

SEPTEMBER 2021

Highlights

- Moderate to Heavy rainfall events were reported for the month of September 2021 at most of the places in Azad Jammu and Kashmir, Khyber Paktunkhawa, upper Punjab and Sindh while rest of the country received light to moderate rainfall comprising Gilgit Baltistan and isolated areas in Blochistan. The Chief amounts of monthly rainfall recorded across Pakistan during the month are shown in Table:1.
- During the month of October 2021, Near Normal precipitation is expected over the country. Temperature and humidity levels during October may favour the outbreak of Dengue Epidemic. In this regard, PMD has issued Dengue Alert-I for the concerned authorities (Annex-I).
- Precipitation during the month of September 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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Table of Contents

S.No.	Contents
1	Weather Summary of the period
2	Drought Situation Analysis <ul style="list-style-type: none">I. Normal and Actual Monthly Rainfall ComparisonII. Normalized Difference Vegetation Index (NDVI)III. Land Surface Temperature (LST)IV. Temperature Vegetation Index (TVDI)V. Length of Consecutive Dry Days Spell
3	Water availability/ Dams flow data
4	Weather outlook for October, 2021
5	Drought Outlook for October, 2021
6	Crop Condition
7	Advice for Farmers
8	Dengue Alert-I

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1. Weather Summary for the month of September, 2021

During the month of September 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 and Sindh while rest of the country received light to moderate rainfall comprising Gilgit Baltistan and isolated areas in Blochistan. The Chief amounts of monthly rainfall recorded across Pakistan during September, 2021 is shown in Table:1

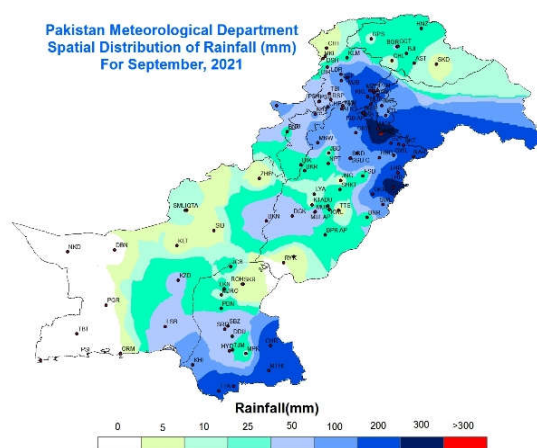


Figure 1: Rainfall distribution for the month of September-2021

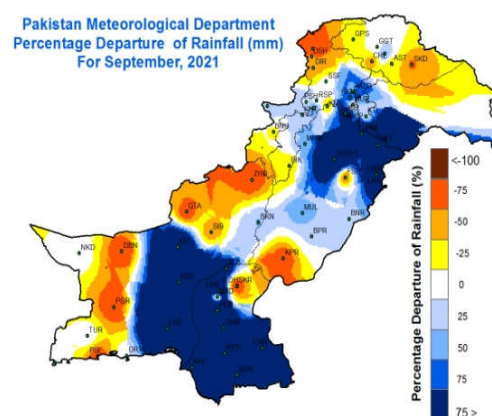


Figure 2: Percentage Departure of Rainfall for the month of September-2021

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

S. No.	Stations	Rainfall (mm)	S. No.	Stations	Rainfall (mm)
1	Lahore	440.0	11	Chhor	174.9
2	Jhelum	323.9	12	Garhi Dupatta	174.2
3	Kasur	282.0	13	Muzaffarabad Airport	168.8
4	Chaklala Airbase	253.8	14	Mithi	164.2
5	Mangla	201.9	15	Balakot	148.6
6	Brarkot	187.1	16	Badin	144.7
7	Sialkot Airport	185.5	17	Narowal	135.9
8	Kakul	185.0	18	Malam Jabba	134.2
9	Mangla	183.9	19	Buner	121.1
10	Gujrat	179.4	20	Thatta	120.0

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 recent weeks, Drought conditions have become normal, whereas districts like Karachi, Tharparkar, Badin, Chhor and adjoining areas are showing slightly wet conditions. .

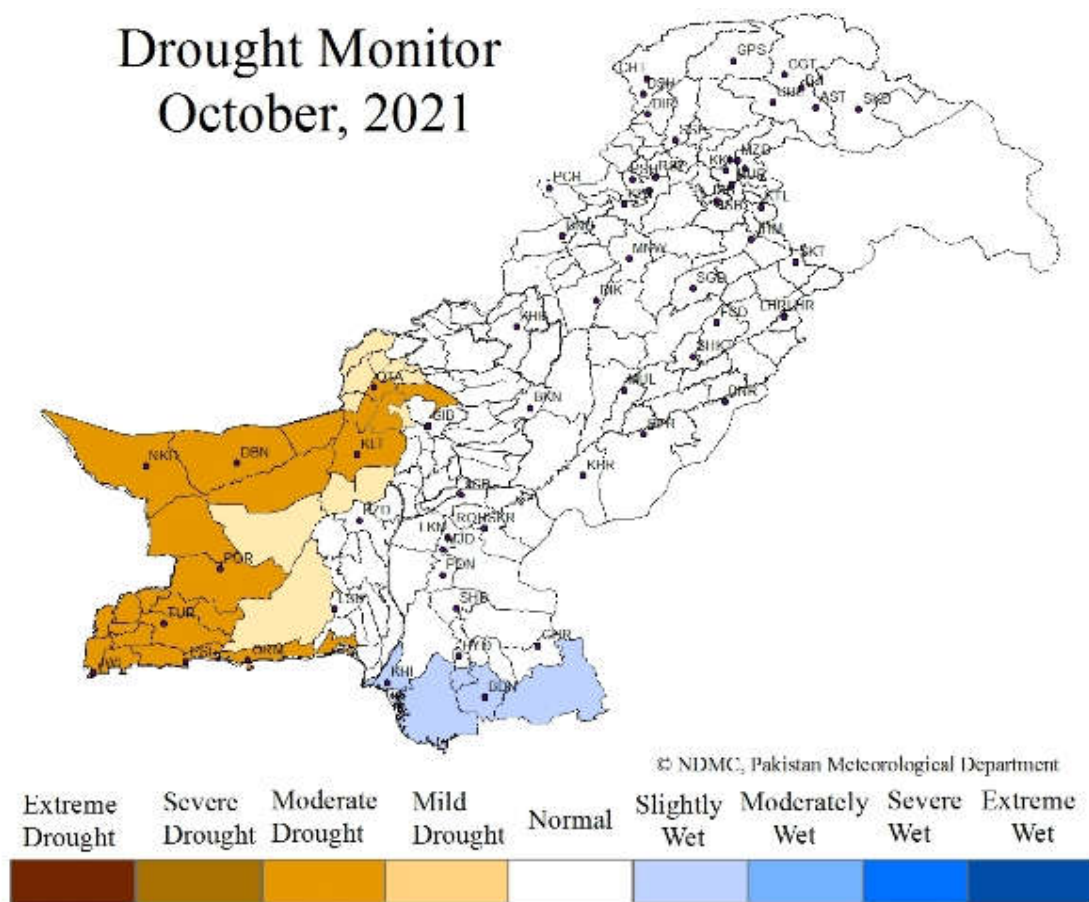
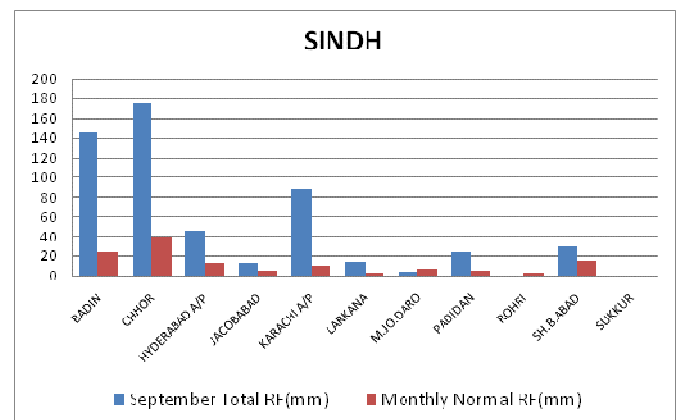
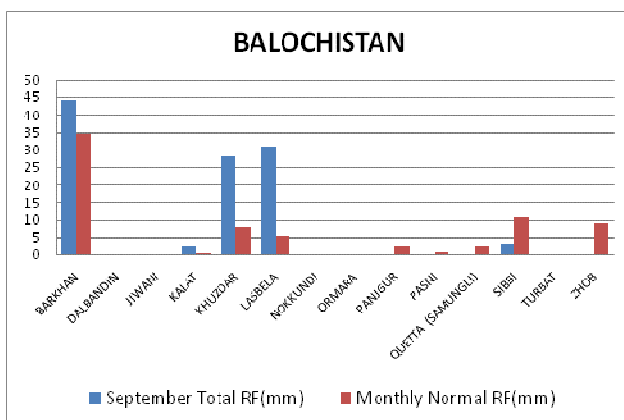
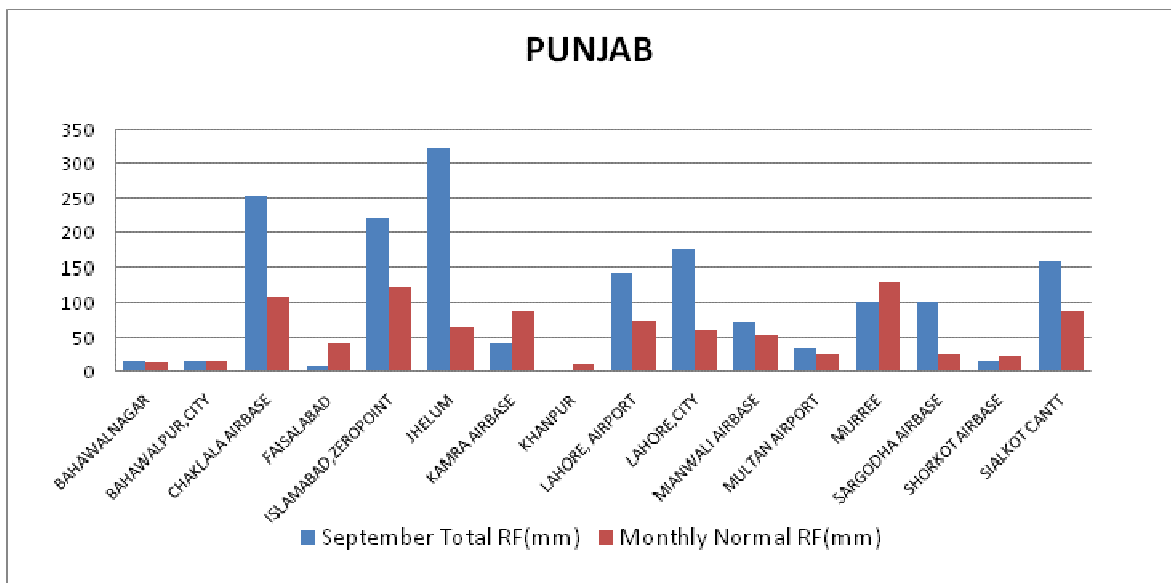
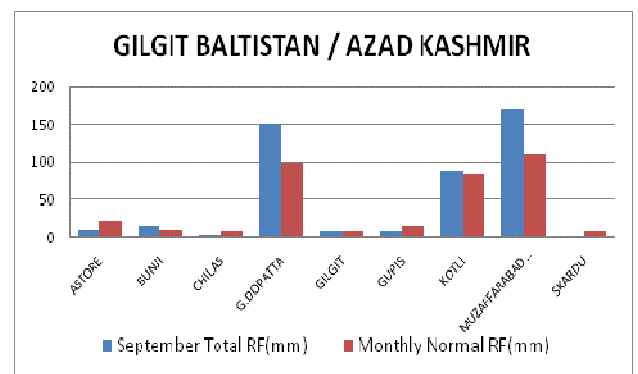
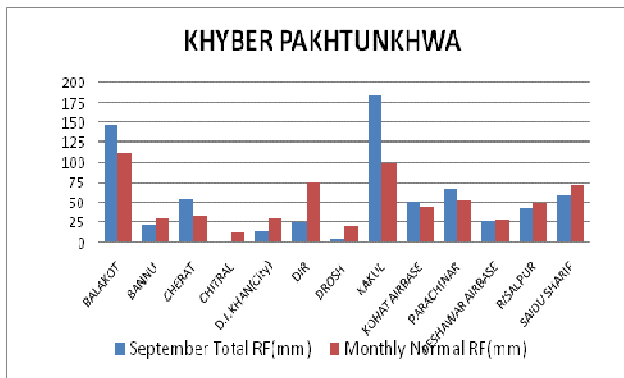


Figure 3: Analysis for Drought conditions of Pakistan

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



II. Normalized Difference Vegetation Index (NDVI)

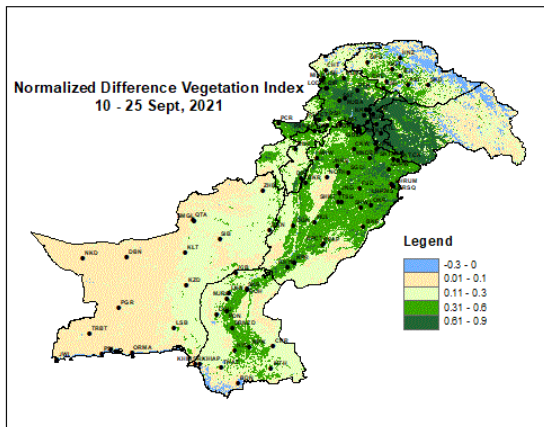


Figure 4: NDVI during 10 to 25 Sept, 2021

Normalized Difference Vegetation Index values for the month of September 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)

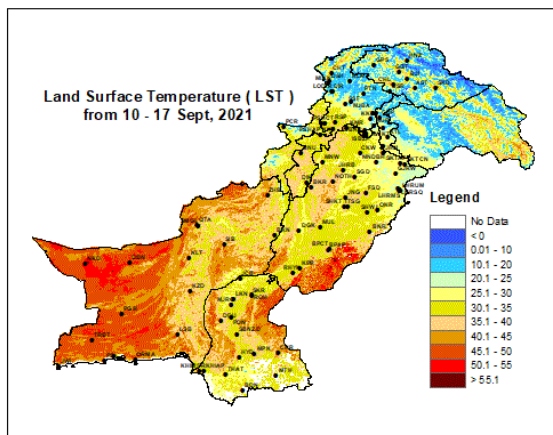


Figure 5: LST (°C) during 10-17 September, 2021

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

LandSurface Temperatures during the period 18 – 25 September are shown in Fig. 6. Increase in daytime temperatures has been observed in most parts of the country as compared to the previous week.

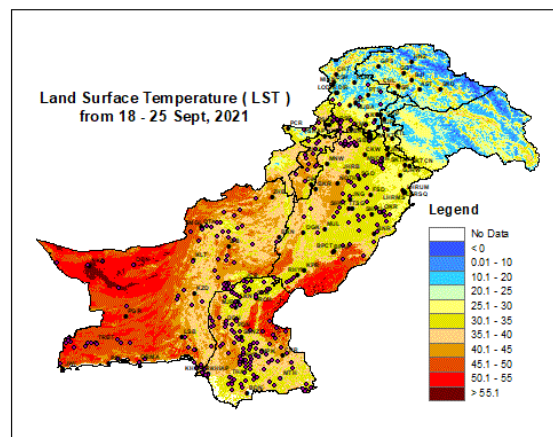
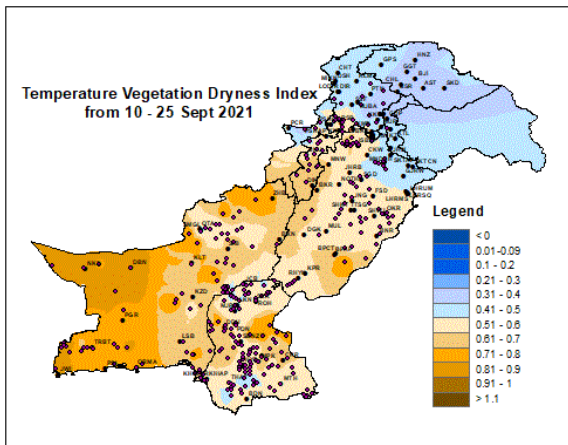


Figure 6: LST (°C) during 18 - 25 Sept, 2021

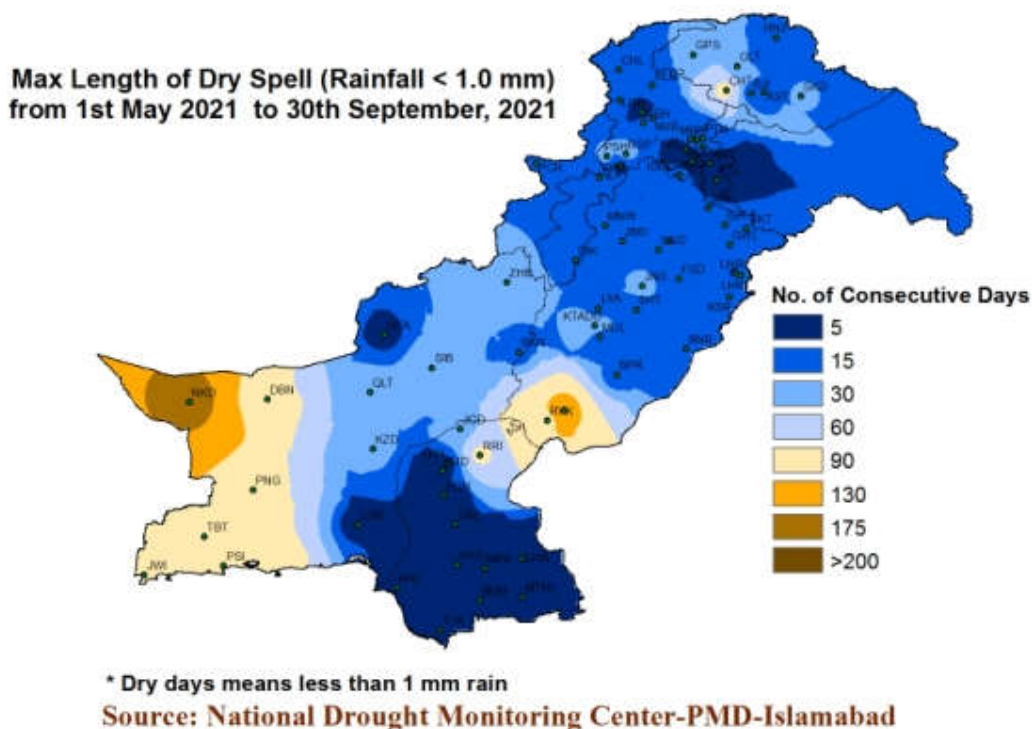
IV. Temperature Vegetation Dryness Index (TVDI)



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 10 - 25 Sept-2021

V. Length of Consecutive Dry Days Spell



3. Water availability/ Dams flow data:

During the month of September 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, Terbela and Mangla dams.

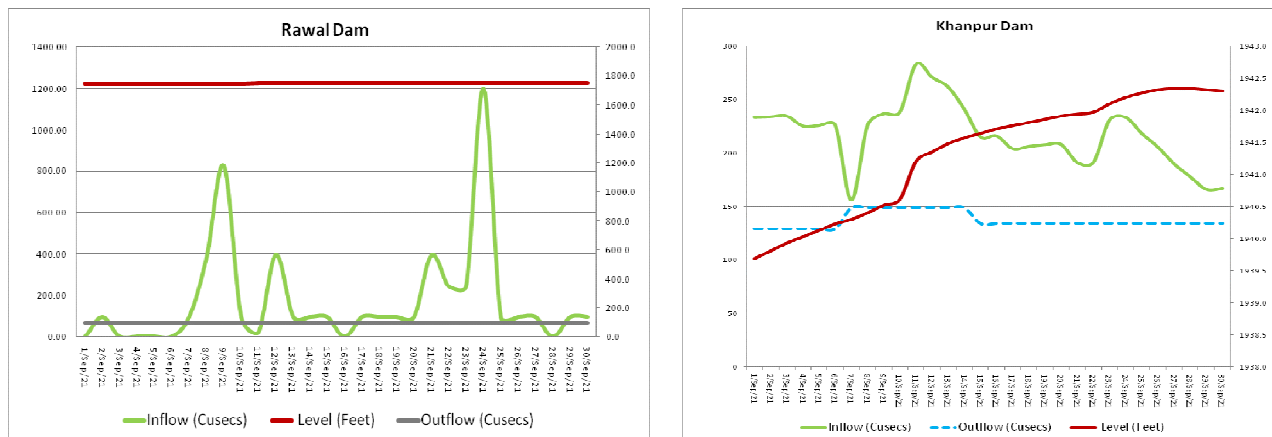


Figure 8: Water inflow, outflow and level of Rawal and Khanpur Dams

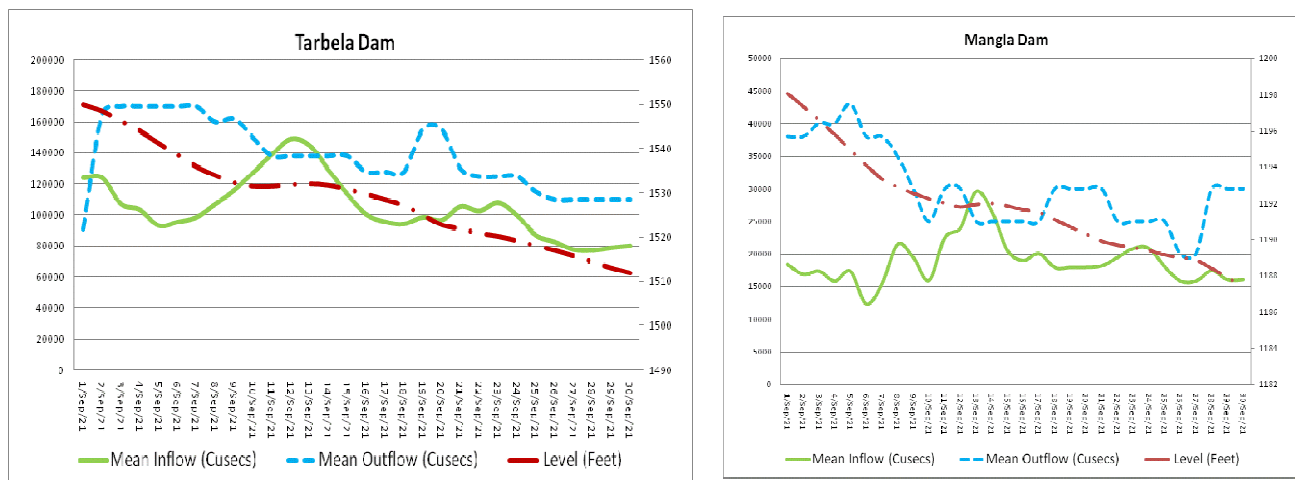


Figure 9: Water inflow, outflow and level of Tarbela and Mangla Dams

4. Weather outlook for October 2021

The month of October is a transitional period between the summer and winter weather systems. Monsoon rains will gradually decrease / withdraw from Pakistan, while westerly waves will continue to pass across north of the country. In general, October is considered as one of the driest month of the year. Days will be hotter and the nights will be cooler as compared to the last month.

Under the influence of westerly waves, 2-3 spells of isolated rains may occur over upper parts of the country (Khyber Paktunkhawa, Upper Punjab, Gilgit-Baltistan and Kashmir during first and second half of the month. Mostly dry weather conditions are expected to prevail in southern half (Sindh and Balochistan) of the country during the month. The night temperatures are expected to drop by about 3-5°C relative to September. High agricultural plains of Balochistan are expected to experience some cool nights towards the end of the month

5. Drought Outlook for September 2021

The month of September was good for most of the drought prone areas of Sindh giving relief there. *In Balochistan, Districts Chagai, 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.

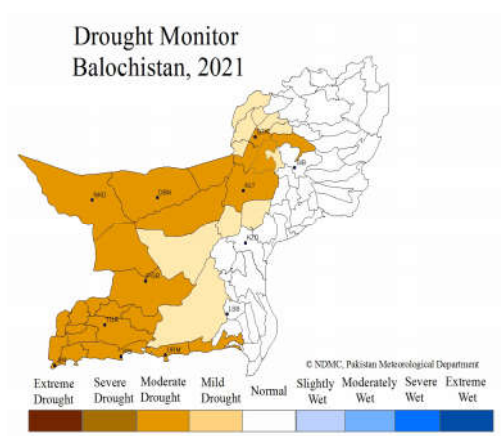


Fig-10: Conditions across Balochistan

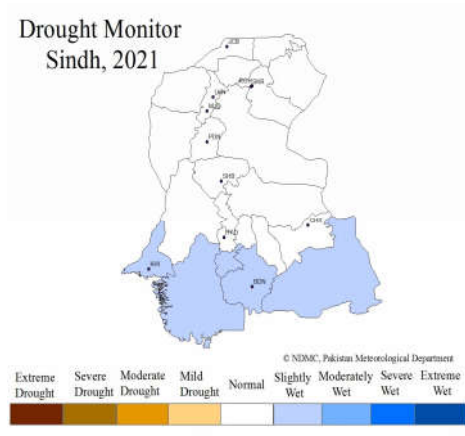
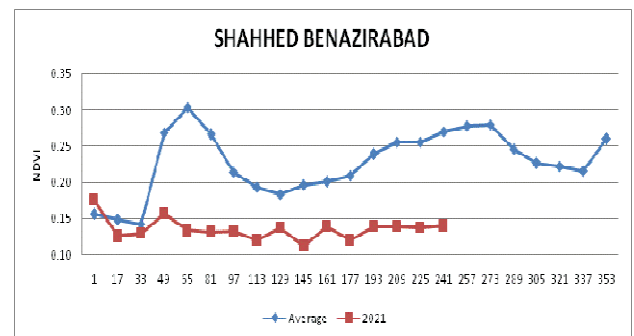
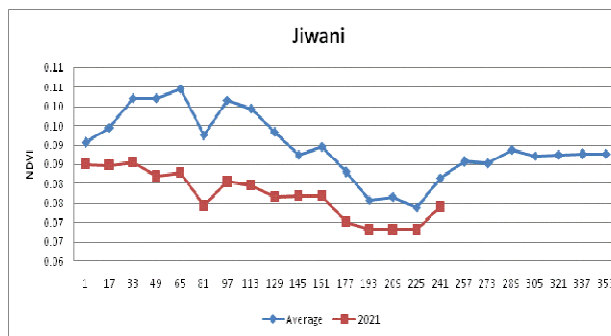
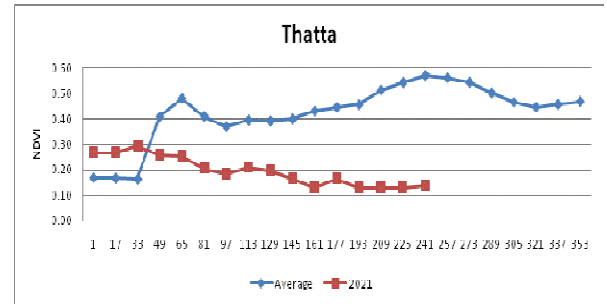
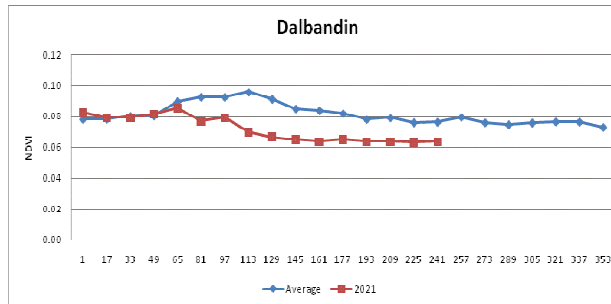
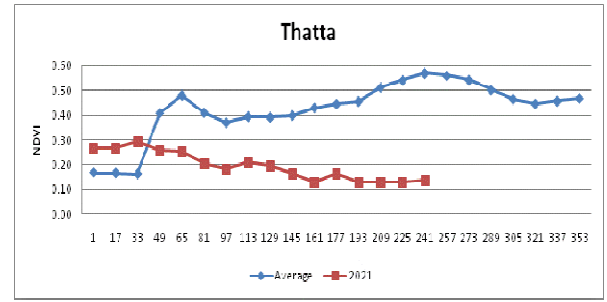
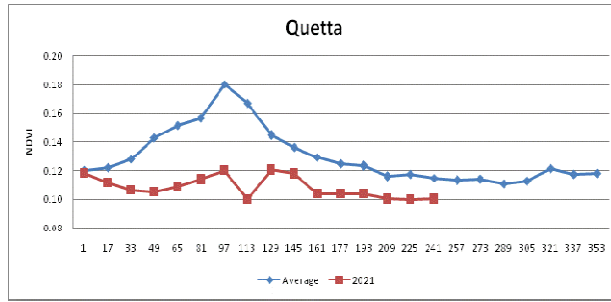


Fig:11 Drought Conditions across Sindh

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:

The Kharif Crops season varies by region, starting at the earliest July-September, usually sown at the beginning of the first rains during the advent of the south-west monsoon season, and they are harvested at the end of monsoon season (October). Depending on the region, Sunflower is at the Maturity stage in Sindh. Sugercane is at the Tillering stage. Threshing of rape Mustard is completed.

7. Advice for Farmers:

- I. Pest/viral attacks and more weeds growth are expected after expected monsoon rains in sugarcane and other standing crops in upper parts of the country. Farmers are therefore advised to take in time precautionary measures in this regard.
- II. Farmers of rainfed areas obtaining water through tube wells and irrigated areas in upper parts are advised to schedule the irrigation according to the expected weather mentioned during the decade. Rainfall/ gusty winds after irrigation cause water logging of standing crops like maize, sugarcane and cotton. Farmers should be very careful in this regard.
- III. Farmers of upper half of the country are advised to complete sowing of Kharif crops in time to utilize fully the present soil moisture especially growers of maize crop in rainfed areas.
- IV. Farmer 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.

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8. Dengue Alert-I:



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No. CIIC-1(1)-Admn/2020/
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Islamabad, the 30th September, 2021

SUBJECT: Dengue Alert-I: Conducive environment for outbreak

Dengue fever has deepens its roots and impacted severely the health of people over the last ten years in the country. This phenomenon occurs especially during the post-monsoon season (20th September till 5th December) provided the conditions are favorable. The dengue triggers during those periods where temperature and humidity threshold remains 26-29°C (3-5 weeks) and 60% respectively. Moreover, the rainfall remains ≥ 27 mm with a maximum time lag period of 3 weeks. The active period for dengue attacks is two hours after sunrise and two hours before sunset. The breeding stops once the temperature falls below 16°C.

2. Keeping in view the past data analysis, current and future climate outlook, the above mentioned atmospheric variables are providing an ideal environment for a dengue outbreak. Based on the analysis, the environment will be conducive in October 2021 for dengue spread and it is predicted that it may outbreak particularly in eight major cities of Pakistan i.e., Karachi, Lahore, Peshawar, Rawalpindi, Islamabad, Hyderabad, Faisalabad and Multan during 10th October to 20th November, 2021 (Annex 1).

3. It is advised to all stakeholders to take pre-emptive measures for control of dengue outbreak. National Health agencies and Dengue control centers are advised to keep themselves updated from PMD website <http://www.pmd.gov.pk>


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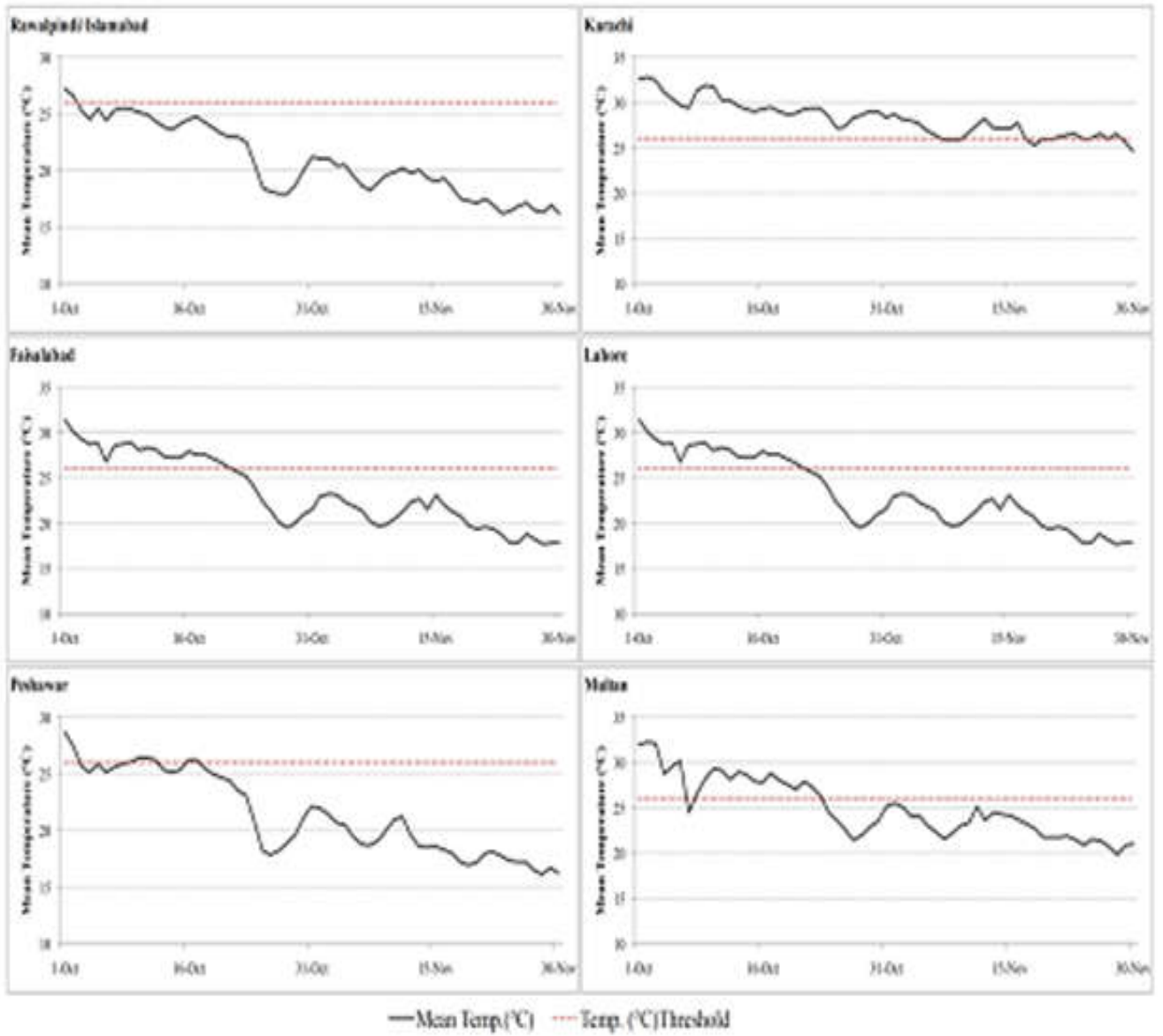


Figure 1 Temperature forecast and threshold for Dengue outbreak in vulnerable districts during Oct-Nov 2021