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Southwest monsoon rainfall Forecast for the second half of the season and for the month of August 2024

Highlights

- a) The rainfall over the entire country during the second half of the southwest monsoon season (August to September) 2024 is most likely to be above **normal (>106% of LPA)**.
- b) During the second half of the monsoon season, normal to above normal rainfall is most likely over most parts of the country except many parts of northeast and adjoining areas of east India, Ladakh, Saurashtra & Kutch, and some isolated pockets of central and peninsular India where below normal rainfall is likely.
- c) The monthly rainfall over the entire country for August 2024 is most likely to be within the **normal range (94 to 106 % of LPA)**.
- d) In August 2024, normal to above normal rainfall is likely over many parts of the country, except many areas in southern parts of central and adjoining northern peninsular India, northeast and adjoining areas of east India, some parts of northwest and south peninsular India, where below normal rainfall is likely.
- e) During August 2024, above-normal maximum temperatures are likely over most parts of the country, except for some areas in the Gangetic plains, central India, and the southeast coast of India, where normal to below-normal maximum temperatures are likely.
- f) Above-normal minimum temperatures are likely over most parts of the country except southeast Peninsular India, where normal to below-normal minimum temperatures are likely during August 2024.
- g) Currently, neutral El Nino-Southern Oscillation (ENSO) conditions are prevailing in the equatorial Pacific region. The latest forecasts from the Monsoon Mission Climate Forecasting System (MMCFs) and other climate models suggest that La Nina is likely to develop in the second half of the monsoon season towards end of August.
- h) Presently, neutral Indian Ocean Dipole (IOD) conditions are prevailing over the Indian Ocean. The climate models forecast indicates that these neutral IOD conditions are likely to continue until the end of the monsoon season.
- i) The IMD will issue the forecast for rainfall during September by the end of August 2024.

1. Background

Since 2021, the Indian Meteorological Department (IMD) has been providing monthly and seasonal operational forecasts for the southwest monsoon rainfall over the country. These forecasts are based on the Multi-Model Ensemble (MME) forecasting system, which utilizes coupled global climate models (CGCMs) from various global climate prediction and research centers, including IMD's Monsoon Mission Climate Forecasting System (MMCFS) model.

On 15th April 2024, IMD issued the first stage forecast for the 2024 southwest monsoon seasonal (June to September) rainfall over the country. An update to this forecast was issued on 27th May 2024. Additionally, IMD released the rainfall forecast specifically for June on May 27, 2024. Subsequently, the monthly outlook for rainfall during July 2024 was issued by IMD on 1st July 2024.

IMD has prepared an outlook for the rainfall during the second half of the Southwest monsoon season (August-September), 2024 and August 2024.

2. Probabilistic Forecast of Rainfall over the Country during August to September (Aug+Sep), 2024

The rainfall averaged over the entire country from August to September is likely to be **above normal (>106% of the Long Period Average (LPA))**. The LPA of rainfall over the country as a whole during the August to September period, based on historical data of 1971 to 2020 is about 422.8 mm.

The spatial distribution of probabilistic forecasts for the tercile categories (above normal, normal, and below normal) of rainfall during the August to September 2024 period is depicted in **Figure 1**. During the second half of the monsoon season, normal to above normal rainfall is most likely over most parts of the country except many parts of northeast and adjoining areas of east India, Ladakh, Saurashtra & Kutch, and some isolated pockets of central and peninsular India where below normal rainfall is likely.

3. Probabilistic Forecast for the Rainfall over the Country during August 2024

The rainfall averaged over the entire country for **August 2024 is most likely to be normal (94 to 106 % of LPA)**. The LPA of the rainfall over the country as a whole during August, based on data of 1971-2020 is 254.9 mm.

The spatial distribution of probabilistic forecasts for the tercile categories (above normal, normal, and below normal) of rainfall during August 2024 is illustrated in **Figure 2**. The normal to above normal rainfall is likely over many parts of the country, except many areas in southern parts of central and adjoining northern peninsular India, northeast and adjoining areas of east India, some parts of northwest and south peninsular India, where below normal rainfall is likely.

4. Probabilistic Forecast of Temperatures over the Country during August 2024

Figure 3a and Figure 3b display the forecast probabilities of maximum and minimum temperatures, respectively, for August 2024.

During August, above-normal maximum temperatures are likely over many parts of the country, except for some areas in the Gangetic plains, central India, and the southeast coast of India, where normal to below-normal maximum temperatures are likely (Figure 3a).

Similarly, above-normal minimum temperatures are likely over most parts of the country except southeast Peninsular India, where normal to below-normal minimum temperatures are likely during August 2024 (Figure 3b).

5. SST conditions in the Pacific and the Indian Oceans

Currently, neutral ENSO conditions are prevailing in the equatorial Pacific region. The latest forecasts from the Monsoon Mission Climate Forecasting System (MMCFS) and other climate models suggest that La Nina condition is likely to develop during the second half of the monsoon season towards end of August.

Apart from ENSO, other factors, such as Indian Ocean Sea Surface Temperatures (SSTs), also impact the Indian monsoon. Currently, neutral Indian Ocean Dipole (IOD) conditions are prevailing over the Indian Ocean. The climate model forecasts indicate that these neutral IOD conditions are likely to continue until the end of the monsoon season.

6. Extended Range Forecast and Short to Medium range forecast Services

The IMD also provides extended-range forecasts. It includes 7-day averaged forecasts of rainfall, maximum temperatures, and minimum temperatures over the country for the next four weeks. These forecasts are updated weekly and released on every Thursday. They are generated using the Multi-model Ensemble Dynamical Extended Range Forecasting System, which is currently operational in IMD. The forecasts can be accessed through the IMD website https://mausam.imd.gov.in/imd_latest/contents/extendedrangeforecast.php).

The extended range forecast is followed by a short to medium range forecast issued daily by IMD.

Tercile probability rainfall forecast for 2024 August to September season

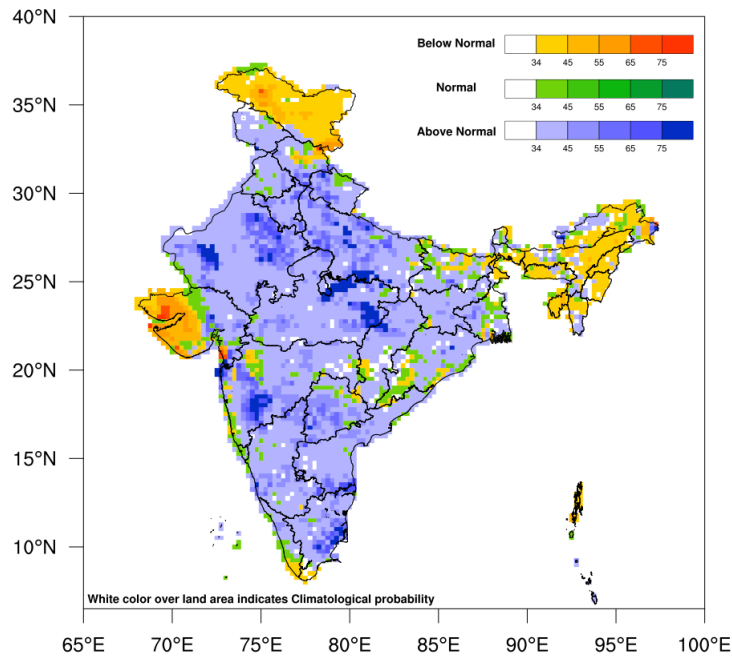


Fig.1. Probability Forecast of Tercile Categories of Rainfall over India during the Second Half (August to September) of the Southwest Monsoon Season, 2024. The figure illustrates the most likely tercile categories (below normal, normal, and above normal) of rainfall over India during the specified period, along with their corresponding probabilities. The model has no forecasting signal over the white shaded areas within the land region of the country. The probability is equally distributed among the tercile categories (33.33% each).

probability rainfall forecast for 2024 August

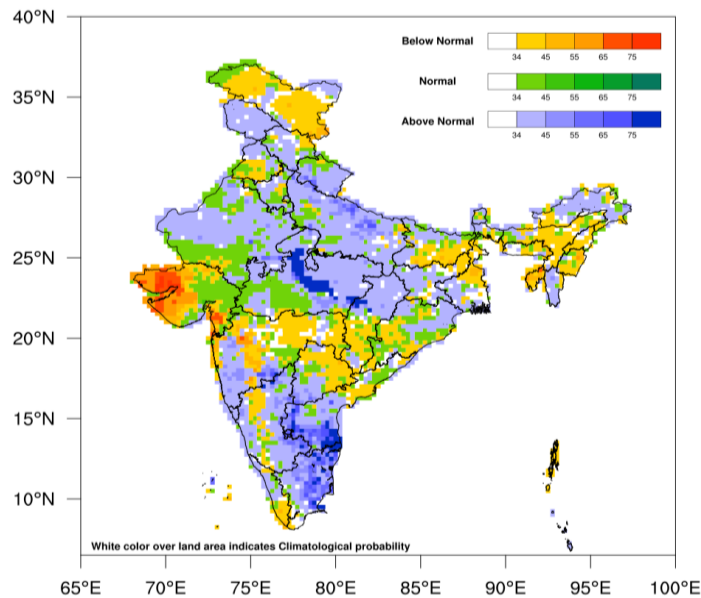


Fig.2. Probability Forecast of Tercile Categories of Rainfall over India during August, 2024. The figure illustrates the most likely tercile categories (below normal, normal, and above normal) of rainfall over India during the month of August, along with their corresponding probabilities. The model has no forecasting signal over the white shaded areas within the land region of the country. The probability is equally distributed among the tercile categories (33.33% each).

Maximum Temperature Outlook for August 2024

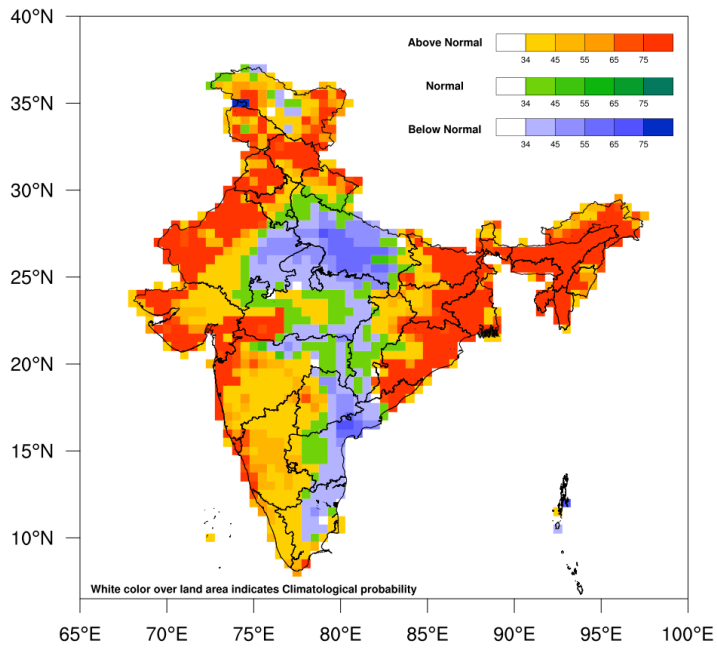


Fig.3a. Probability forecast of Maximum Temperature during August 2024.

Minimum Temperature Outlook for August 2024

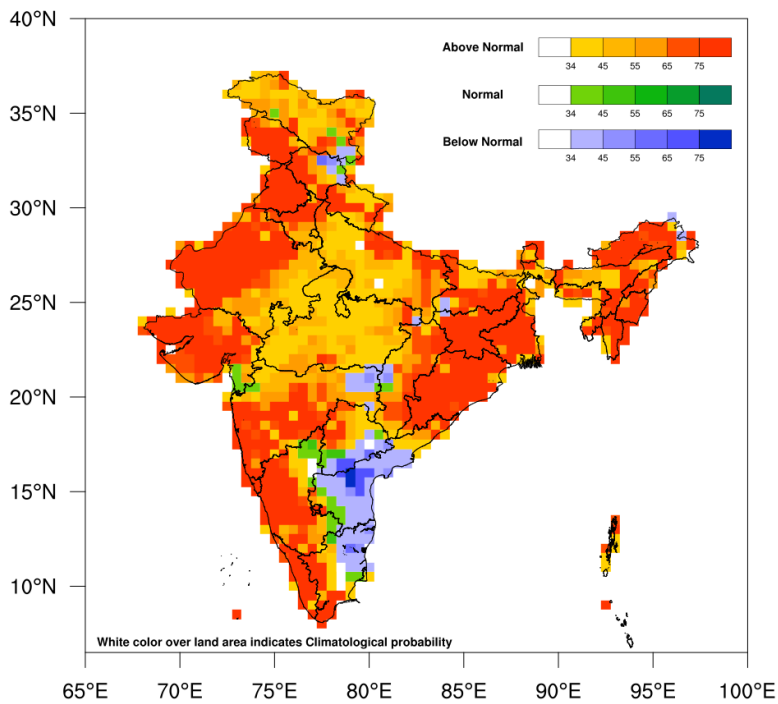


Fig.3b. Probability forecast of Minimum Temperature during August 2024.