

DECEMBER 2021

Highlights

- Very Light to moderate rainfall events were reported during the month of December 2021 at most of the places in all the provinces of Pakistan including Azad Jammu and Kashmir, The Chief amounts of monthly rainfall recorded across Pakistan during the month are shown in Table:1.
- Precipitation during the month of December 2021 was not good enough for most of the drought prone areas of Sindh and Balochistan which are still under moisture stress.
- During the month of January 2022, Normal precipitation is expected over the country, while Northern parts of the country, upper KP, Gilgit Baltistan and Azad Jammu & Kashmir may get slightly above normal rainfall with snowfall over the mountains. Southern Punjab, Sindh and Balochistan is expected to receive slightly below normal rainfall.
- 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

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1. Weather Summary for the month of December, 2021

During the month of December 2021, reported rainfall is shown in Fig.1. Light to moderate rainfall was received at most of the places in all the provinces of Pakistan including Azad Jammu and Kashmir. The Chief amounts of monthly rainfall recorded across Pakistan during December, 2021 is shown in Table:1

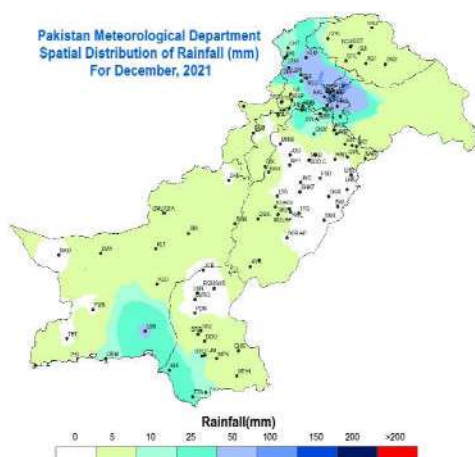


Figure 1: Rainfall distribution for the month of December, 2021

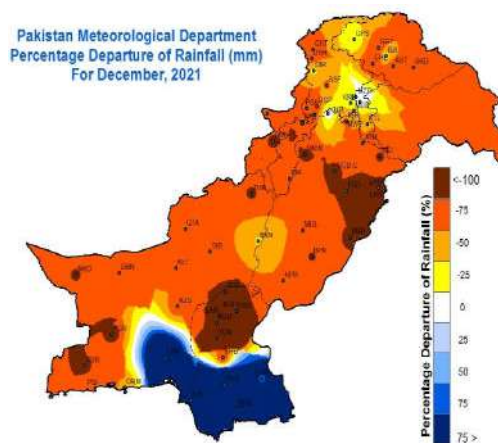


Figure 2: Percentage Departure of Rainfall for the month of December, 2021

The Fig. 2 depicts the Percentage Departure of Rainfall from the normal. Below Normal rainfall was received in most of the areas of the country. Blue colour shows above normal rainfall areas since normal values of rainfall are very low over there.

Table-1: The Chief amounts of rainfall recorded across Pakistan during the month of December, 2021

S. No.	Stations	Rainfall (mm)	S. No.	Stations	Rainfall (mm)
1	Deolian (AJK)	83.6	11	Pashat-Bajaur (KP)	40.4
2	Tandali (AJK)	74.3	12	Kalam	33.2
3	Garhi Dupatta	72.5	13	Rawalakot	30.2
4	Chattar Kalas (AJK)	60.8	14	Pattan	29.0
5	Muzaffarabad Airport	60.0	15	Murree	28.1
6	Malam Jabba	52.0	16	Karachi	27.0
7	Haraman (AJK)	50.2	17	Chakothi (AJK)	26.1
8	Balakot	48.0	18	Lasbela	26.0
9	Dir	44.0	19	Dhulli (AJK)	20.5
10	Kakul	41.5	20	Kamra Airbase	20.4

2. Drought Situation Analysis

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

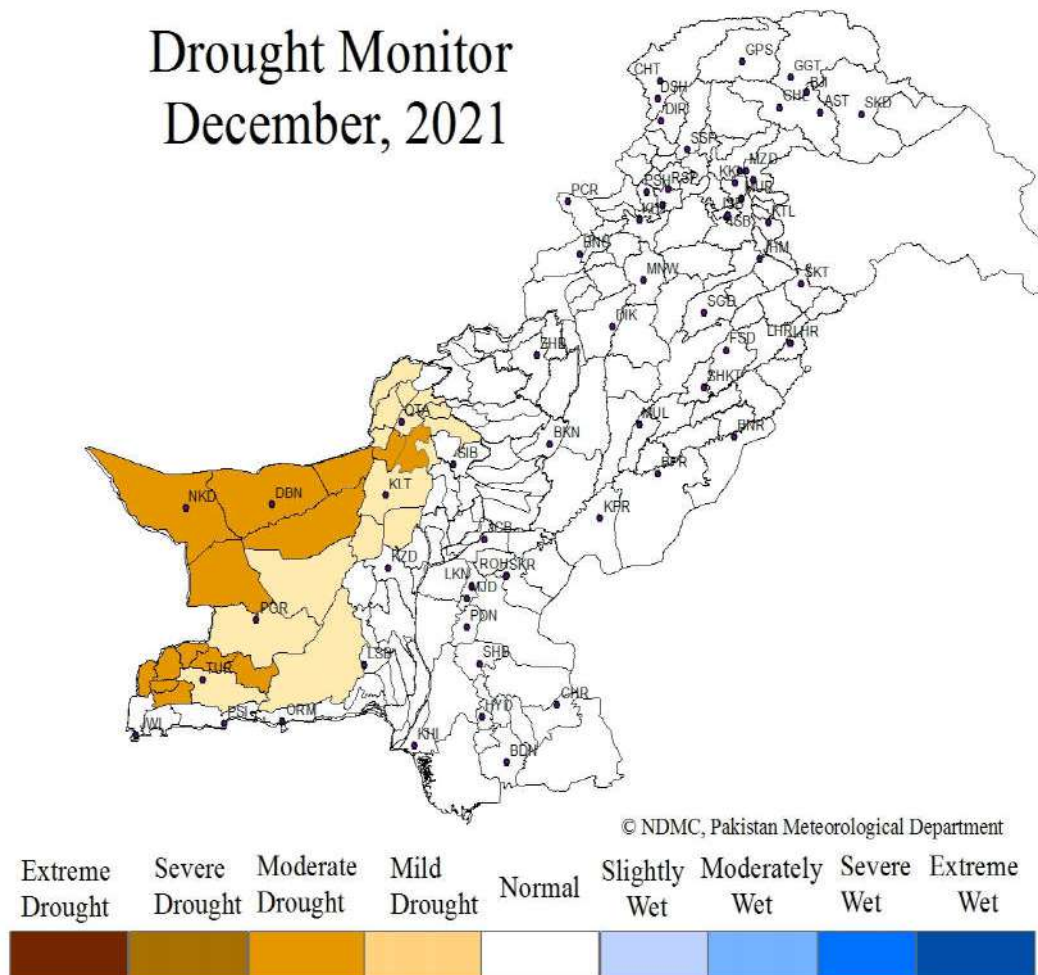
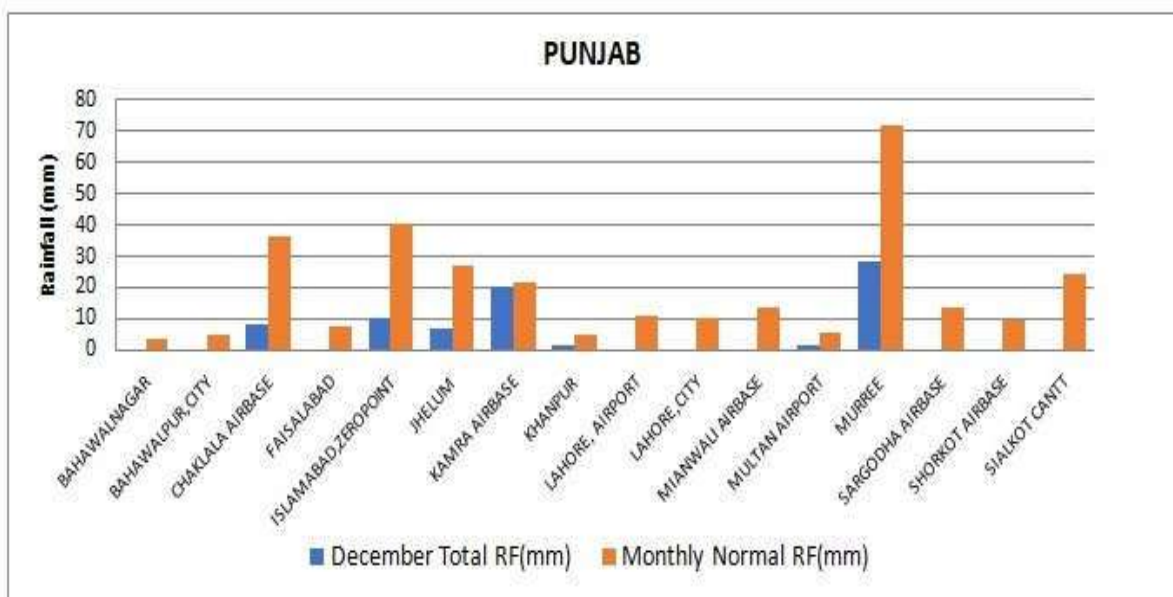
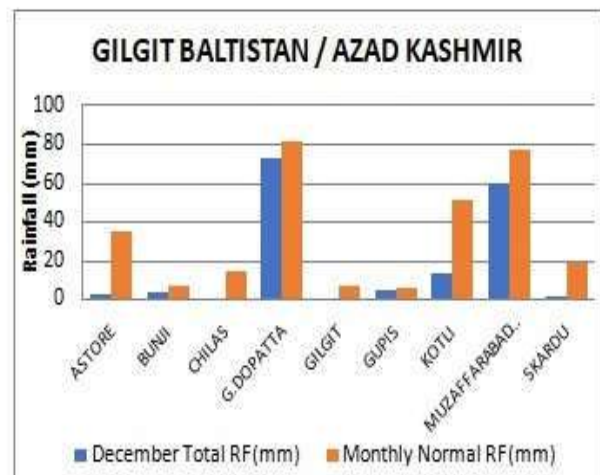
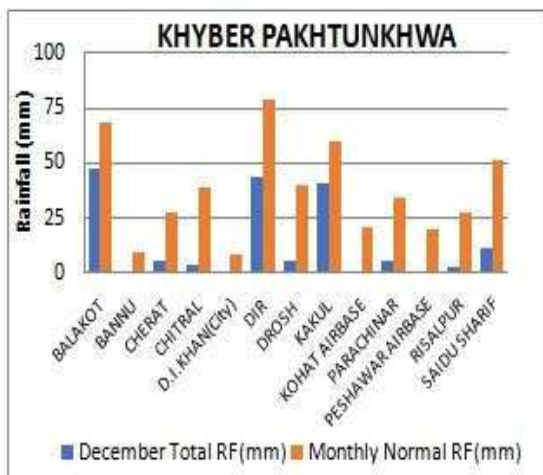
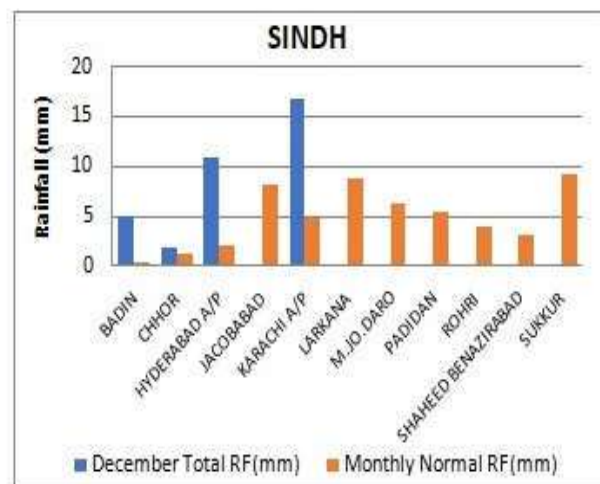
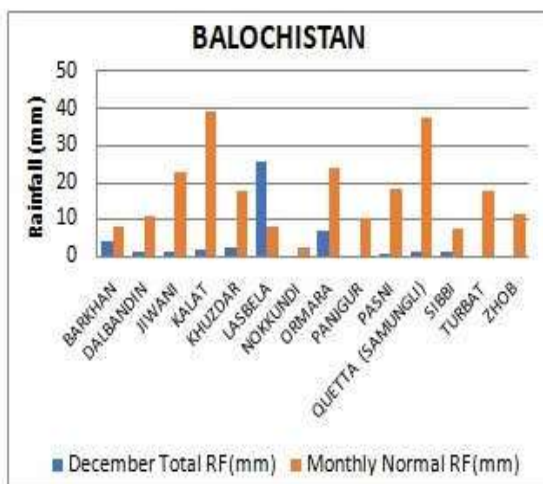


Figure 3: Analysis for Drought conditions of Pakistan

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



II. Normalized Difference Vegetation Index (NDVI)

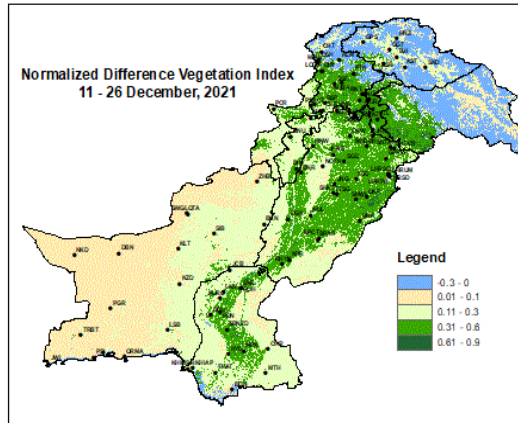


Figure 4: NDVI during 11 – 26 December, 2021

Normalized Difference Vegetation Index values for the month of December 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)

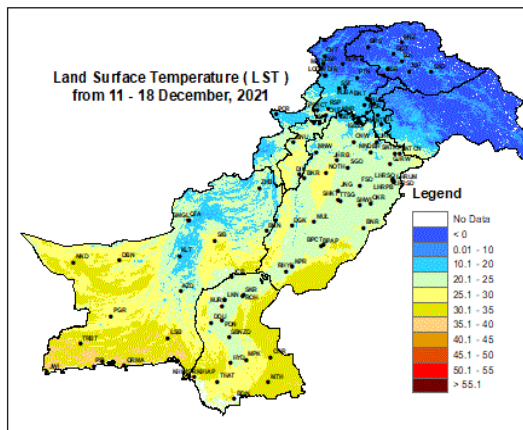


Figure 5: LST (°C) during 11-18 December, 2021

Land Surface Temperatures during the period 19 – 26 December are shown in Fig. 6. Decrease in temperatures has been observed in most parts of the country as compared to the previous week.

Land Surface Temperatures (LST) for the period 11 – 18 December, 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.

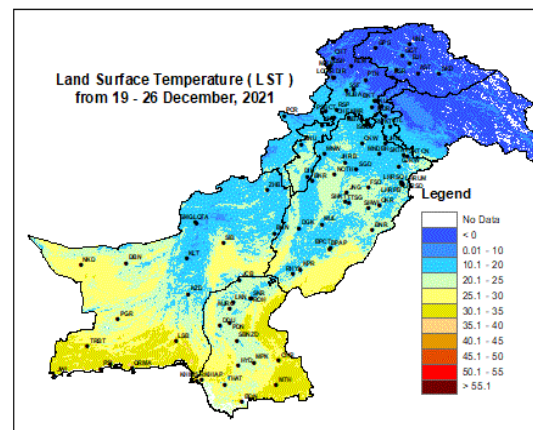


Figure 6: LST (°C) during 19 - 26 December, 2021

IV. Temperature Vegetation Dryness Index (TVDI)

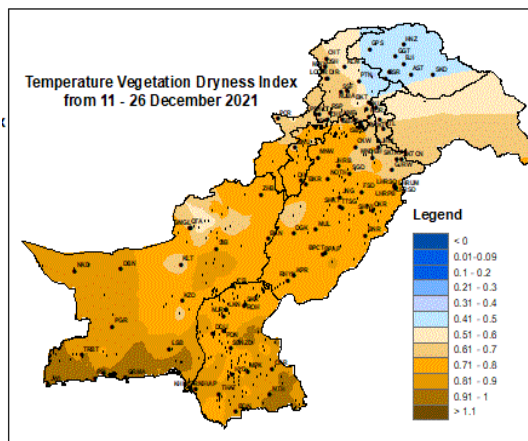
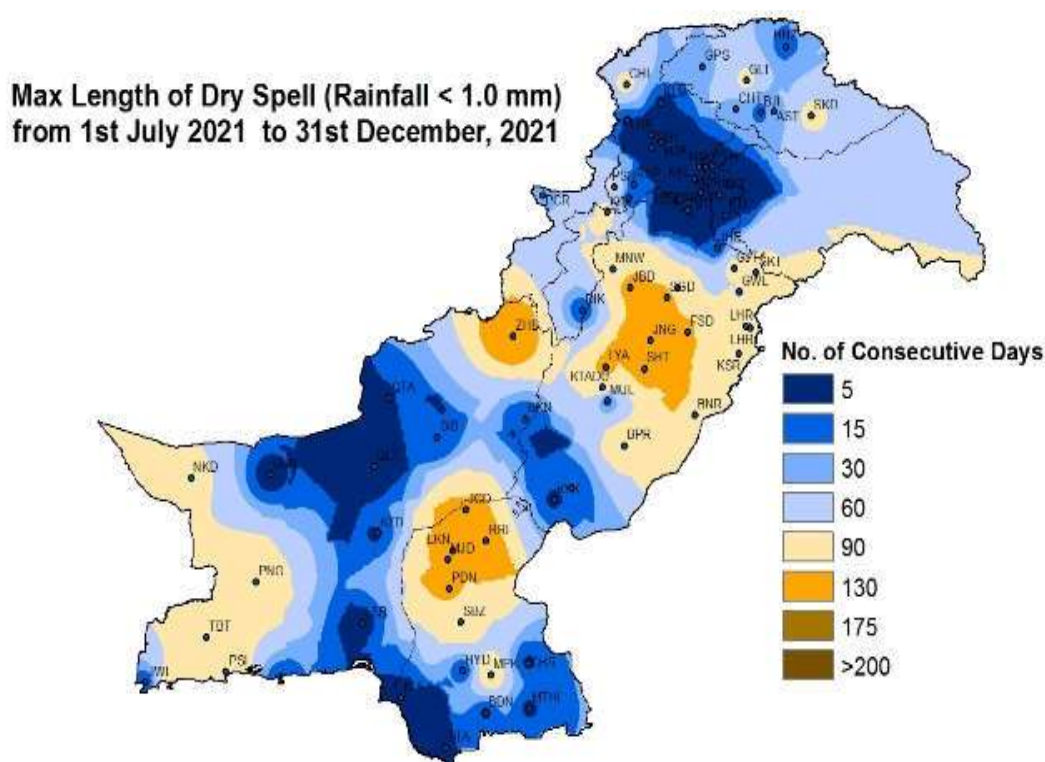


Figure 7: TVDI during 11 – 26 December 2021

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..

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 December 2021, water inflow, outflow and level of Rawal, Khanpur, Tarbela and Mangla dams are shown in Fig.8 & 9. Decreasing trends has been observed in resevoir levels of all the four dams.

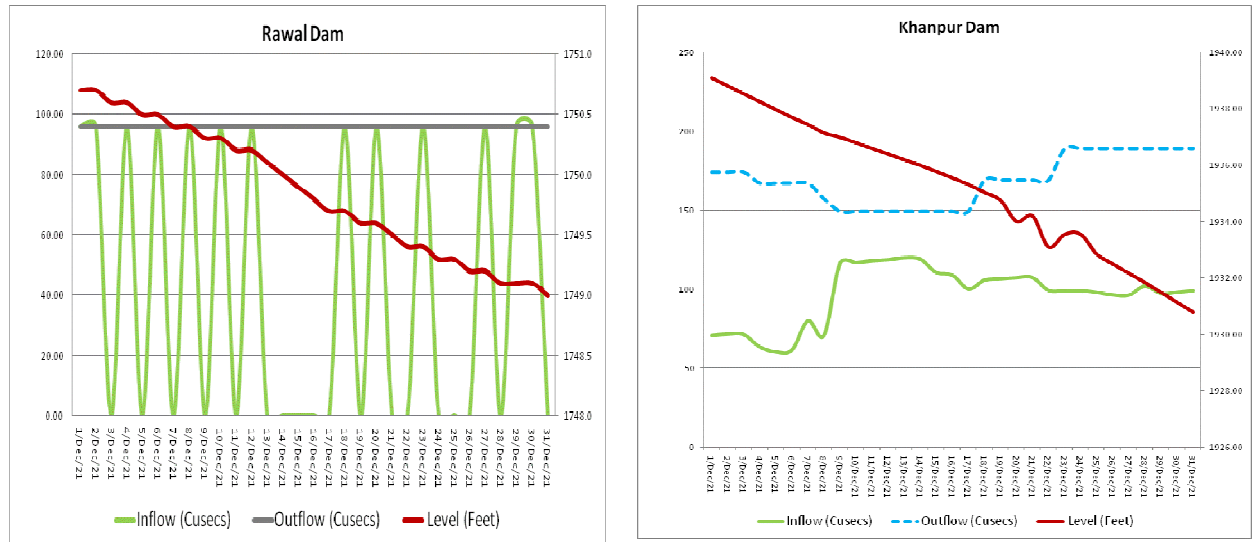


Figure 8: Water inflow, outflow and level of Rawal and Khanpur Dams

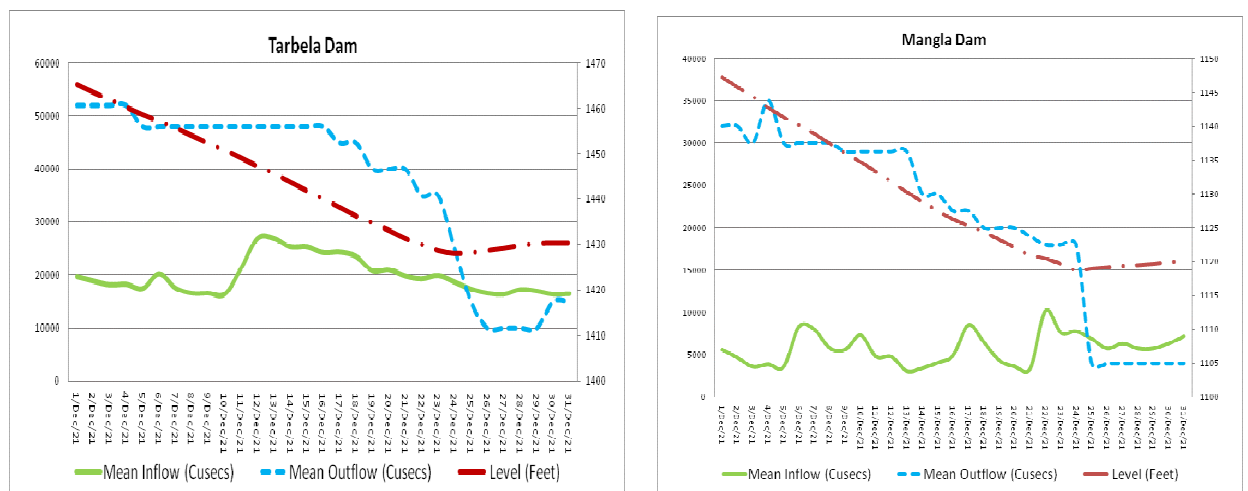


Figure 9: Water inflow, outflow and level of Tarbela and Mangla Dams

4. Weather outlook for January, 2022

Winter rains in Pakistan region during January are associated with Westerly Waves and frontogenesis processes taking place at mid latitudes. Overall normal rainfall is likely to occur all over the country. However, Northern parts of the country including upper KP, Gilgit Baltistan and Azad Jammu & Kashmir may get slightly above normal rainfall with snowfall over the mountains. Southern Punjab, Sindh and Balochistan is expected to receive slightly below normal rainfall. Nights will become cooler and frost can be observed in the early morning.

5. Drought Outlook for January, 2022

The month of December was slightly good for some of the drought prone areas of Sindh and Balochistan. *In Balochistan province, Districts of Chagai, Kharan, Panjgur, Washuk and Kech are facing Moderate while Awaran and Quetta facing Mild Drought Conditions while in Sindh Province , Normal to wet conditions are observed.*

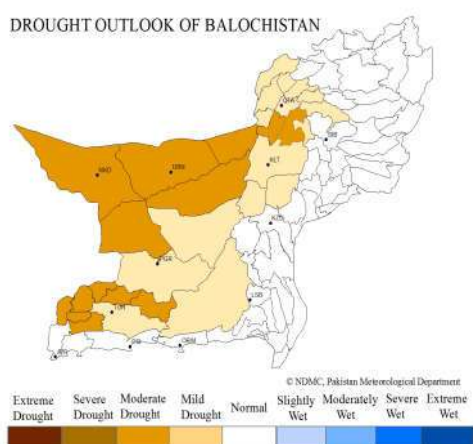


Fig-10: Drought Conditions across Balochistan

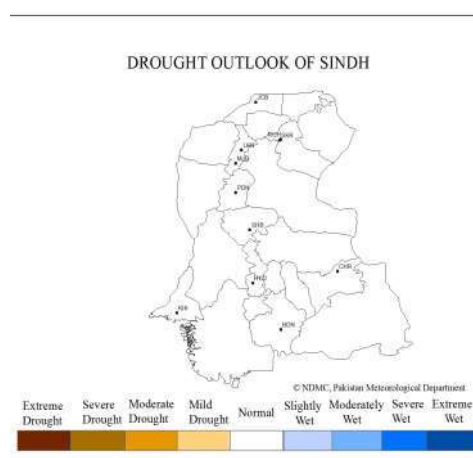


Fig-11 Drought Conditions across Sindh

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:

The sowing of Rabi crops in Pakistan stretches from mid September to the end of December. The night temperatures possesses a special significance, when they drop below freezing level (0°C) that would result in drop of temperatures in agricultural plains and produce frost, if protection measures are not taken, the frost may kill the crop plants and even sometimes badly affects their yield.

7. Advice for Farmers:

- I. In the rainfed plains of Balochistan and Potohar Plateau, the farmers have to show an efficient rain water harvest skill for their crops.
 - II. Farmers of rainfed areas, obtaining crop water through tube wells are advised to schedule the irrigation according to the expected weather.
 - III. Removing weeds from standing crops is very important as weeds utilize moisture, which should be utilized by the crop.
 - IV. Due to further drop of temperatures, especially farmers of upper areas of the country are advised to protect their crops from the coming season of frost.
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