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Forecast Outlook for the Rainfall during Second Half of the SW Monsoon Season (August – September) and Monthly Rainfall and Temperature during August, 2023

Highlights

- a)** Rainfall over the country as a whole during the second half (August to September period) of the southwest monsoon season, 2023 is very likely to be **normal (94 to 106% of Long Period Average (LPA)), most probably on the negative side of the normal** .
- b)** During the second half of the 2023 southwest monsoon season, normal to above normal rainfall is very likely over most parts of subdivisions adjacent to/ along the Himalays, east central India, and some parts of east and northeast India. Below normal rainfall is very likely over most parts of Peninsular India, and western parts of northwest and central India. .
- c)** The Monthly rainfall over the country as a whole for August 2023 is very likely to be **below normal (<94 % of Long Period Average (LPA))**.
- d)** During August 2023, normal to above normal rainfall is very likely over most parts of subdivisions adjacent to / along the Himalays, east central India, and some parts of east and northeast India. Below normal rainfall is very likely over most parts of South Peninsula, and many parts of western parts of northwest and central India.
- e)** During August, 2023, above normal monthly maximum temperatures are very likely over most parts of south Peninsula, east and northeast India, and many areas of western parts of northwest and central India. Normal to below normal maximum temperatures are most likely over some areas of north peninsular India, east central India and along the plains of Himalayas.
- f)** During August, above normal minimum temperatures are likely over most parts of India except some parts of the northwest India where below normal minimum temperatures are likely
- g)** Currently, weak El Niño conditions are prevailing over the equatorial Pacific region. The latest MMCFS and other climate model indicate that the El Niño conditions are likely to intensify further and continue upto early next year. At present neutral IOD conditions are prevailing over the Indian Ocean and the latest climate models forecast indicates that positive IOD conditions are likely to develop during remaining part of the monsoon season.

IMD will issue the forecast outlook for the monthly rainfall and temperatures for the September by end of August 2023.

1. Background

Since 2021, IMD has been issuing monthly and seasonal operational forecasts for the southwest monsoon rainfall and temperatures over the country based on the Multi-Model Ensemble (MME) forecasting system. The MME approach uses the coupled global climate models (CGCMs) from different global climate prediction and research centers including IMD's Monsoon Mission Climate Forecasting System (MMCFS) model.

IMD had issued the first stage forecast for the 2023 southwest monsoon seasonal (June to September) rainfall over the country on 11th April and update for the forecast on 26th May along with the forecast for the monthly rainfall and temperatures for June, and that for July 2023 was issued on 30th June.

IMD has now prepared an outlook for the rainfall during the second half (August+September) of the southwest monsoon season and the monthly rainfall and temperature for the month of August, 2023

2. Probabilistic Forecast of Rainfall over the Country during the Second Half of the Monsoon Season (August – September), 2023

The rainfall averaged over the country as a whole during second half of the monsoon season (August – September) **is most likely to be normal (94-106% of the long period average (LPA)), with a tendency to be on negative side of the normal.** The LPA of the rainfall over the country as a whole for the same period based on the data of 1971-2020 is 422.8 mm.

The spatial distribution of probabilistic forecasts for the tercile categories (above normal, normal, and below normal) of rainfall for the second half of the monsoon season, 2023 is shown in **Fig.1**. Normal to above normal rainfall is very likely over most parts of subdivisions adjacent to / along the Himalayas, east-central India, and some areas of east and northeast India. However, below normal rainfall is very likely over most areas of Peninsular India, and western parts of northwest and central India. The white shaded areas within the land region represent climatological probabilities.

3. Probabilistic Forecast for the Rainfall over the Country during August 2023

The rainfall averaged over the country as a whole during August, 2023 **is very likely to be below normal (<94% of LPA).** The LPA of the August rainfall over the country as a whole 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, 2023 is shown in Fig.2. Normal to above normal rainfall is very likely over most parts of subdivisions adjacent to / along the Himalays, east central India, and some areas of east and northeast India. Below normal rainfall is very likely over most parts of South Peninsula, and many parts of western side of northwest and central India. The white shaded areas within the land region represent climatological probabilities.

4. Probabilistic Forecast of Temperatures over the Country during August 2023

Fig.3a and Fig.3b show forecast probabilities of the maximum and minimum temperatures during August 2023 respectively.

Above normal monthly maximum temperatures are very likely over most parts of south Peninsula, east and northeast India, and many areas of western side of northwest and central India. Normal to below normal maximum temperatures are very likely over some areas of north peninsular India, east central India and some parts of Gangetic plains. (**Fig.3a**). The white shaded areas within the land region represent climatological probabilities.

The above normal minimum temperatures are likely over most parts of the country except some parts of the northernmost India where below normal minimum temperatures are likely (**Fig. 3b**).

5. SST conditions in the Pacific and the Indian Oceans

Currently, weak El Niño conditions are prevailing over the equatorial Pacific region. The latest MMCFS and other climate forecasts indicate that the El Niño conditions are likely to further intensify and continue up to early next year.

In addition to ENSO conditions over the Pacific, other factors such as the Indian Ocean Sea Surface Temperatures (SSTs) also influence on Indian monsoon. At present neutral Indian Ocean Dipole (IOD) conditions are prevailing over the Indian Ocean and the latest climate model forecast indicates that positive IOD conditions are likely to develop during remaining part of the monsoon season.

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

IMD also provides extended range forecasts (7–day averaged forecasts for the next four weeks) of rainfall and maximum & minimum temperatures over the country updated every week on Thursday. This is based on the Multi-model ensemble dynamical Extended Range Forecasting System currently operational at IMD. The forecasts are available 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.

probability rainfall forecast for 2023 Aug+Sep

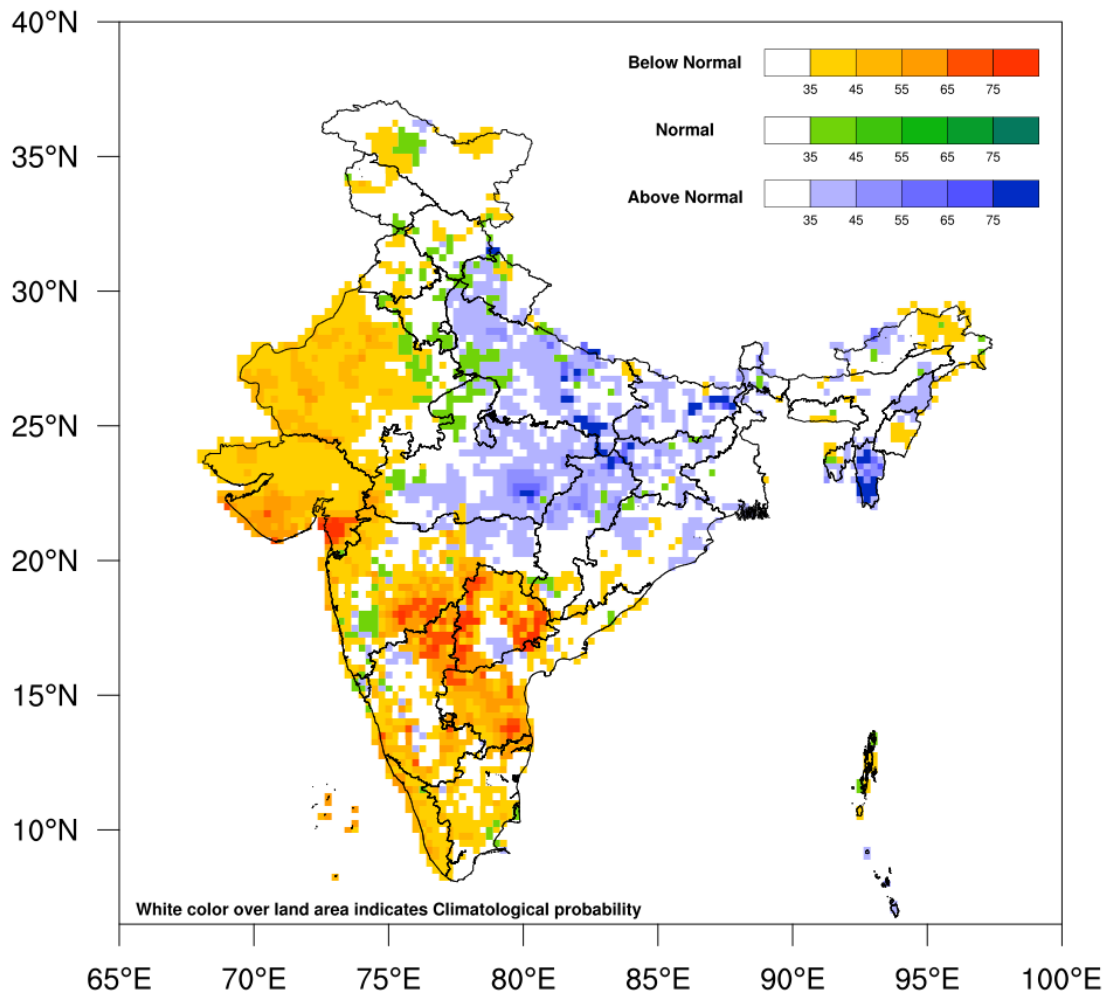


Fig.1. Probability forecast of tercile categories* (below normal, normal, and above normal) of rainfall over India during the second half (August to September) of southwest monsoon season, 2023. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area represent climatological probabilities. (*Tercile categories have equal climatological probabilities, of 33.33% each).

probability rainfall forecast for 2023 August

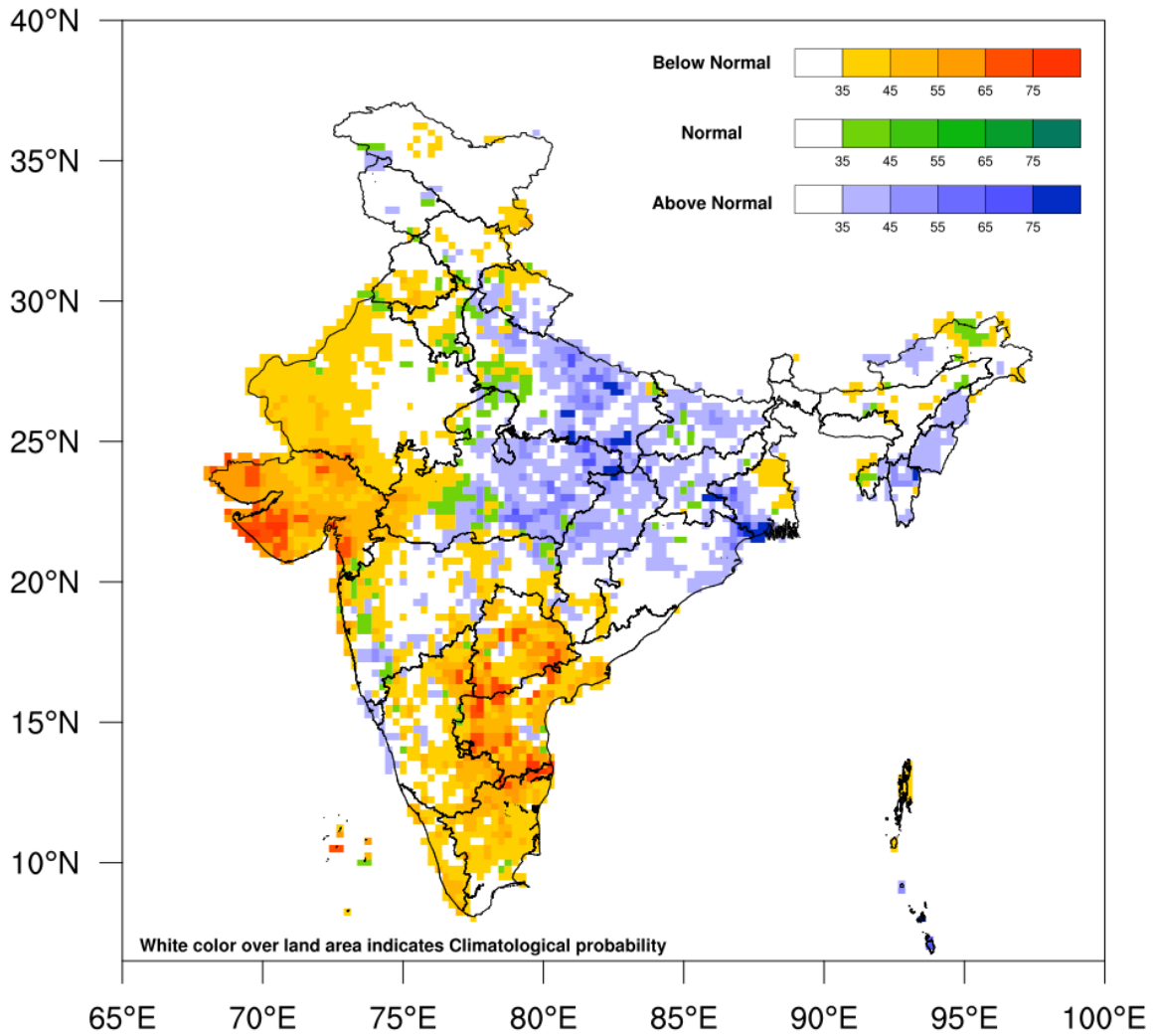


Fig.2. Probability forecast of tercile categories* (below normal, normal, and above normal) of rainfall over India during August, 2023. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area represent climatological probabilities. (*Tercile categories have equal climatological probabilities, of 33.33% each).

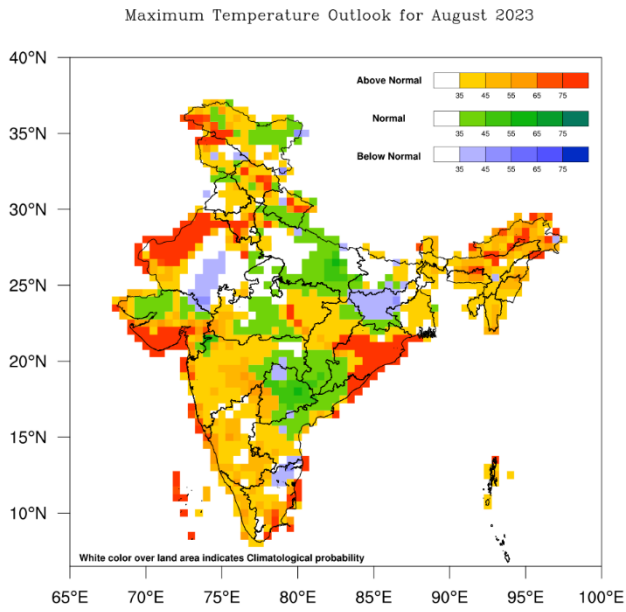


Fig.3a. Probability forecast of Maximum Temperature during August 2023. The white shaded areas represent climatological probabilities.

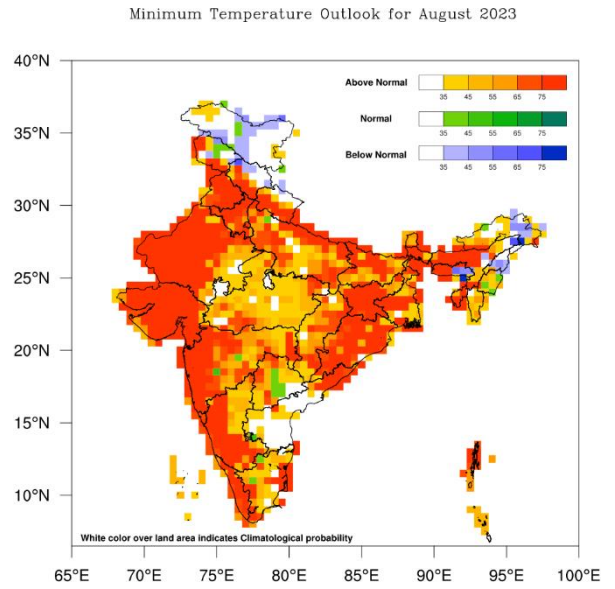


Fig.3b. Probability forecast of Minimum Temperature during August 2023. The white shaded areas represent climatological probabilities.