analysis for Drought conditions of Pakistan

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



II. Normalized Difference Vegetation Index (NDVI)

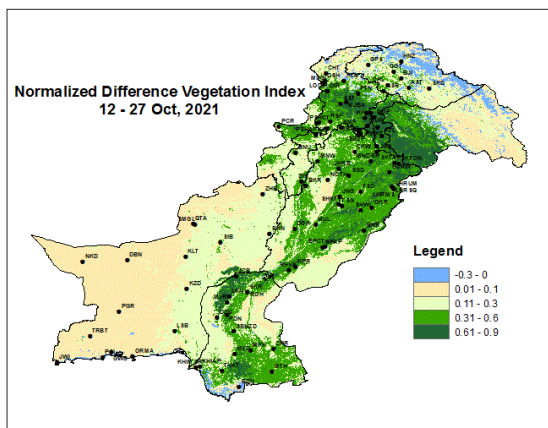


Figure 4: NDVI during 12 to 27 Oct, 2021

Normalized Difference Vegetation Index values for the month of October 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)

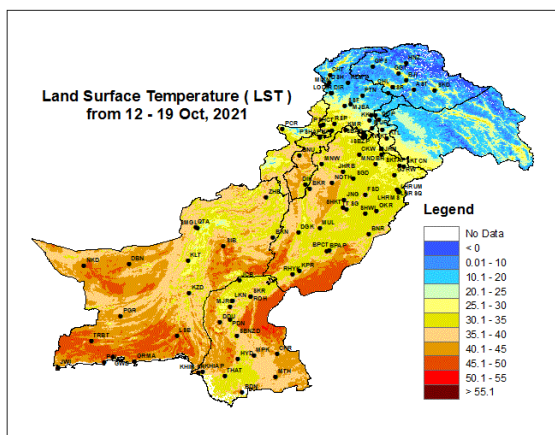


Figure 5: LST (°C) during 12-19 October, 2021

Land Surface Temperatures (LST) for the period 10–17 October, 2021 are represented by Fig. 5. In the central parts of the country, average daytime temperatures remained between 25°C to 30°C while at lower parts of the country, the temperature reaches above 40°C.

LandSurface Temperatures during the period 20 – 27 October are shown in Fig. 6. decrease in nighttime temperatures has been observed in most parts of the country as compared to the previous week.

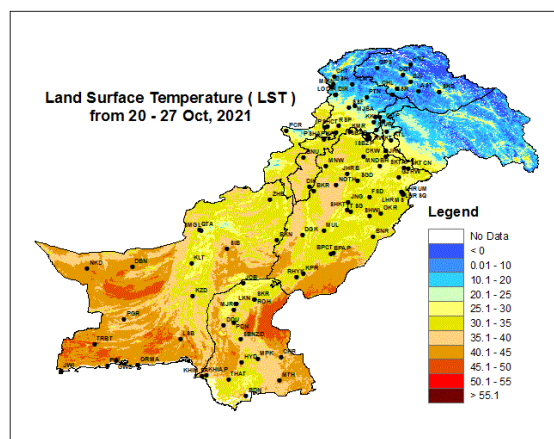
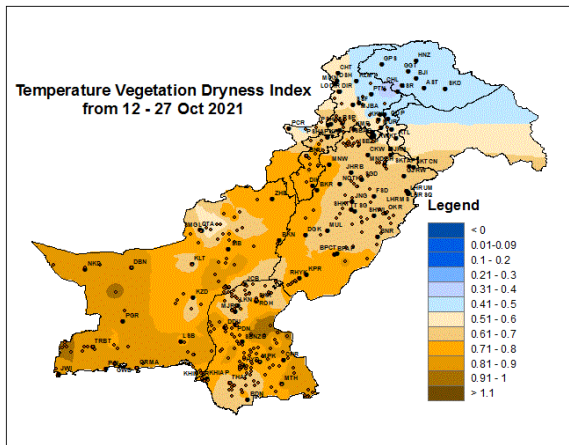


Figure 6: LST (°C) during 20 - 27 Oct, 2021

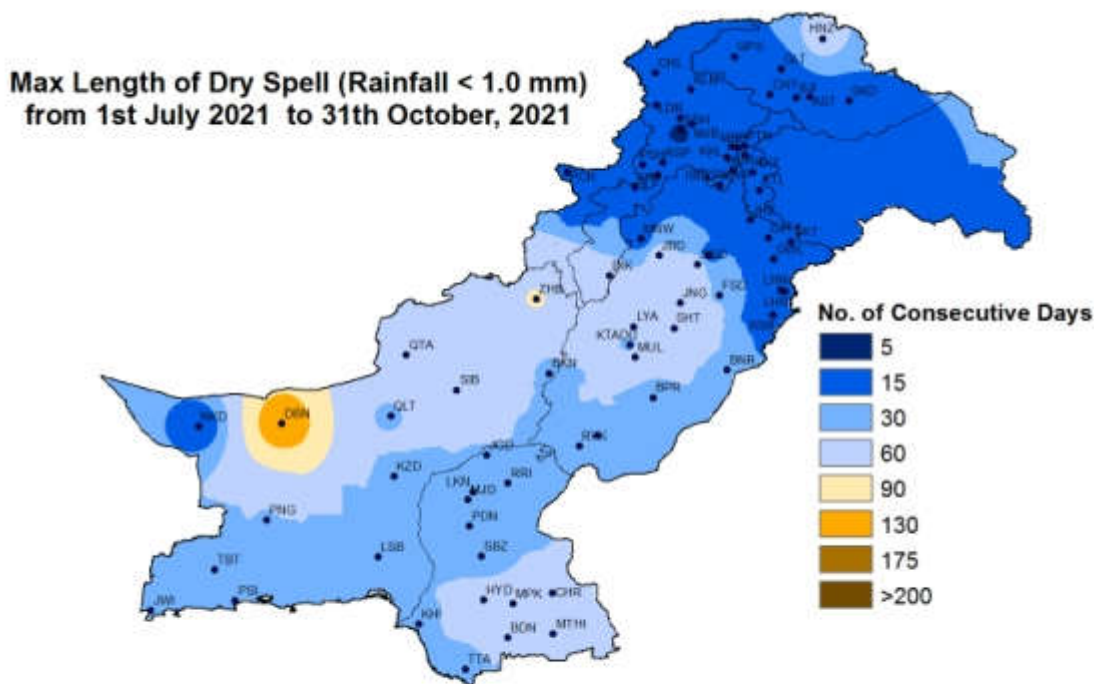
IV. Temperature Vegetation Dryness Index (TVDI)



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 western parts of Balochistan are under moisture stress conditions..

Figure 7: TVDI for period 12 - 27 Oct-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 October 2021, water inflow, outflow and level of Rawal, Khanpur, Tarbela and Mangla dams are shown in Fig.8 & 9. An increasing and then decreasing trends in inflow has been observed in Khanpur and Mangla dams.

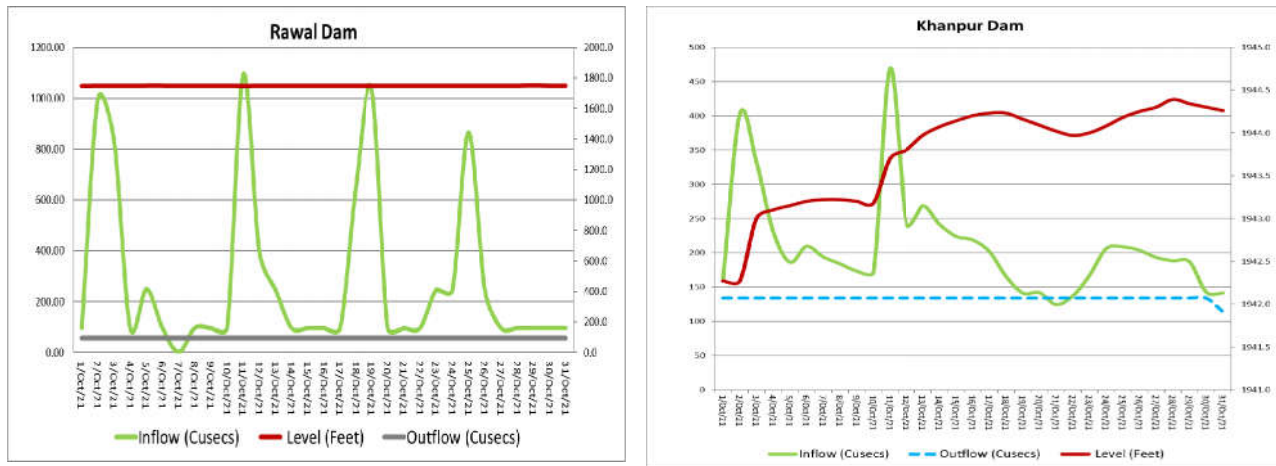


Figure 8: Water inflow, outflow and level of Rawal and Khanpur Dams

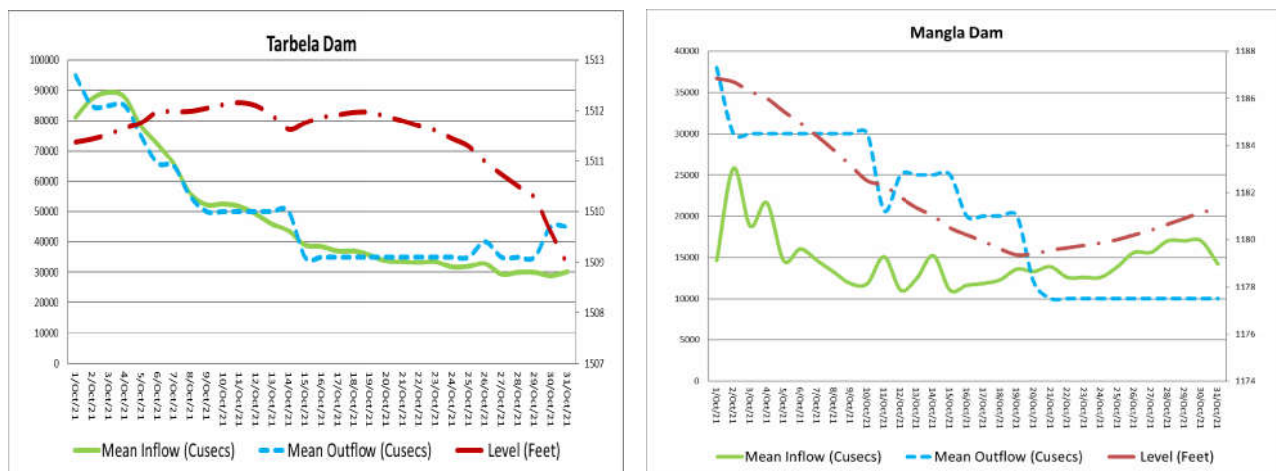


Figure 9: Water inflow, outflow and level of Tarbela and Mangla Dams

4. Weather outlook for November 2021

November is a dry month normally, over Pakistan. Northern parts of Punjab and Khyber Paktunkhawa may receive some precipitation due to westerly troughs passing across the area. Over rest of the agricultural plains of the country, generally, weather would remain dry during the month of November. Due to shorter days, lower solar intensities as compared with those during October, some freezing nights in the later parts of the month are expected over high agricultural plains of Balochistan.

5. Drought Outlook for November 2021

The month of October was good for most of the drought prone areas of Sindh and some area in Balochistan as well giving temporary relief there. 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.

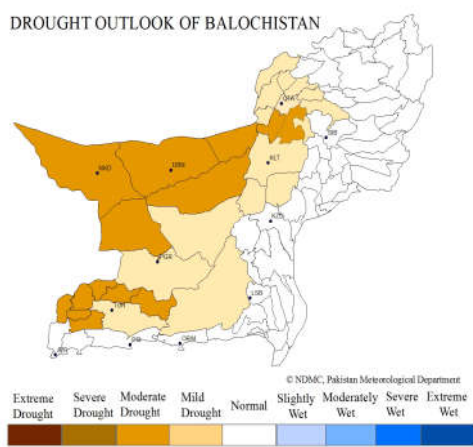


Fig-10: Conditions across Balochistan

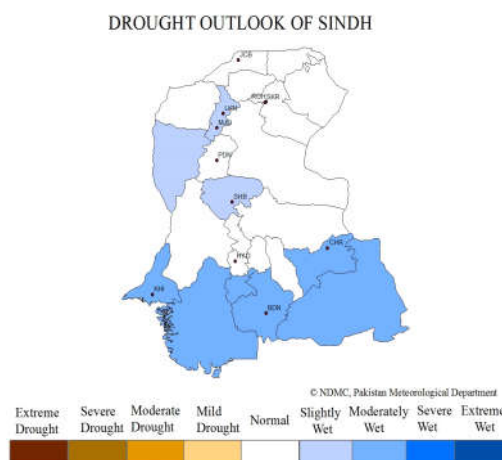
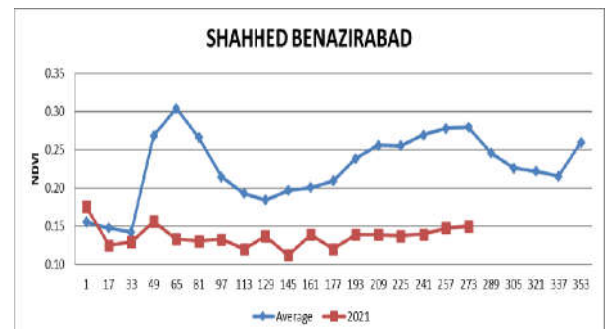
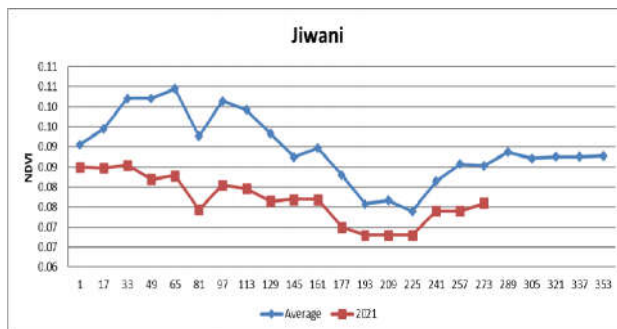
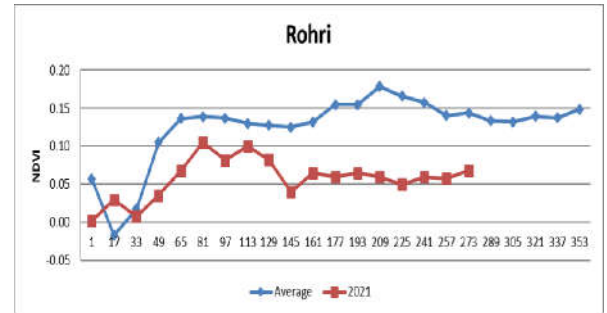
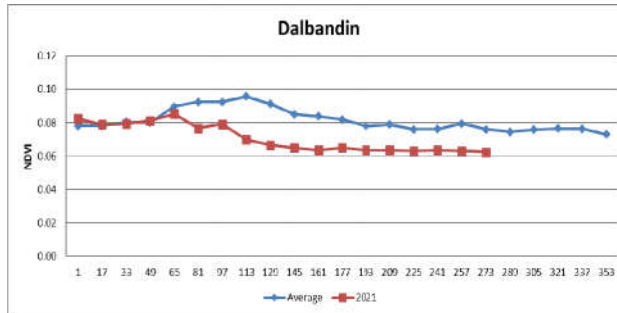
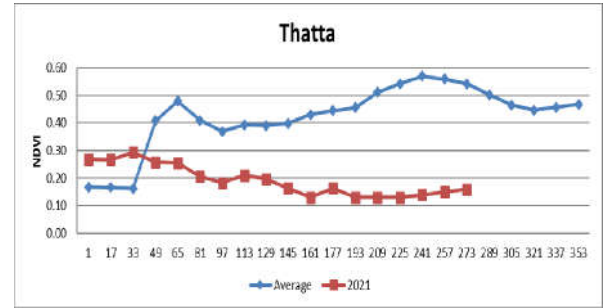
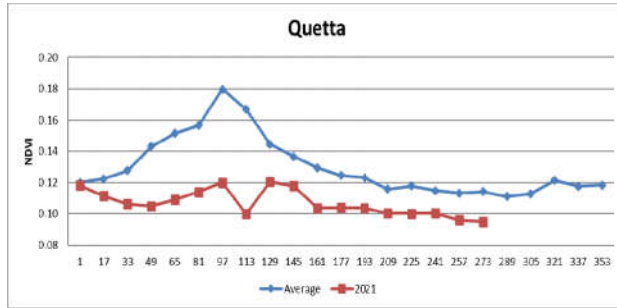


Fig:11 Drought Conditions across Sindh

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:

Harvesting of Kharif crops is in full swing, which include crops like Millet (local name Bajra), Sorghum (local name Jowar), Maize, Mung bean, sugar-cane, Peanut, Sunflower, Soybean, rice, cotton etc. Condition of rice is satisfactory. Sowing of Rabi crops has been started at some places.

7. Advice for Farmers:

- I. Farmers of wheat growing areas are advised to sow their crops in time to get the optimum yield. The best suitable time for wheat cultivation is 1st November to 20th November.
- II. Wheat cultivation is in progress in most of the rain-fed areas. Farmers of rain-fed areas are advised to sow their crops before 15th November to get maximum yield. After this time the yield of wheat crop may decrease gradually.
- III. Farmers of rain-fed areas are advised to sow wheat crop by keeping in mind the above mentioned weather conditions during the current decade.
- IV. Farmers of irrigated areas are advised to harvest Kharif crops, including cotton well in time so that timely sowing of Rabi crops, especially wheat crop may be possible without any delay.

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