



# PRECIPITATION / TEMPERATURE OUTLOOK JJAS 2025

The 3<sup>rd</sup> Session of the Third Pole Climate Forum and Meeting of  
the Third Pole RCC-Network Task Team  
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# Outline

Overview of JJAS 2024

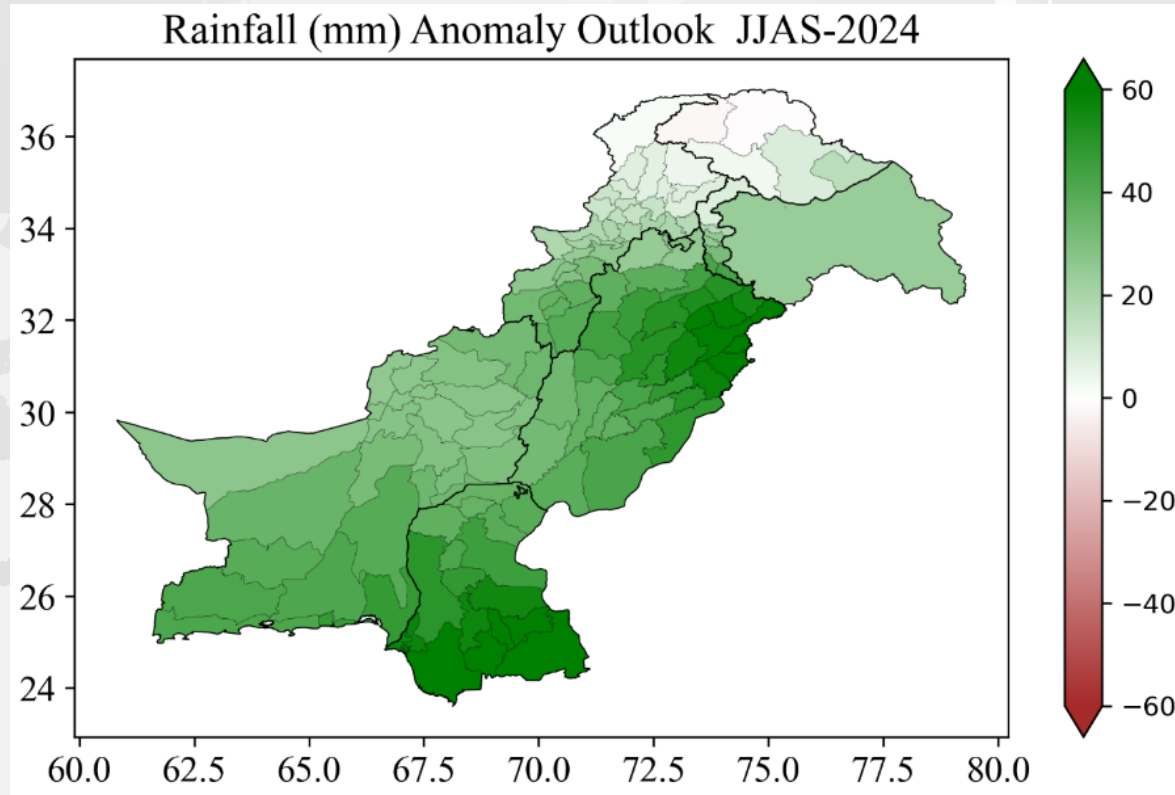
Current Climatic Conditions

Outlook for JJAS 2025

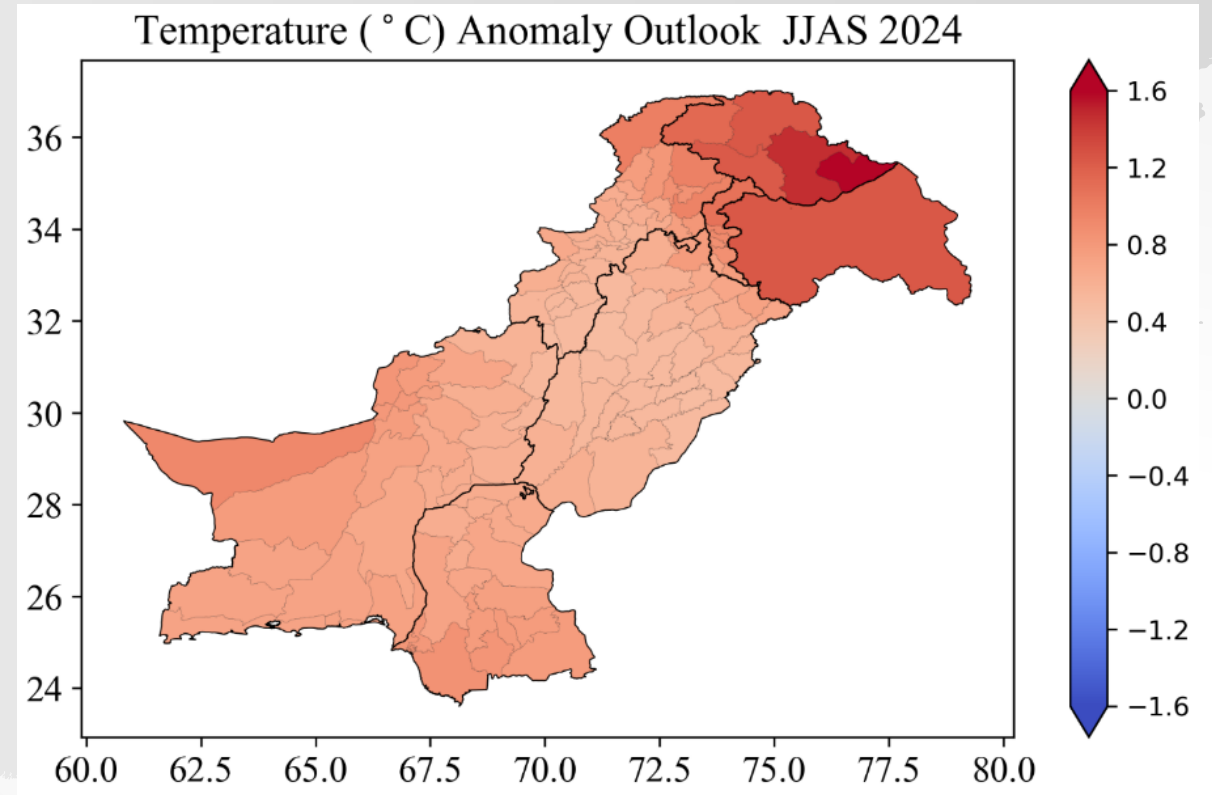
Impacts/risks

# Overview of JJAS 2024

## National outlook produced for JJAS 2024 Precipitation



## National outlook produced for JJAS 2024 Temperature

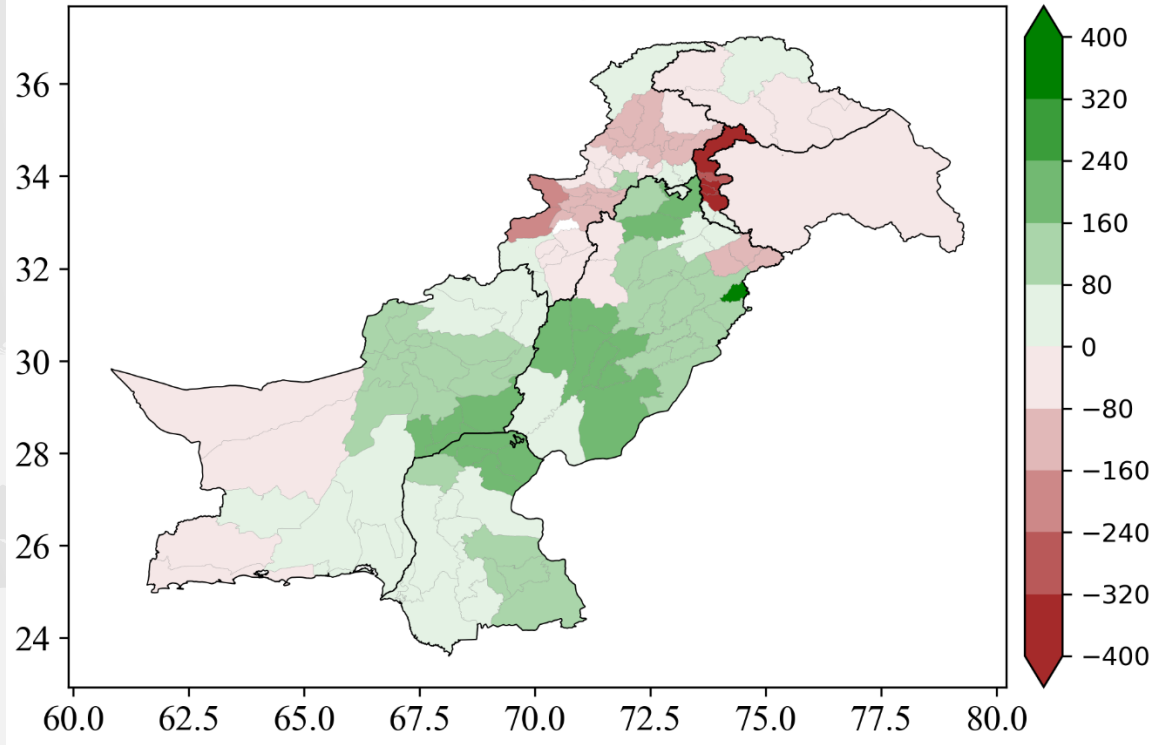


- Normal to above normal precipitation was forecasted over most parts of the country for Monsoon 2024.
- The temperature was expected to remain above normal nationwide.

# JJAS 2024 Observed Variables

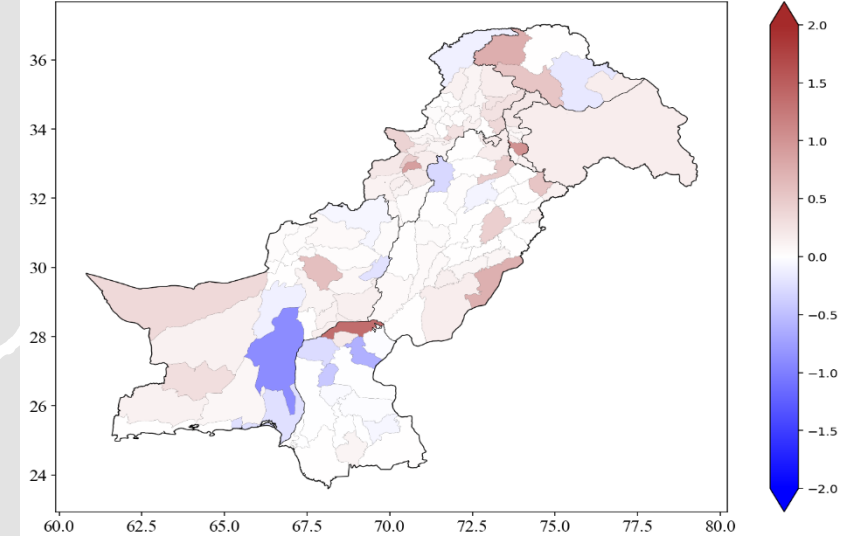
## Precipitation (Anomaly)

Observed Rainfall Anomaly (mm), (JJAS, 2024)

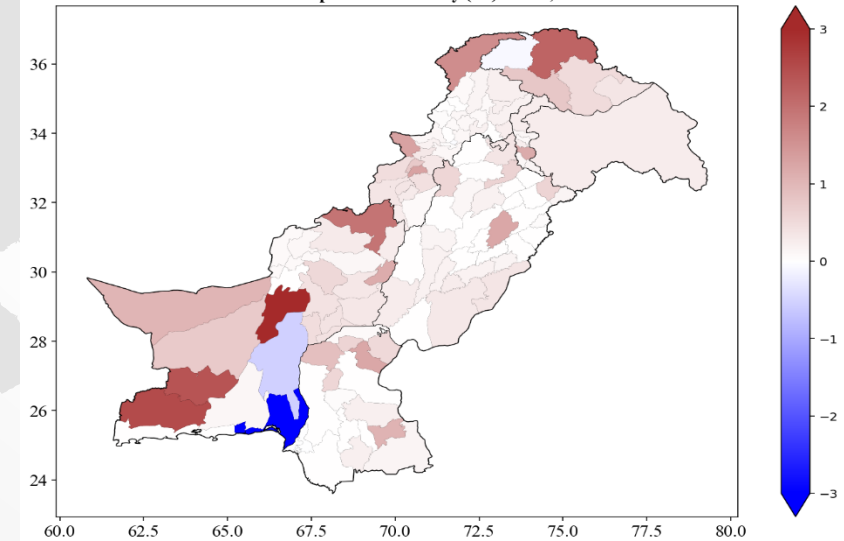


## Temperature Anomaly

Maximum Temperature Anomaly (°C): JJAS, 2024

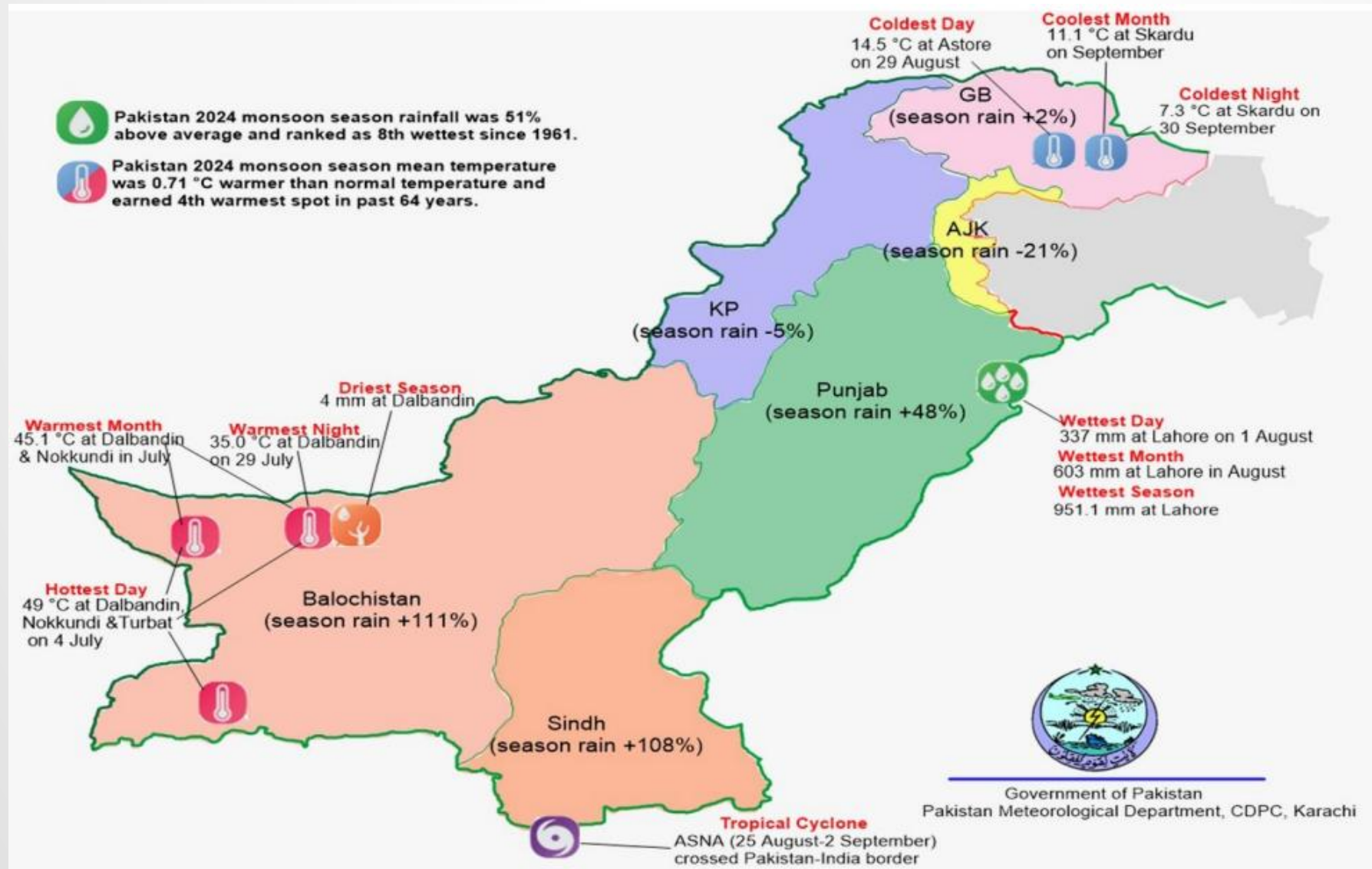


Minimum Temperature Anomaly (°C): JJAS, 2024



- For Monsoon 2024 season precipitation was above normal over eastern parts (Punjab and Sindh) as well as Balochistan as averaged over the whole province. The northern parts (Kashmir, GB and KP) experienced below normal precipitation during the season.
- Tmax was observed having mixed pattern.
- Tmin mainly remained above normal over most parts of the country.

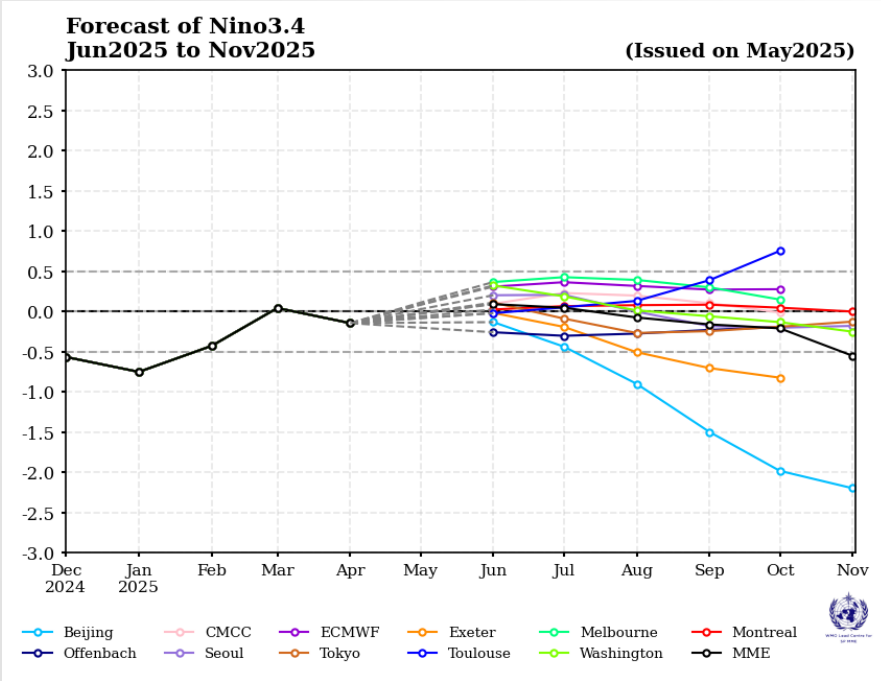
# EXTREME EVENTS DURING MONSOON 2024



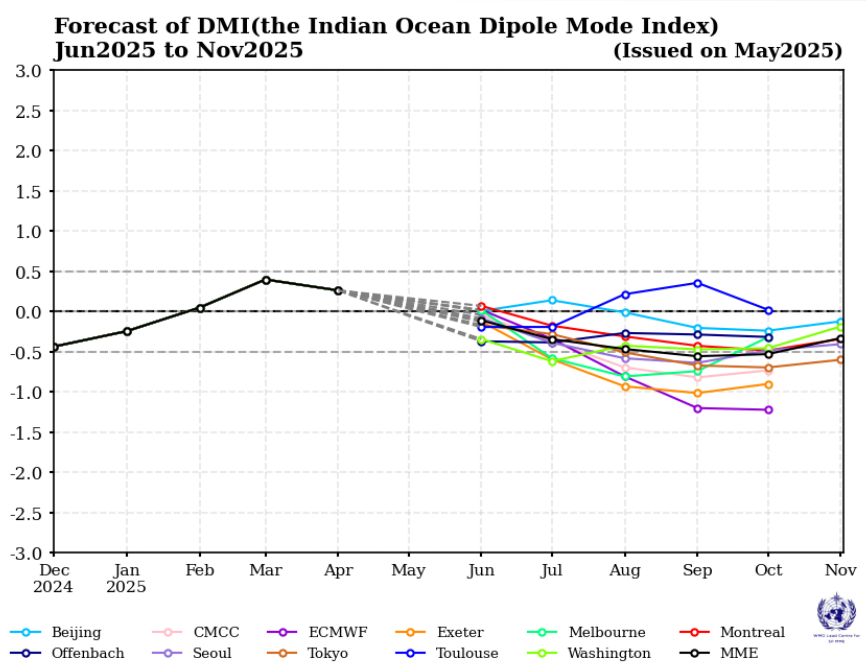
# Current Climatic Conditions

# ATMOSPHERIC CONDITION

## ENSO (La Niña)



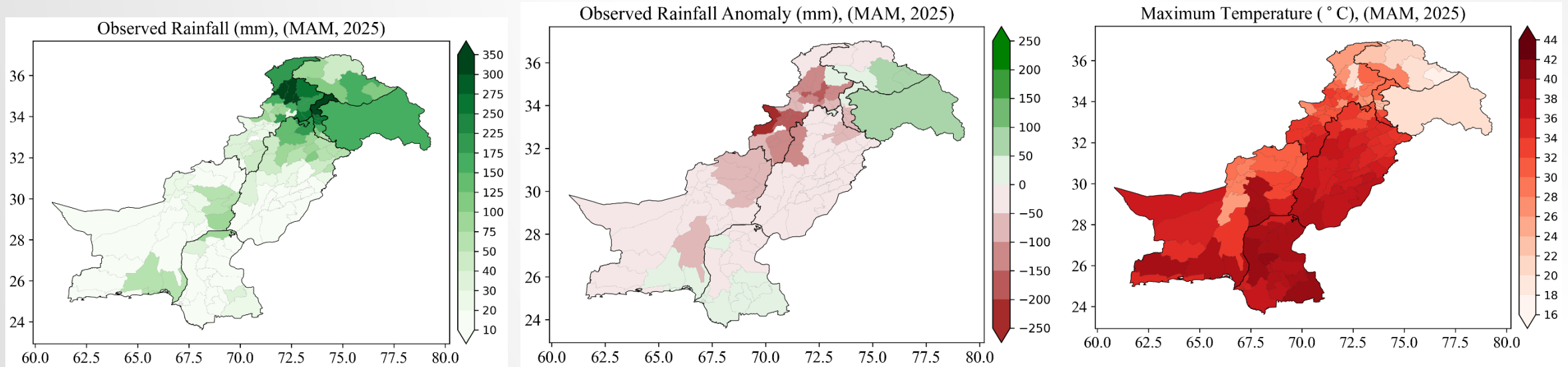
## Indian Ocean Dipole (IOD)



- During the season JJAS 2025, the Indian Ocean Dipole (IOD) is in a neutral phase but is expected to transition to a negative phase during the season.
- Meanwhile, the El Niño Southern Oscillation (ENSO) is projected to remain in a neutral phase throughout the season.



# CURRENT CLIMATIC CONDITIONS OF PAKISTAN



- Below normal rainfall was recorded during the season March to May (MAM, 2025).
- A few high intensity thunderstorm events with gusty winds and hailing were observed mostly in the upper half of the country.
- Above-normal temperatures were recorded nationwide.
- Temperature crossed 45°C mark on multiple days during the month of May; particularly over Parts of Sindh, southern Punjab and the adjoining areas of Balochistan.

# Precipitation/Temperature Outlook, JJAS 2025

# Methodology PMD Forecast

Model	Ens (Hindcast/Forecast)	Data Availability
1. APCC-SCOPS	10	1982-2013
2. BOM-ACCESS-S2	3/11	1990-2012
3. CMCC- SPS3.5	40/50	1992-2017
4. CWA-TCWB1Tv1.1	30	1982-2019
5. HMC-SL-AV	10/20	1985-2010
6. KMA-GLOSEA6GC3.2	12/42	1991-2016
7. METFR-SYS9	25/51	1991-2016
8. NCEP-CFSv2	20	1982-2010
9. PNU-CGCMv2	35	1980-2020
10. UKMO-GLOSEA6	28/42	1991-2016
11. ECCC-CANSIPsv3	20	1980-2020

- ***Simple Composite Method (SCM)***

- Represented as the Anomaly from the long term normal conditions.

$$F_t = \frac{1}{N} \sum_{i=1}^N (F_{i,t} - \bar{F}_i)$$

- ***Probabilistic Forecast***

- Tercile based probabilistic forecast, incorporating the set of all the ensemble members.
- Represented as probabilities of Above/Near/Below normal of each parameter.



# CLIMATE MODELS SELECTION CRITERIA (PRECIPITATION/TEMPERATURE)

## Precipitation

Models	Correlation	Index of Agreement
APCC	-0.04	0.31
BOM	0.36	0.48
CMCC	0.33	0.41
CWA	0.15	0.39
ECCC	0.33	0.50
HMC	-0.06	0.36
KMA	0.41	0.61
METFR	-0.06	0.37
NCEP	0.35	0.43
PNU	0.32	0.42
UKMO	0.45	0.63

## Temperature

Models	Correlation	Index of Agreement
APCC	0.29	0.11
BOM	0.49	0.65
CMCC	0.60	0.38
CWA	0.35	0.60
ECCC	0.30	0.39
HMC	0.15	0.25
KMA	0.45	0.59
METFR	0.32	0.28
NCEP	0.34	0.38
PNU	0.47	0.20
UKMO	0.49	0.67

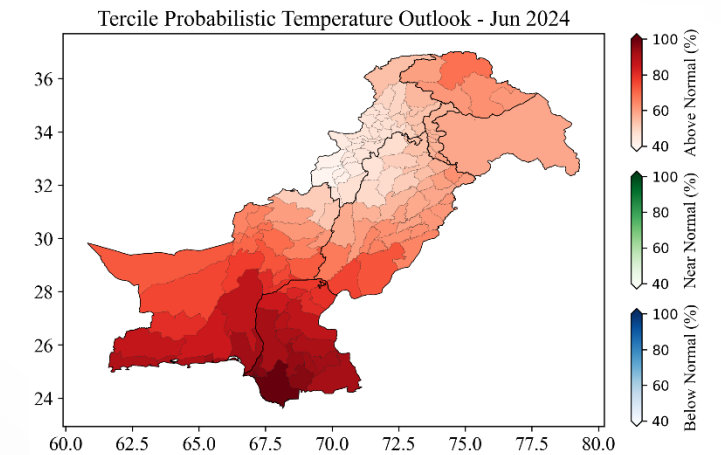
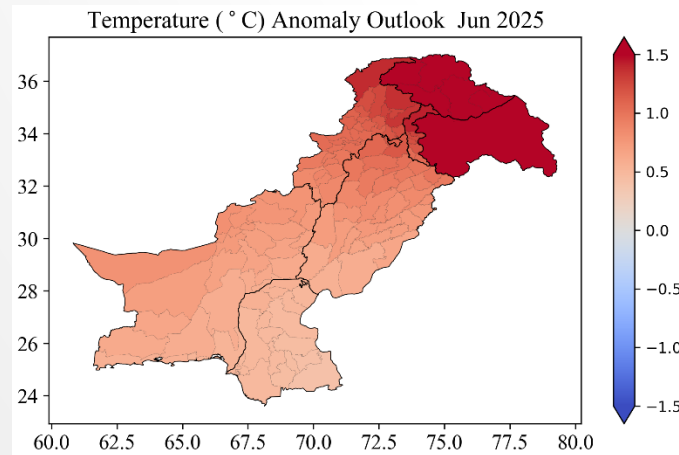
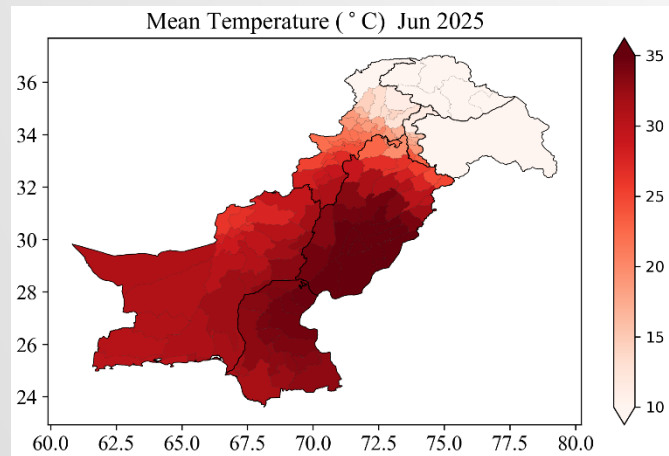
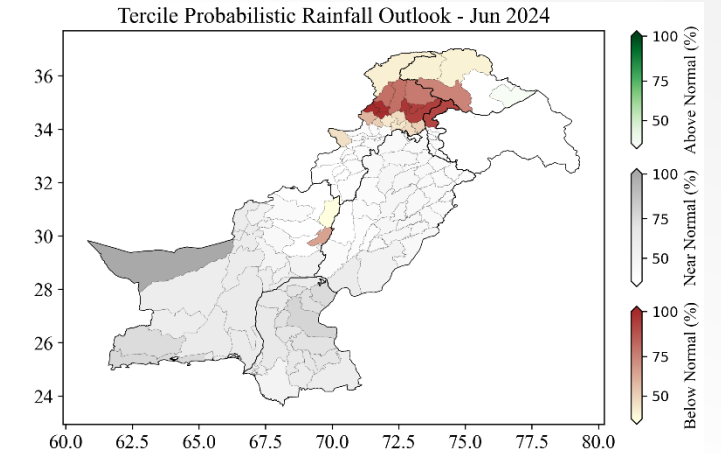
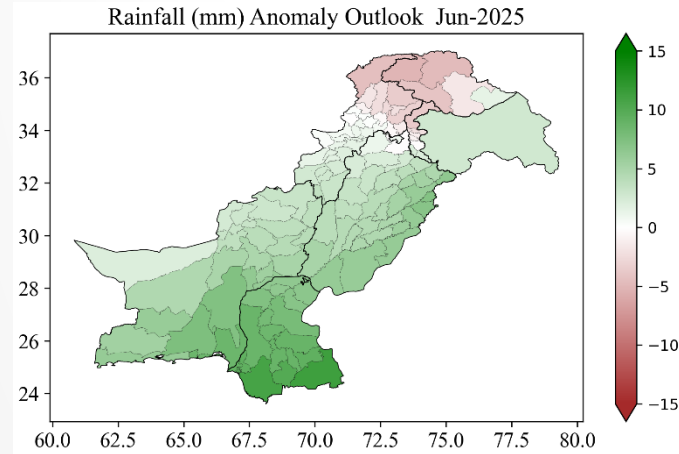
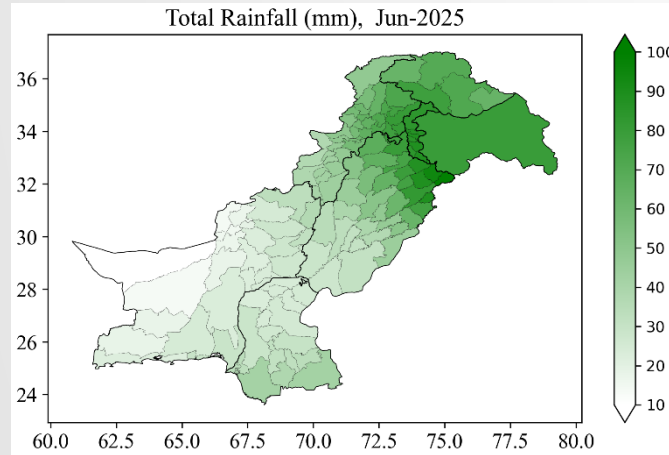
Models with better correlation and Index of Agreement with historical data are included in the current outlook.

- Correlation measures the statistical relationship between two variables, indicating how closely they move together. It ranges from -1 to +1:
  - +1: Perfect positive correlation (both variables increase together).
  - 1: Perfect negative correlation (one increases as the other decreases).
  - 0: No linear relationship.

The Index of Agreement (IA) is a statistical measure used to assess the agreement between observed and predicted values. The IA value ranges from 0 to 1, where 1 indicates perfect agreement between observed and predicted values, and 0 indicates no agreement.

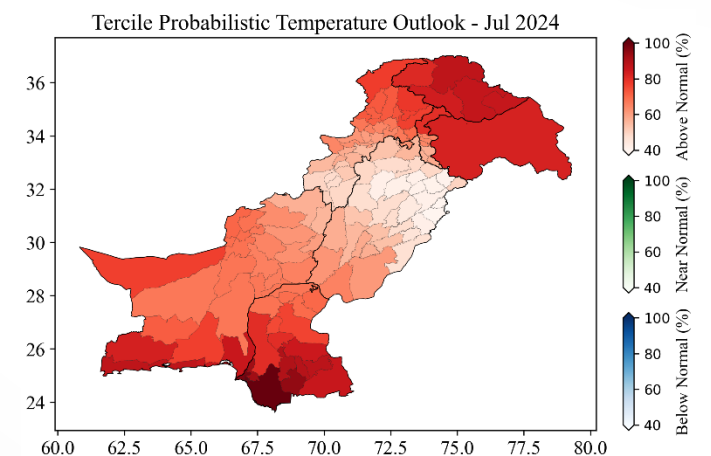
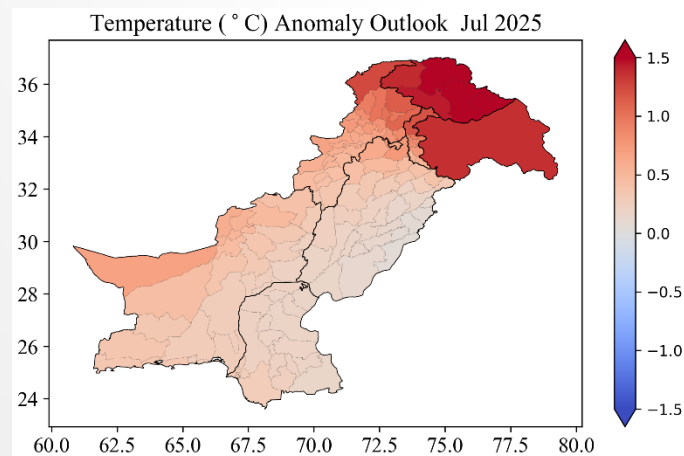
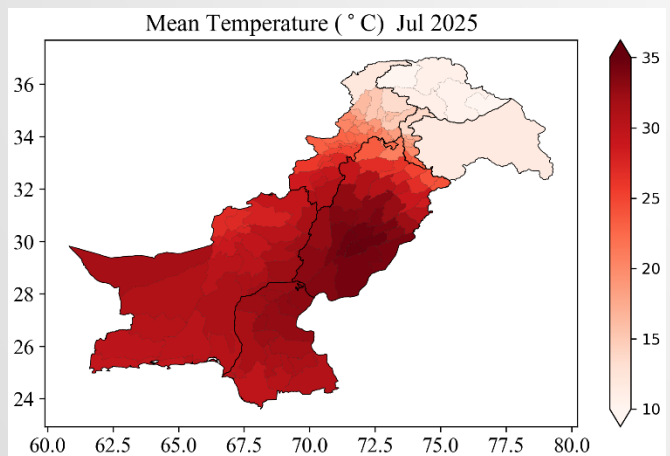
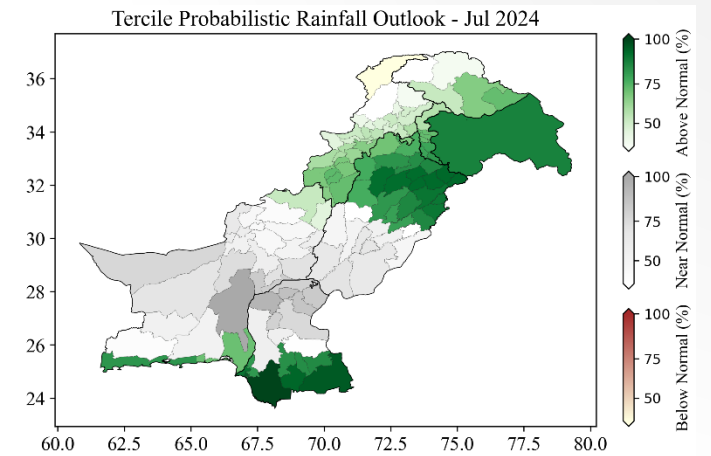
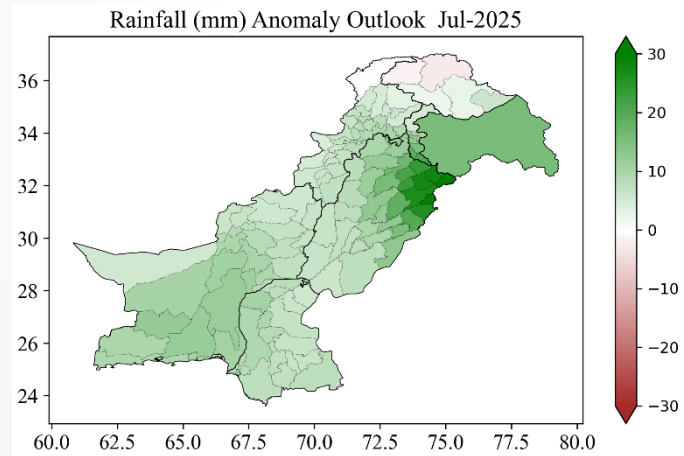
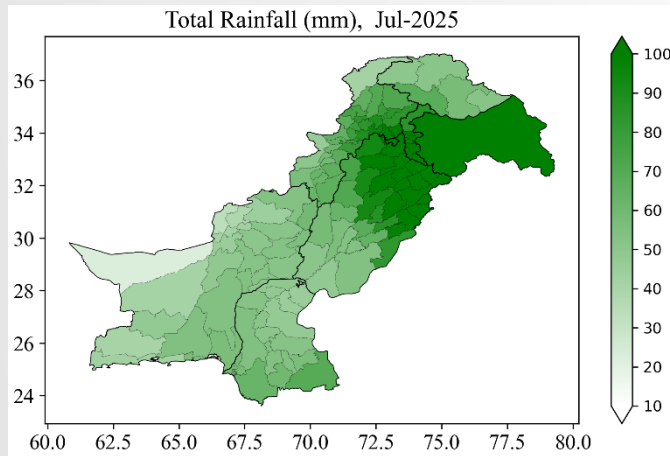
# Monthly Precipitation/Temperature Outlook

# JUNE, 2025



- Nearly normal precipitation is expected in the month of June.
- The temperatures will remain above normal over most parts; the northern parts will experience maximum deviation from the normal.

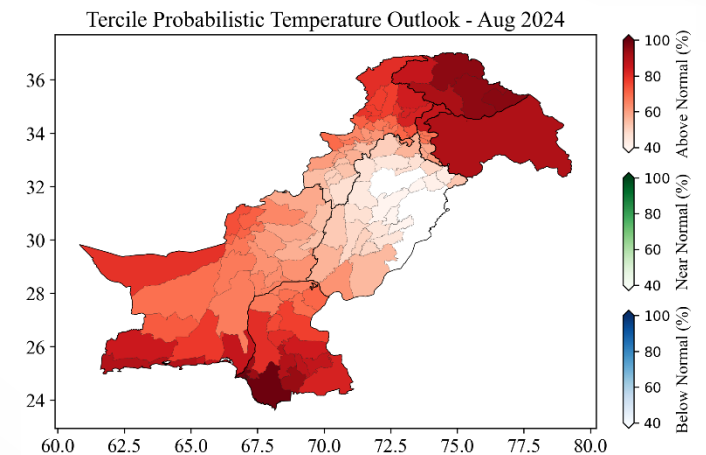
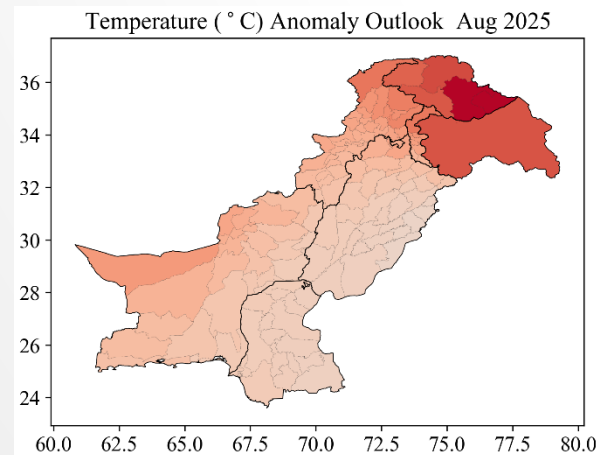
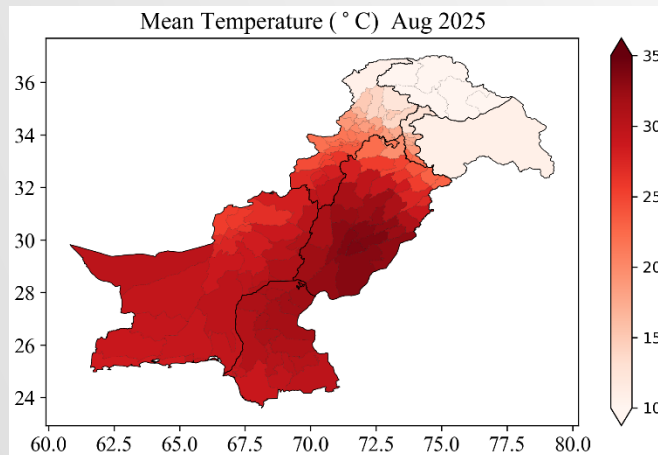
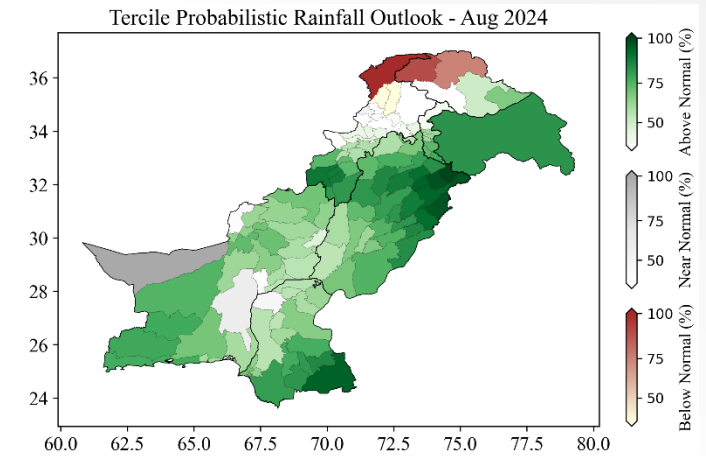
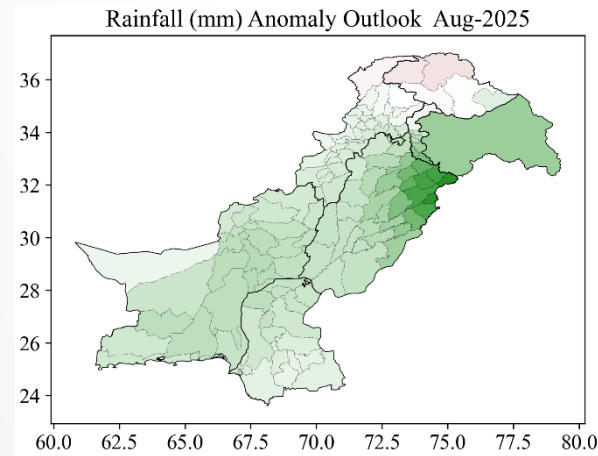
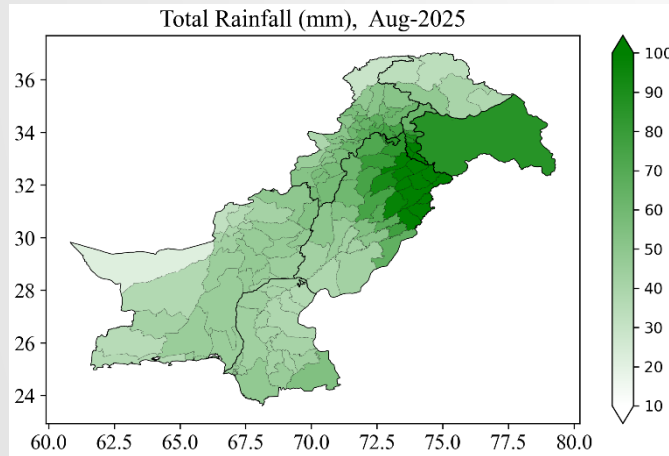
# JULY, 2025



- Nearly normal to above normal rainfall is expected in July.
- The temperatures will remain above normal over most parts; the northern parts will experience maximum deviation from the normal.



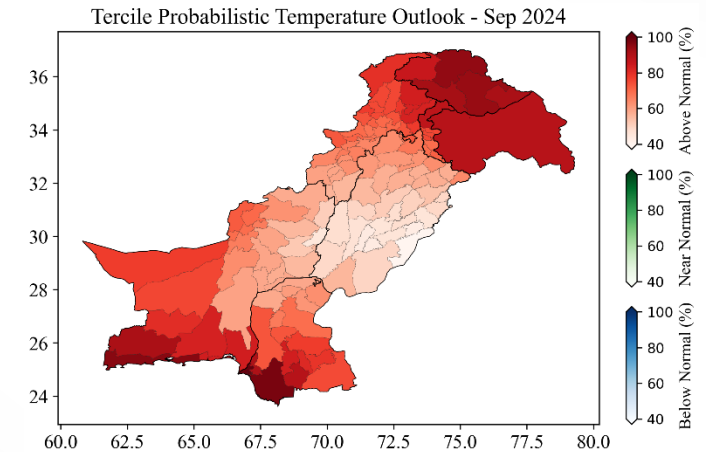
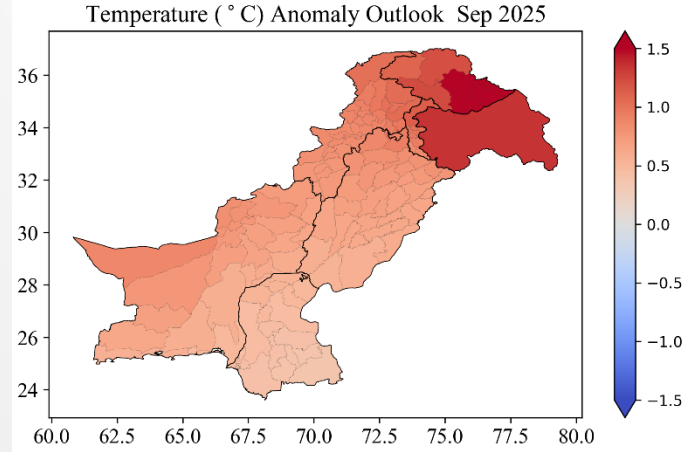
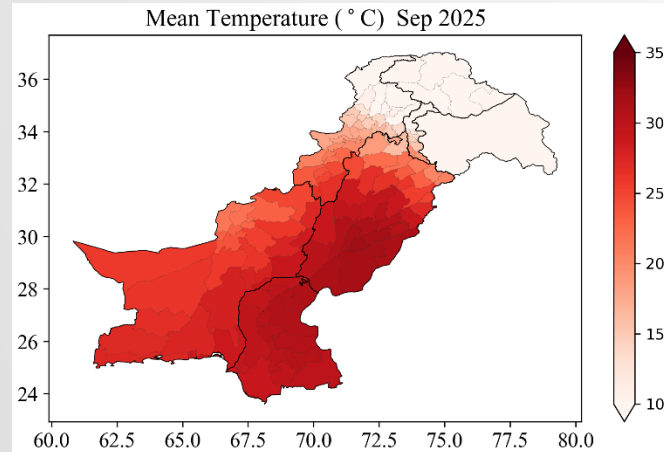
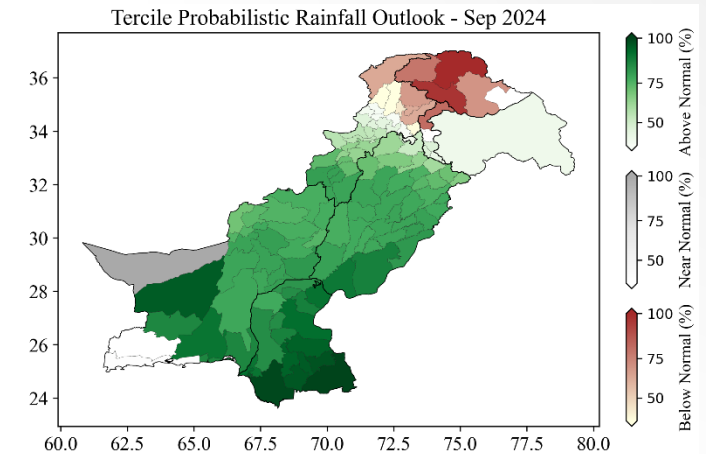
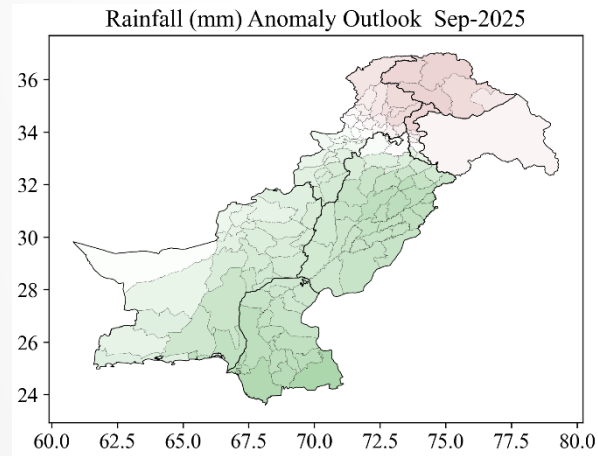
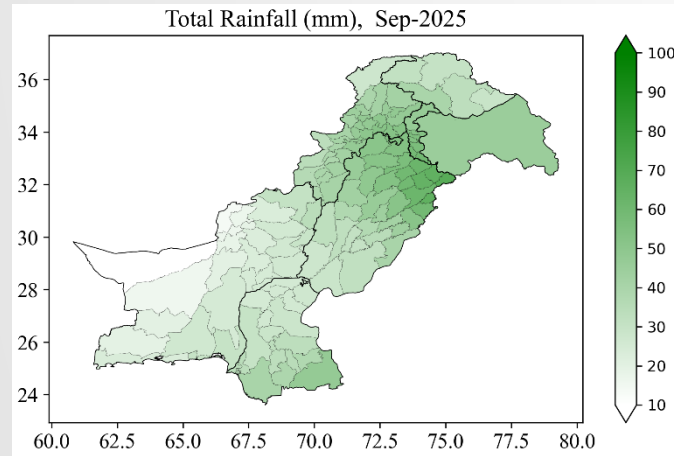
# AUGUST, 2025



- Above normal rainfall is expected in August; with maximum departure over Punjab and Sindh.
- The temperatures will remain above normal over most parts; the northern parts will experience maximum deviation from the normal; most parts of Punjab will experience nearly normal temperatures.

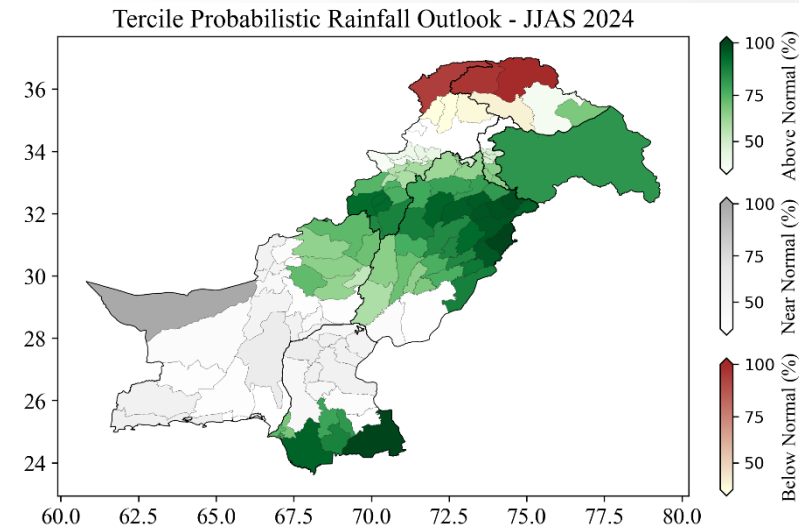
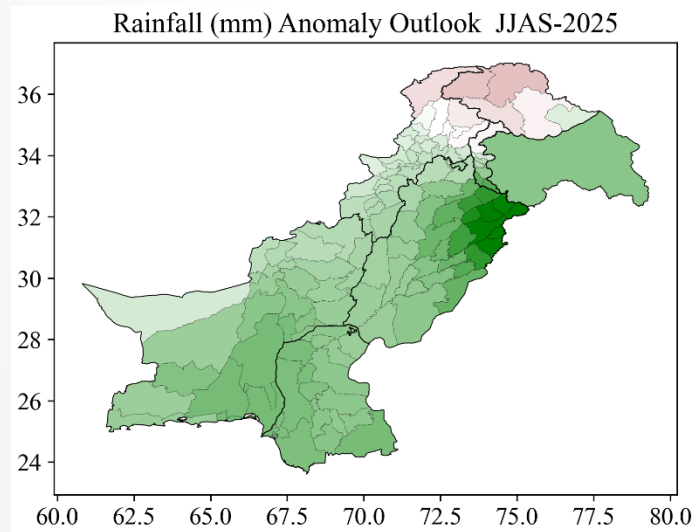
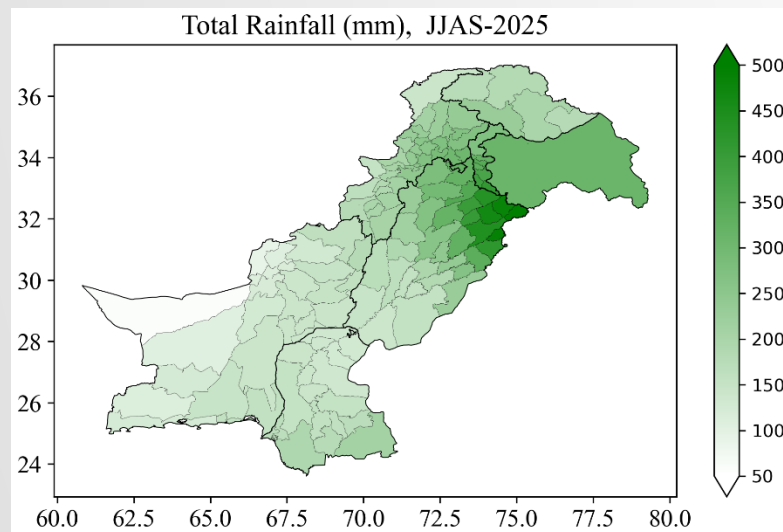


# SEPTEMBER, 2025



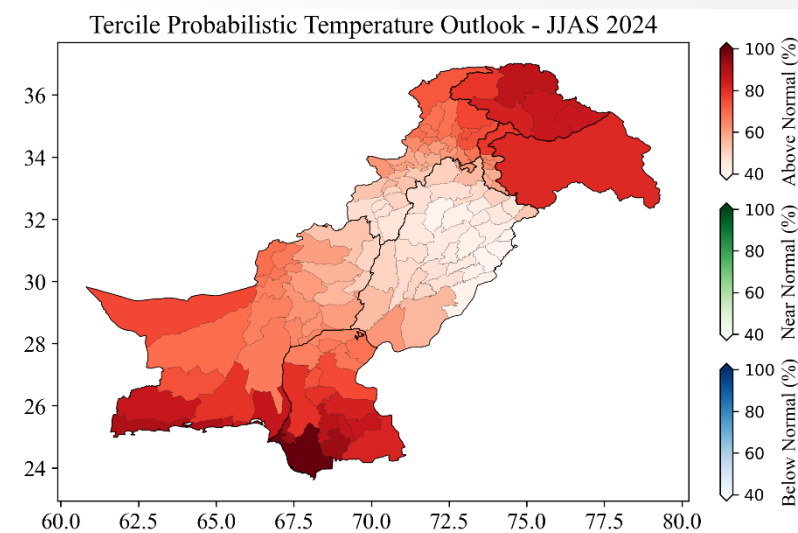
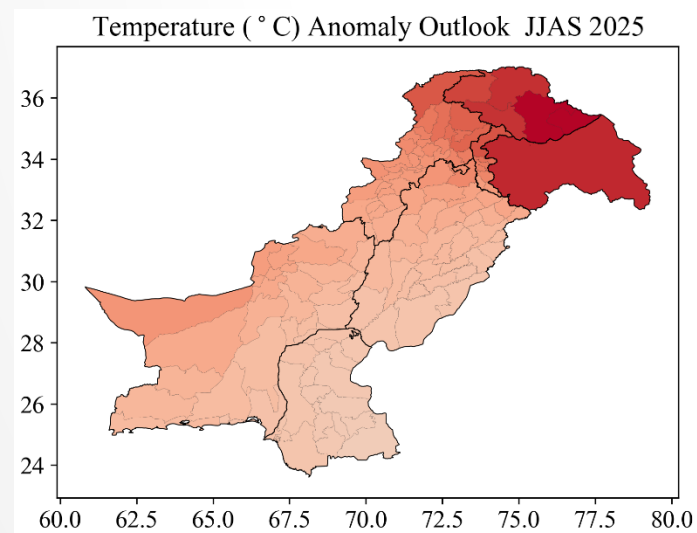
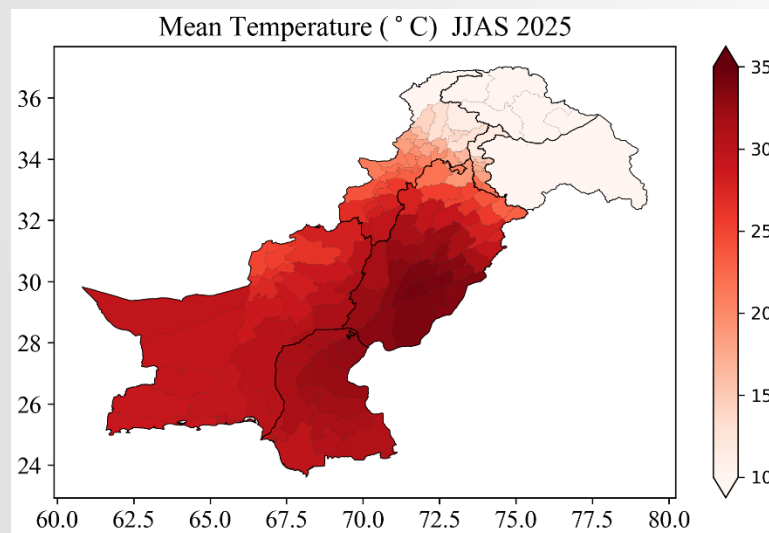
- Above normal rainfall is expected over most parts of the country during September whereas, northern KP and GB may get slightly below normal rainfall.
- The temperatures will remain above normal over most parts; the northern parts will experience maximum deviation from the normal.

# SEASONAL PRECIPITATION OUTLOOK (JJAS 2025)



- As per seasonal outlook **normal to above normal** rainfall is expected in most parts of the country, with maximum departure over northeastern Punjab.
- Northern Khyber Pakhtunkhwa and Gilgit Baltistan may get nearly normal/slightly below normal rainfall during the season JJAS 2025.

# SEASONAL TEMPERATURE OUTLOOK (JJAS 2025)



- Nationwide, the temperature is expected to be above **normal**.
- Northern parts (northern KP and GB) may experience maximum departure.
- Central parts (Punjab and southern KP) are expected to experience normal to slightly above normal temperature.
- The probability for above normal temperature is also more likely over northern and southern parts of the country.

# AREA AVERAGE RAINFALL AND TEMPERATURE ANOMALIES

**Table 1:** Normal rainfall and seasonal departure (%)

Region	Normal Rainfall (mm)	Departure (%)	Remarks
Pakistan	155	+13	Slightly above normal
Gilgit-Baltistan (GB)	129	-4	Normal
Khyber Pakhtunkhwa (KP)	162	+6	Normal
Azad Jammu and Kashmir (AJK)	246	+8	Normal
Punjab	201	+16	Slightly above normal
Sindh	111	+18	Slightly above normal
Balochistan	95	+19	Slightly above normal

**Table 2:** Normal temperature and seasonal departure

Region	Normal Temperature (°C)	Departure (°C)	Remarks
Pakistan	25	+0.6	Above Normal
Gilgit-Baltistan (GB)	17	+1.4	Above Normal
Khyber Pakhtunkhwa (KP)	20	+0.7	Above Normal
Azad Jammu and Kashmir (AJK)	17	+0.8	Above Normal
Punjab	29	+0.4	Normal
Sindh	31	+0.3	Normal
Balochistan	28	+0.5	Normal

# MONSOON 2025 – POTENTIAL IMPACTS/ RISKS ON PAKISTAN

## **Flooding Risk:**

- Normal to above-normal rainfall in North-Eastern Punjab and AJK may cause flooding (urban & flash flooding)
- Heavy rainfall events may cause flash or urban flooding in hill torrent areas of Koh-e-Suleman and plains of major cities in Sindh, Punjab, AJK, and KP
- Rainfall will also replenish water reservoirs and groundwater resources

## **Snowmelt and GLOFs:**

- More than **1°C** higher temperatures anomalies predicted over Upper Khyber Pakhtunkhwa, Gilgit-Baltistan, and Kashmir may accelerate snowmelt, resulting in increased river inflow
- High temperatures may also lead to Glacial Lake Outburst Floods (GLOFs) in these areas

## **Agricultural Advisory:**

- Major Kharif crops (Sugarcane, Rice, Cotton, Maze) are expected to have normal growth

## **Severe Weather / Heatwaves:**

- Although the general outlook for the rainfall is normal to slightly above normal but the possibility of an extreme rainfall even can not be ruled out
- Normal heatwaves conditions are likely to exist over most parts of the country except in the Northern high mountain areas.

## **Recommendations:**

- Given the recent increase in windstorm events, it is advisable that billboards in major urban areas be either removed or securely reinstalled with enhanced protection to withstand severe wind conditions. Similarly, proactive measures should be taken to protect solar energy structures to minimize the risk of damage during such events.

Thank You