



CAREI SOUTH ASIA



SOUTH ASIA HYDROMET FORUM CLIMATE SERVICES WORKSHOP

Country Presentation: Overview of Climate Services in South Asia

AFGHANISTAN

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OUTLINE OF PRESENTATION

- 1.Current Status of Climate Services
- 2.Forecast Products and Delivery
- 3.Sectoral Advisories and Applications
- 4.Tools, Platforms and Data Use
- 5.Capacity and Gaps
- 6.Expectation from SAHF CS WG



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CURRENT STATUS OF CLIMATE SERVICES

General Overview

Afghanistan is located in Central Asia. The central and northwest is characterized by highland and mountain terrain. The region to the south is classified as desert terrain.

The southwestern part of Afghanistan has a combination of a warm steppe climate and a warm desert climate. The north eastern part has a cold steppe climate.

Afghanistan experiences all four seasons. Wide diurnal temperature ranges and low humidity are experienced year-round.

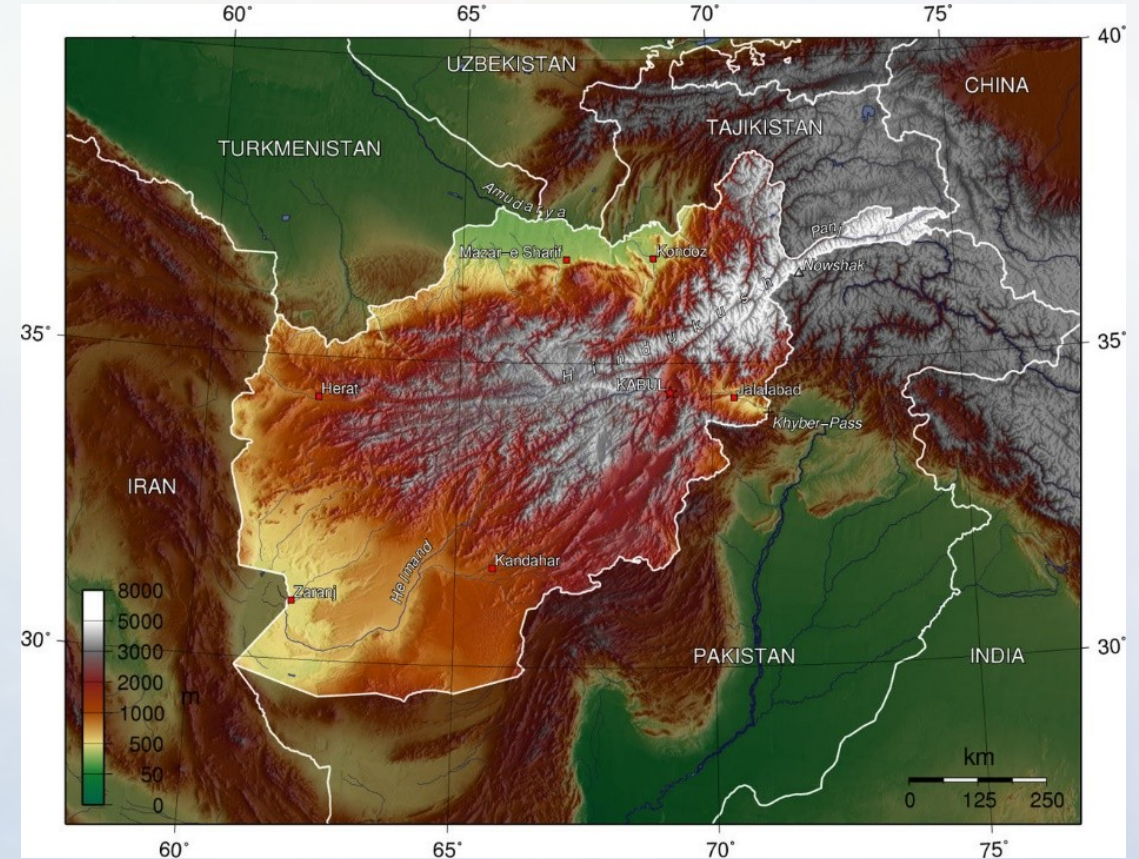


Fig 1. Afghanistan terrain elevation (Meters).

Source: https://en.wikipedia.org/wiki/Geography_of_Afghanistan

Extensive snowfall is experienced in parts of the mountain region in the winter and many communities are isolated from the outside world for up to 4 months. Irrigated agriculture is largely dependent on snow runoff that melts in the spring. In many places, irrigated agriculture is dependent on sufficient snow in the mountains. Snow runoff that occurs in spring is the primary source of water into summer, and can result in flood conditions in the northern regions. Typically 25.4mm of snow cover in the mountains north and east is left in June.

The main dust source regions affecting Afghanistan include the Amu Darya valley and Karakum desert to along the northern borders with Turkmenistan, Uzbekistan, and Tajikistan, as well as the Balkh desert in the Balkh Province. In the Southwest, the dry Hamounlake, Margow desert, Regestandesert, and Kash desert, located in Sistan Basin, serve as primary dust source regions.

Afghanistan Climate Regions:

Afghanistan is divided into five climate regions:

The Hindukush Region

Northern Plains

Central Highlands

Eastern Slopes.

Southern Plateau

Afghanistan's National Adaptation Program of Action for Climate Change (NAPA) lists, 5 main climatic hazards:

Drought

Flood

Warming,
heat/cold waves

Thunder

Monsoon, 120 day
wind

Climate change in Afghanistan

- Afghanistan, located in the south part of central Asia, is a mountainous country with generally cold winters and hot summers
- The country has an extreme continental arid climate that is characterized by desert, steppe, and highland temperature regimes
- Temperatures vary on average from -10°C in winter to 34°C in summer, with extremes reaching as high as 49°C in the desert regions and as low as -25°C in the higher mountain areas
- Farmers, mostly in least developed countries (such as Afghanistan), are relatively more affected by the impacts of climate change and extreme weather events

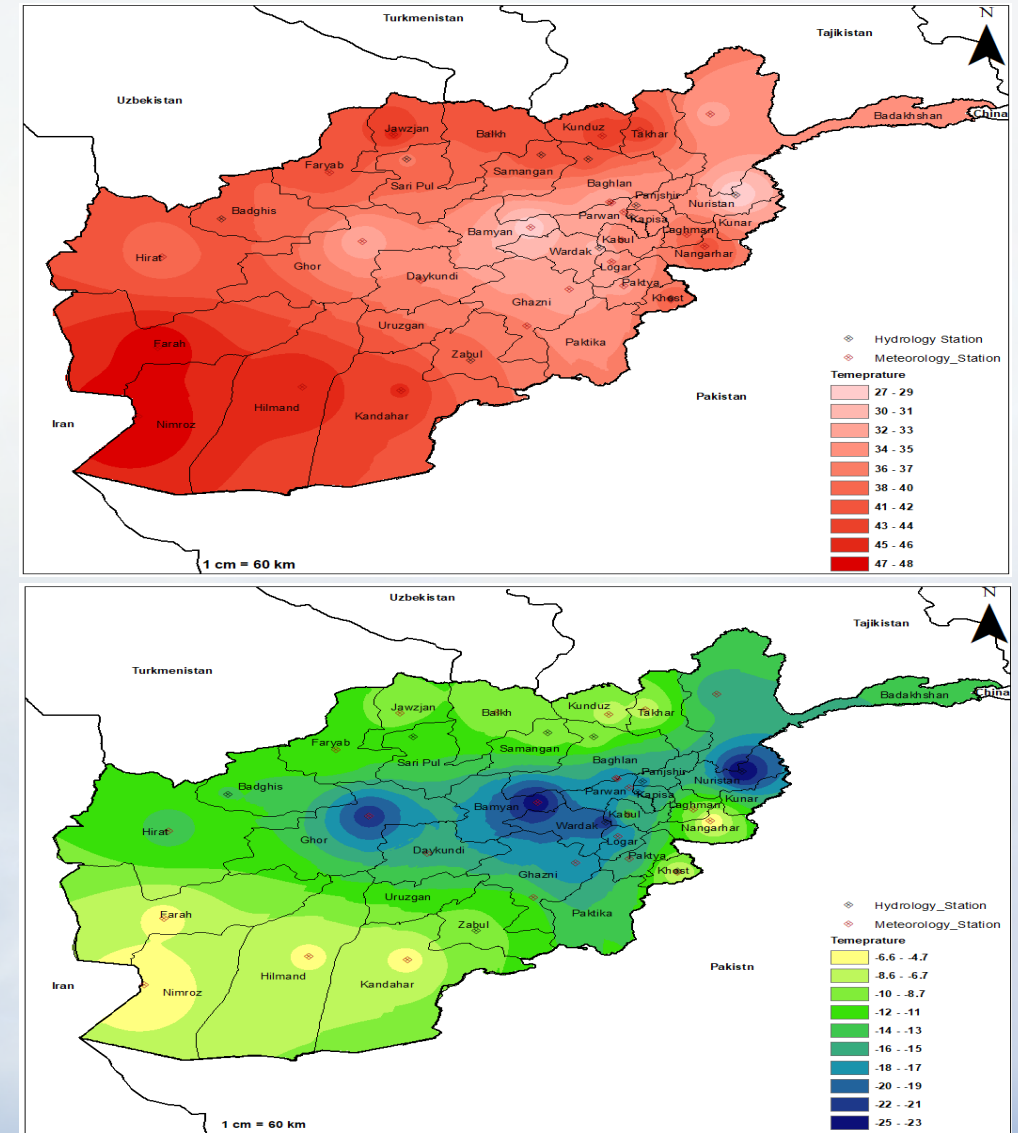


Fig 2. Maximum & Minimum temperature average from 1993-2023. *Source, AMD.*



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FORECAST PRODUCTS AND DELIVERY

Seasonal forecast prediction

For seasonal forecast prediction we use NASA & CMC1 maps, and extract maps from CPT, FOCUS2(RIMES) etc.

More information on the seasonal forecast and other information about weather and climate are available in the website of the AMD in Pashto, Dari and English languages.

<http://www.amd.gov.af>

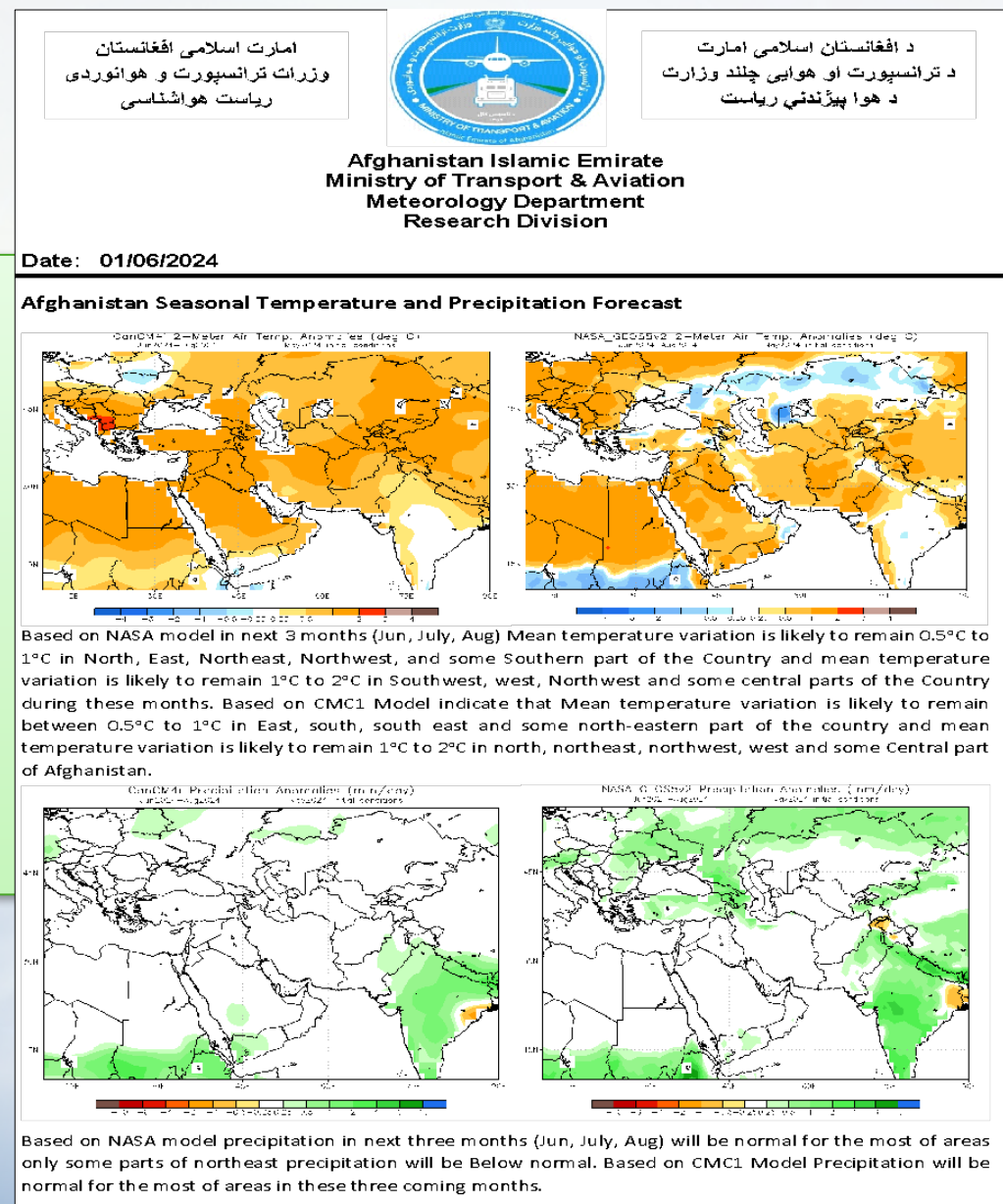
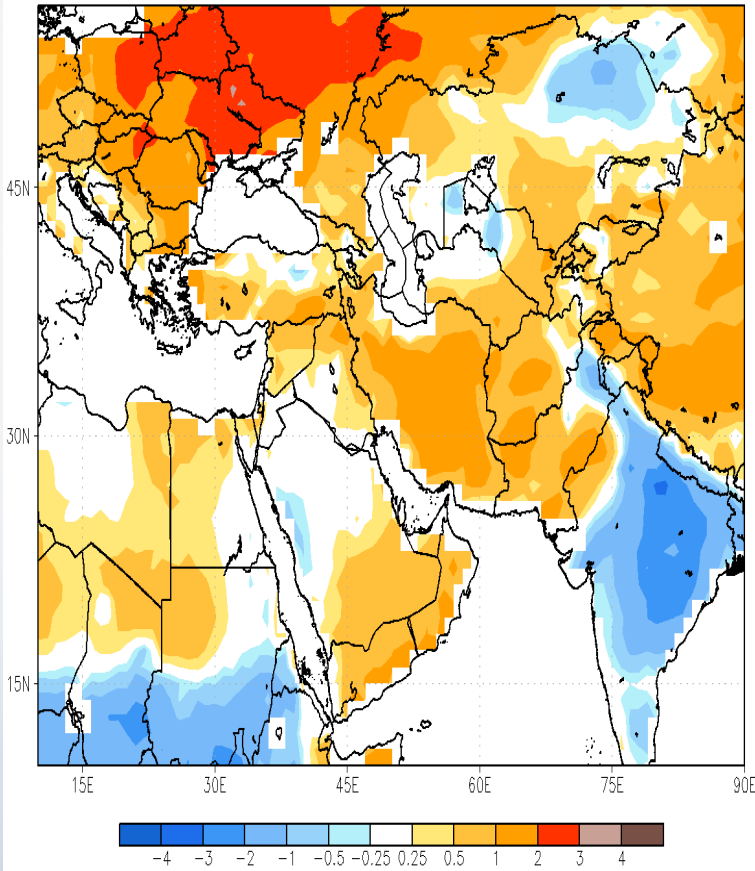


Fig 8. Seasonal forecast for June-August of 2024.

NASA_GEOSv2 2-Meter Air Temp. Anomalies (deg C)

Jun2025–Aug2025

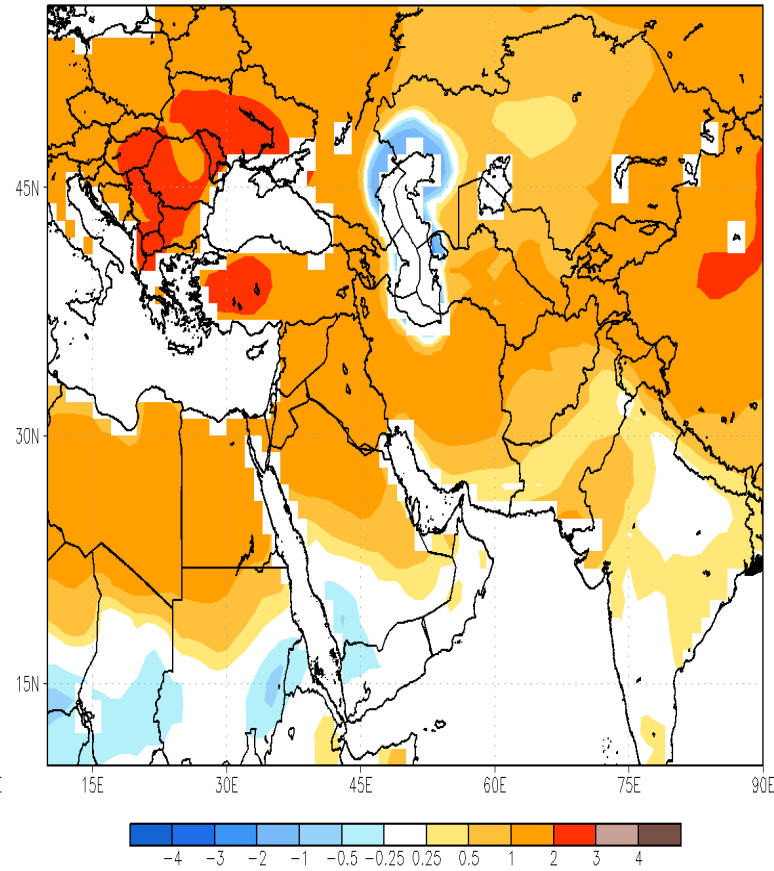
May2025 initial conditions



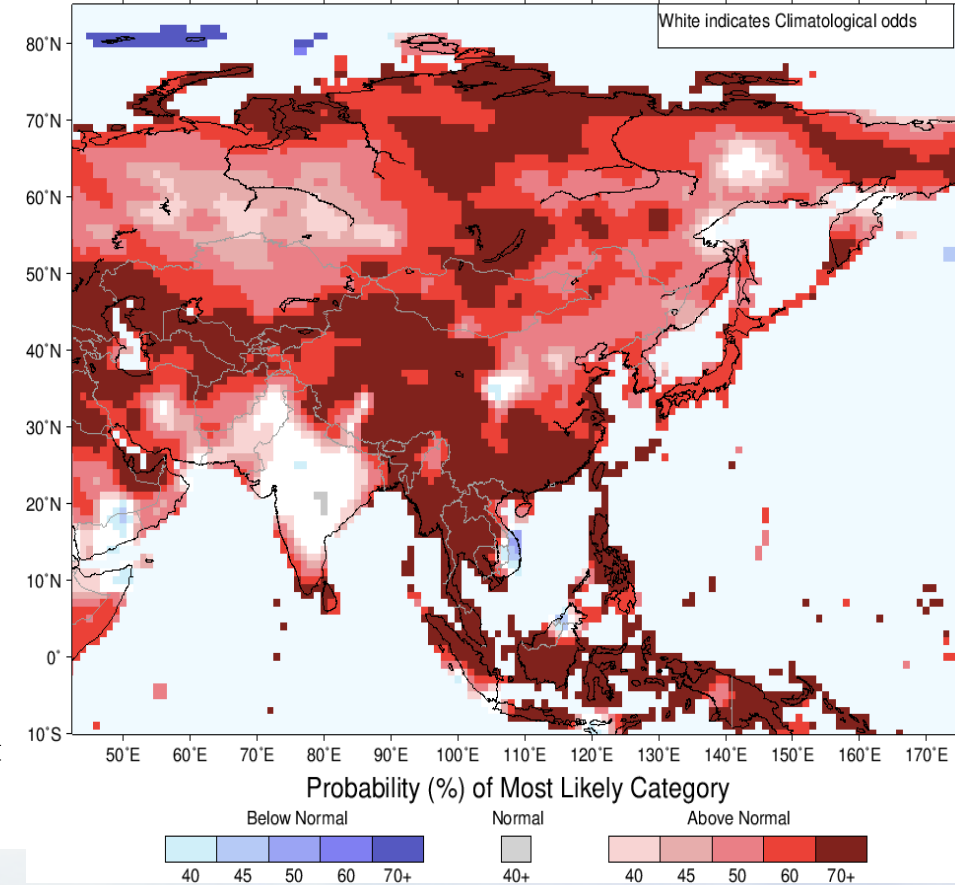
NCAR_CCSM4 2-Meter Air Temp. Anomalies (deg C)

May2025–Jul2025

April2025 initial conditions



IRI Multi-Model Probability Forecast for Temperature for June–July–August 2025, Issued May 2025



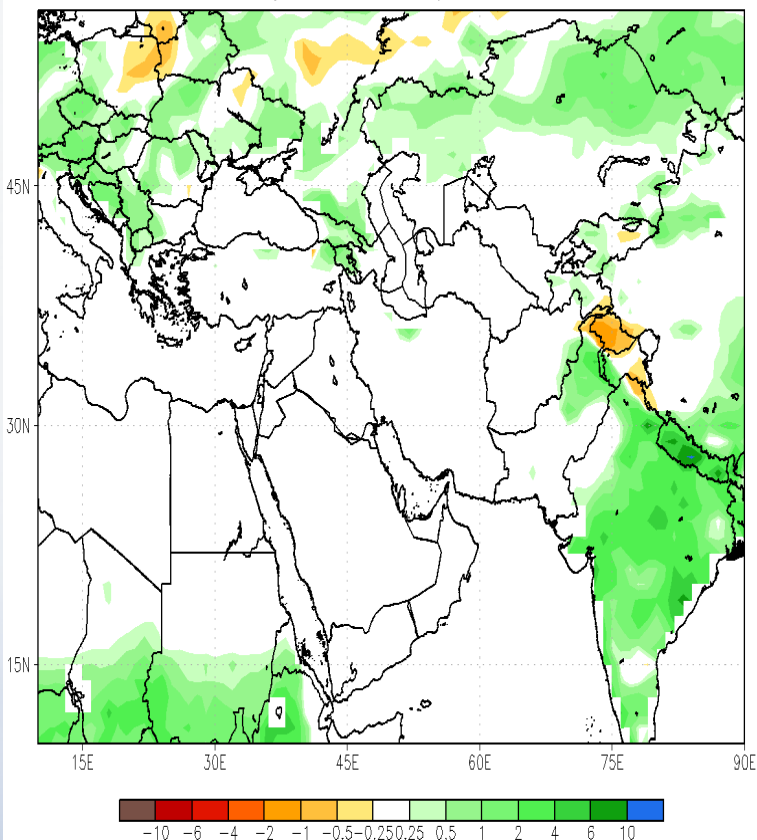
Based on NASA and CMC1 Model in Next three Months (June, July and August) Mean Temperature Variation will Likely to Remain 0.5 up to 1 C in North, East, North East, Southeast and some part of south. However Mean Temperature Variation will Likely to Remain 1 up to 2 C in Southwest, West, Northwest and some Central Part of the Country.

Based on IRI Model in Next three months (June, July and August) Temperature Variation will be 40 – 50 Percent all over Afghanistan

NASA_GEOS5v2 Precipitation Anomalies (mm/day)

Jun2025–Aug2025

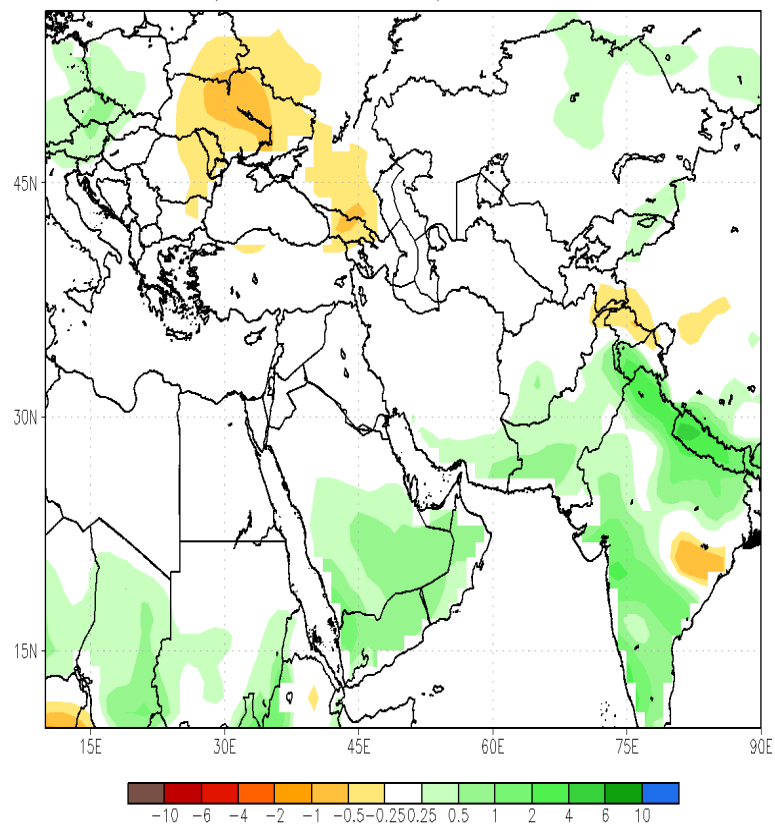
May2025 initial conditions



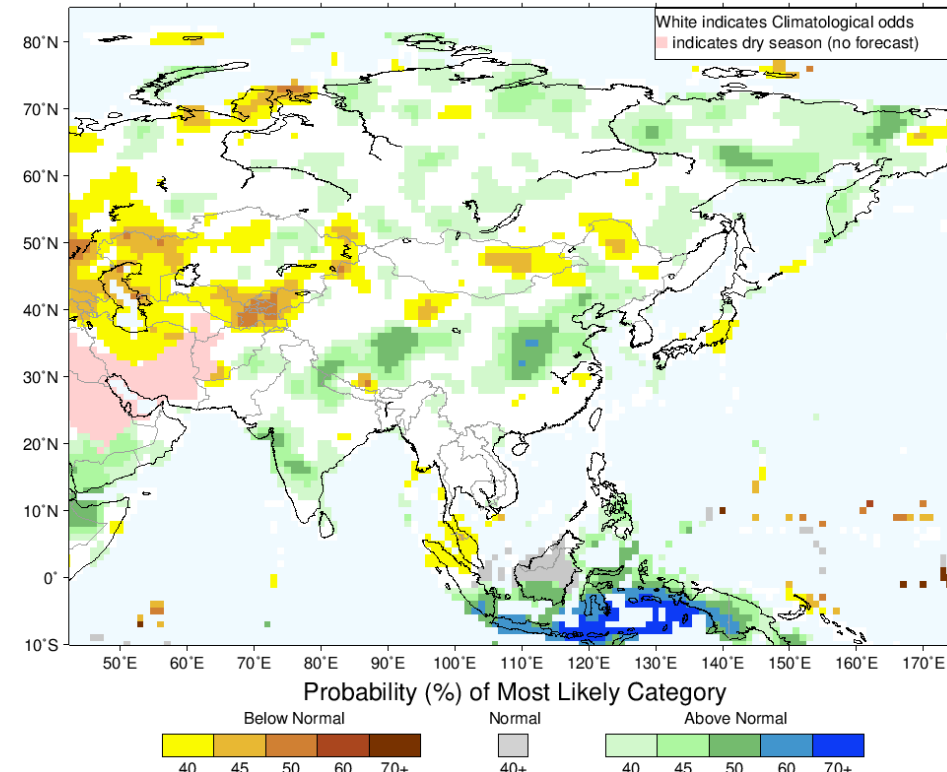
NCAR_CCSM4 Precipitation Anomalies (mm/day)

May2025–Jul2025

April2025 initial conditions



IRI Multi-Model Probability Forecast for Precipitation for June–July–August 2025, Issued May 2025



Based on NASA and CMC1 model precipitation in next three months (June, July and August) will be normal for the most of areas only some part of North, Northeast and East will be Below Normal, Some Part of South and Southeast will be Above Normal During these Months. three coming months.

Based on IRI Model Precipitation in Next three months (June, July and August) will be normal and some part of North, Northeast and East will be Below Normal, Some Part of South and Southeast will be Above Normal During these Months.

Extreme Weather Events Data During 2023

- Date: 18-April-2023
- On 18-April-2023, Afghanistan witnessed monsoon rains, the air masses entered the country from the west, and the rainfall, snowfall and milting covered the central regions, north and northeast parts, as well as the south and southeast regions of the country. Meteorological stations have been registered as follows.
- In the central areas, the amount of rainfall is (10 - 35) mm, and it has also snowed in the parts of Bamyan and Ghor province.
- Of the rainfall has been recorded in the east and southeast regions (10 - 30) mm, and Nuristan province has witnessed snowfall.
- of rainfall has been recorded in the northeast regions (7 - 20) mm.
- And in the south and southeast regions, its amount has been recorded as (10 - 30) mm.

Extreme Weather Events in 2024

Best on actual primary Reports ANDMA for 10-11 May 2024 in the Baghlan province.
Afghanistan Meteorology Department (AMD) issued warning for 10-11 May 2024 the Baghlan province in high, medium and low level warning.

NO	DISTRICT	KILLED	INJURED	HOUSES DAMAGED	HOUSES DESTROYE D
1	Puli khomri	15	5	100	150
2	Central Baghlan	55	75	1500	500
3	Nahrin			80	20
4	Barga	60	120	2000	500
5	jalga	4		50	20
6	Khost			39	33
7	Gozargah Noor	4		250	150
8	Dahani Ghorī	2	1	42	50
9	Tala o Barfak		3	5	10
		140	204	4066	1433

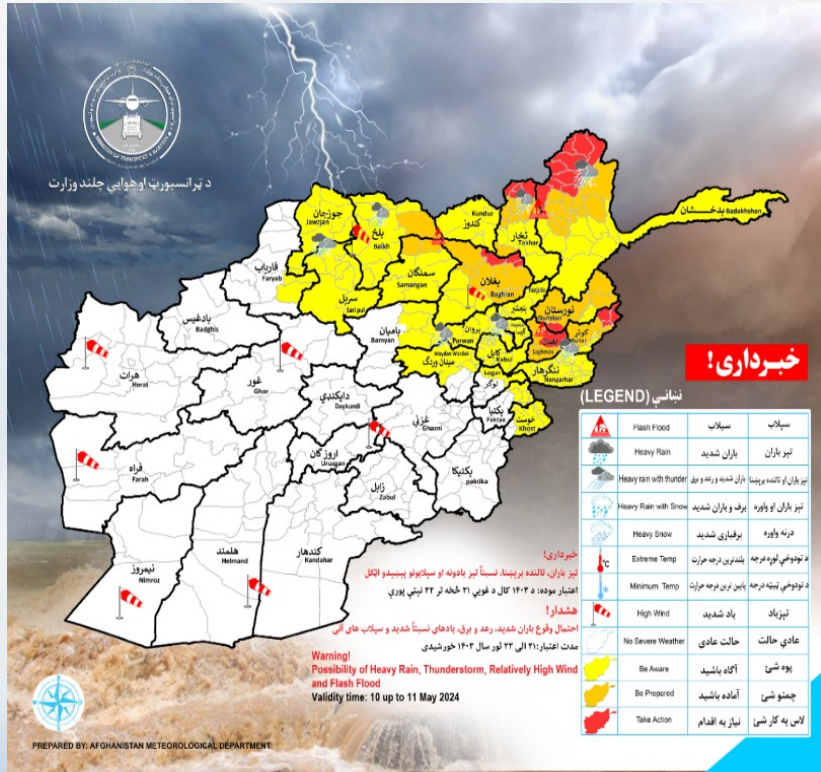
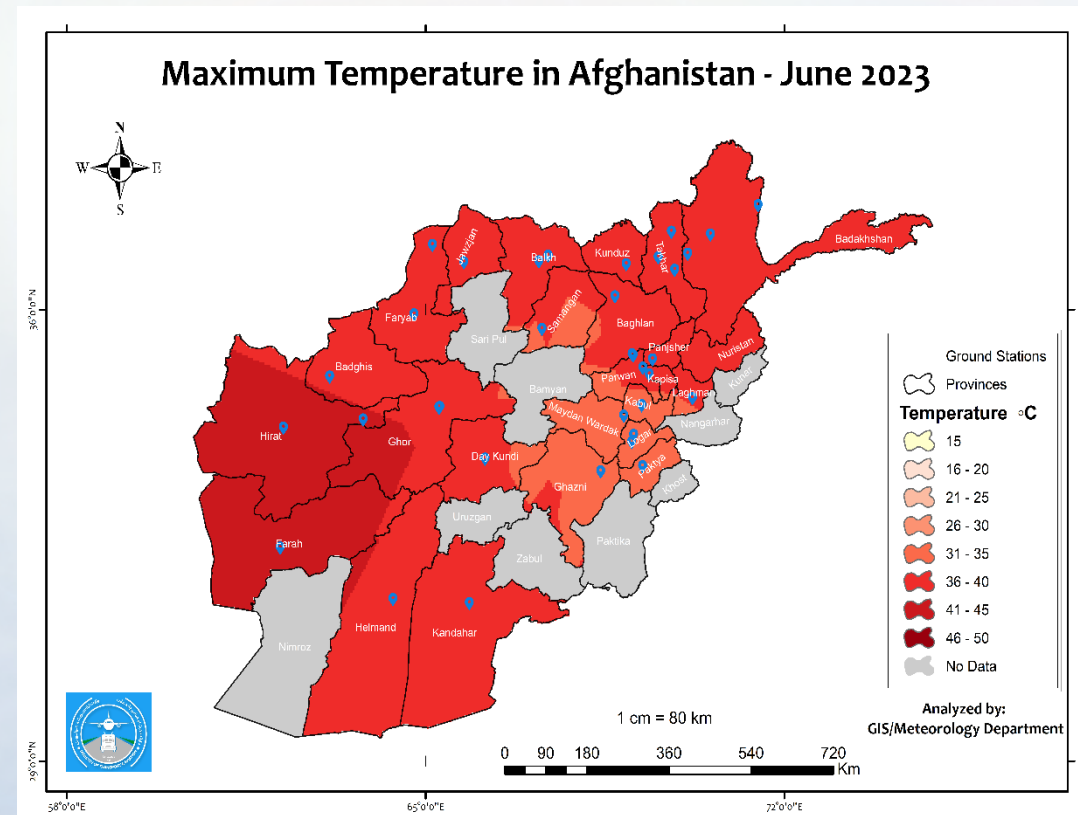
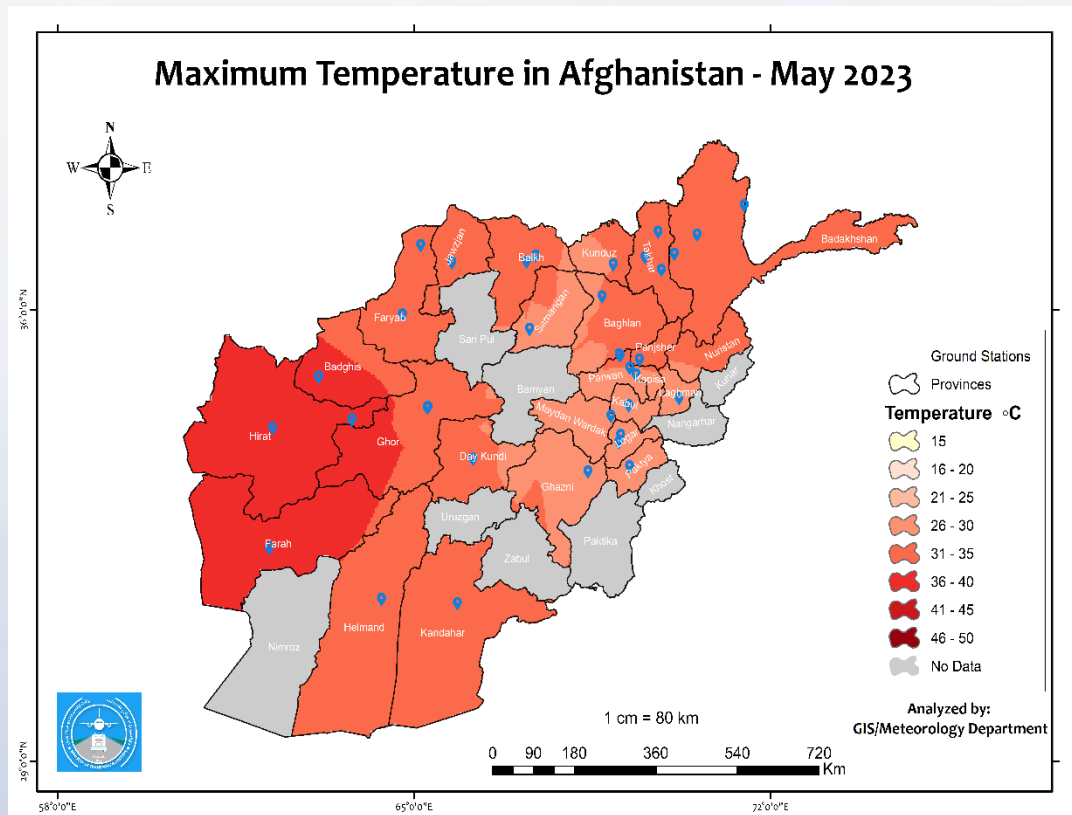


Fig 9. Flash flood warning of Forecast Department of AMD



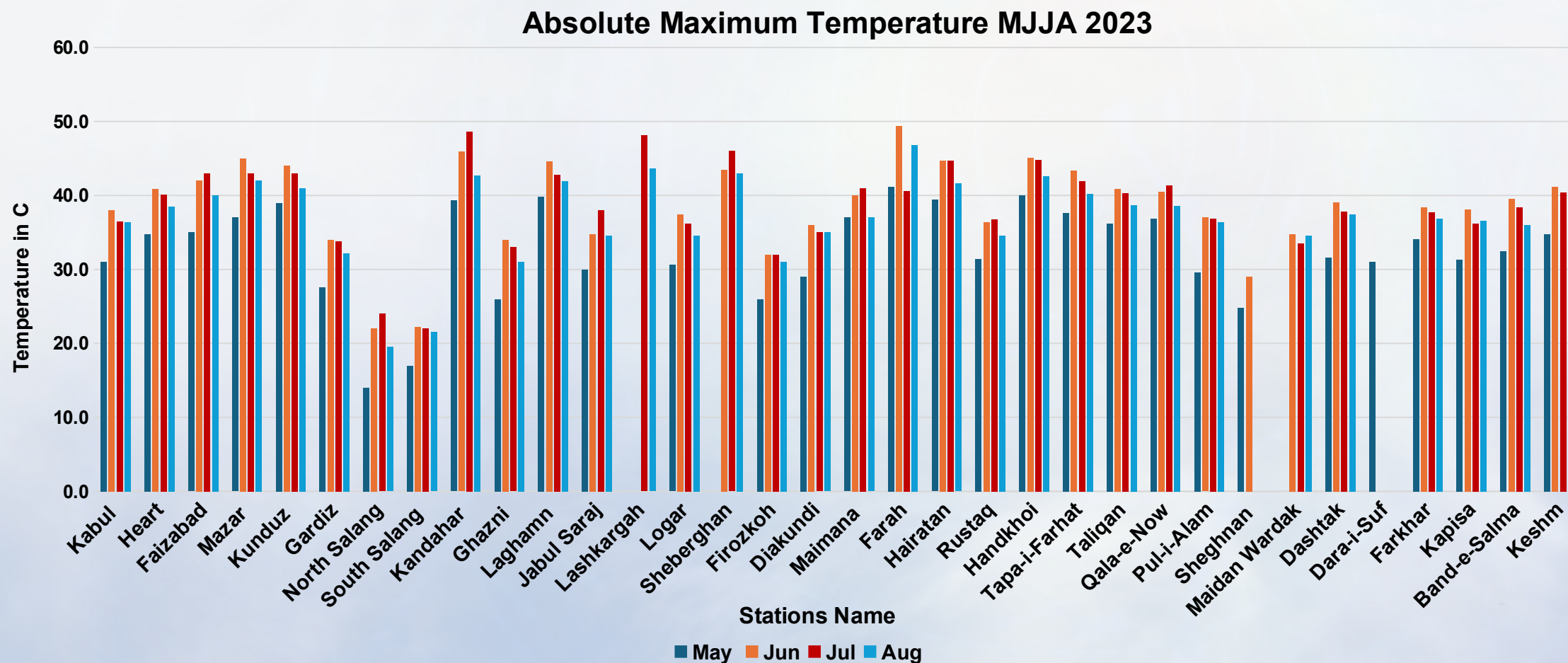


Absolute Maximum Temperature With Date



In both May & June months, the south west and west areas of the country recorded the highest temperature, specially in June it was more than 40+ °C .

Absolute Maximum Temperature With Date



This is the absolute maximum temperature with date for May, June, July and August 2023 that shows high temperature in Kandahar, Farah, Lashkargah, Laghman, Sheberghan, Kunduz, Faizabad... stations are above 40 °C degree.

Absolute Maximum Temperature With Date

Provinces	May	Jun	Jul	Aug
Kabul	31.0	38.0	36.5	36.4
Heart	34.8	40.9	40.1	38.5
Faizabad	35.0	42.0	43.0	40.0
Mazar	37.0	45.0	43.0	42.0
Kunduz	39.0	44.0	43.0	41.0
Gardiz	27.6	34.0	33.8	32.2
North Salang	14.0	22.0	24.0	19.5
South Salang	17.0	22.2	22.0	21.5
Kandahar	39.3	45.9	48.6	42.7
Ghazni	26.0	34.0	33.0	31.0
Laghamn	39.8	44.6	42.8	41.9
Jabul Saraj	30.0	34.8	38.0	34.6
Lashkargah			48.1	43.6
Logar	30.6	37.4	36.2	34.6
Sheberghan		43.5	46.0	43.0
Firozkoh	26.0	32.0	32.0	31.0
Diakundi	29.0	36.0	35.0	35.0
Maimana	37.0	40.0	41.0	37.0
Farah	41.2	49.4	40.6	46.8

Provinces	May	Jun	Jul	Aug
Hairatan	39.4	44.7	44.7	41.6
Rustaq	31.4	36.4	36.8	34.6
Handkhoi	40.0	45.1	44.8	42.6
Tapa-i-Farhat	37.6	43.4	41.9	40.2
Taliquan	36.2	40.9	40.3	38.7
Qala-e-Now	36.9	40.5	41.4	38.6
Pul-i-Alam	29.6	37.0	36.9	36.4
Sheghnan	24.8	29.0		
Maidan Wardak		34.8	33.5	34.6
Dashtak	31.6	39.1	37.8	37.4
Dara-i-Suf	31.0			
Farkhar	34.1	38.4	37.7	36.9
Kapisa	31.3	38.1	36.2	36.6
Band-e-Salma	32.5	39.5	38.4	36.0
Keshm	34.8	41.2	40.4	37.7

Data from Meteorological stations in the table shown that May, June, July and August of 2023 recoded the highest temperature in Afghanistan.

The highest temperature was recorded in Farah on 22 June was 49.4°C, Lashkargah on 03 July was 48.1°C, and Kandahar on 17 July was 48.6°C.

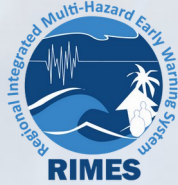


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SECTORAL ADVISORIES AND APPLICATIONS

- Delivering Seasonal forecast for the precipitation and temperature.
- Our seasonal forecast is not based on models that host by AMD we are just using CPT, Focus and some NASA Models to produce our seasonal forecast.
- Just for making an idea for the next three months



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TOOLS, PLATFORMS AND DATA USE

- Using CPT
- Use of regional data sources like SASCOF
- Using Observational Data from the Meteorological Stations



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CAPACITY AND GAPS

- Technical or institutional capacities currently in place (AMD has about 56 Active and Semi Active Meteorological Stations) Doesn't have any models to predict Climate situation and seasonal forecasts truly but we are preparing a Basic Bulletin About Climate using data from stations.
- just we have CPT and using it
- Key gaps or challenges (e.g., modeling capacity, user engagement, communication, funding) AMD have Data gap from all the stations (data gap from 1977-2005)
- Areas where regional cooperation or training is needed
- Data Gap Filling and Data Management
- Seasonal Forecast Models and Training
- Climate production and tools that host by AMD itself



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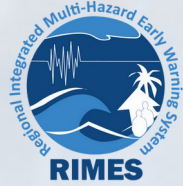


EXPECTATIONS FOR SAHF CS WG

According to Rimes Master Plan For 5 Years Support in buying Automatic and manual Stations and Spare parts for AMD

AMD Need Capacity Building in the following areas:

- Technician
- Meteorological Instruments and Equipment
- Observation and Data Quality Control
- Data Gap Filling and Data Managements
- Connecting Data into GTS (Global Telecommunication System)
- Weather Forecast
- Radar Meteorology
- Satellite Meteorology
- GIS
- Aviation Meteorology
- Research Methodology
- Research in Climate models and Climate Projections
- Seasonal Forecast
- Satellite Data Sharing from Afghanistan Region
- IT



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THANK YOU!