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INDIA METEOROLOGICAL DEPARTMENT

**Outlook for the Seasonal Temperatures During the Hot Weather Season (March to May)
and Monthly Rainfall and Temperatures During March: 2024**

Highlights

- During the upcoming hot weather season (March to May (MAM)), above-normal maximum temperatures are most likely over most parts of the country, except over some isolated areas of Northwest, Northeast, Central and Peninsular India where normal to below-normal maximum temperatures are most likely.
- During the season (MAM), above-normal minimum temperatures are most likely over most parts of the country.
- Monthly maximum temperatures for March 2024 are most likely to be above normal over most areas of Peninsula, Northeast and West Central India and many areas of North west India. On the other hand, normal to below normal maximum temperatures are most likely over most parts of East and Eastcentral India and some parts of Northwest India.
- Above normal monthly (March 2024) minimum temperatures are likely over most parts of the country except some isolated areas along the Himalayas where normal to below normal minimum temperatures are most likely.
- During MAM 2024, above-normal number of heatwave days are likely over most parts of the country except over Northeast India, Western Himalayan Region, Southwest Peninsula and West coast.
- During March, 2024, above-normal heatwave days are likely over most areas of northeast Peninsular India, many areas of Maharashtra and some areas of Odisha and adjoining areas.
- The rainfall during March 2024 averaged over the country as whole is most likely to be above normal (>117% of LPA). Normal to above-normal rainfall is likely over most parts of the country except over extreme southeastern areas of South Peninsula and some areas of Northeast and extreme Northwest India where below-normal rainfall is likely.

Seasonal (March to May) and Monthly (March) 2024 Outlook for the Temperature and Rainfall

1. Background

Since 2016, the India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) has been issuing seasonal forecast outlooks for temperatures over the country for both the hot and cold weather seasons. IMD also continuously works to improve the skill of forecasting models. The current strategy is based on the newly developed Multi-Model Ensemble (MME) based forecasting system. The MME approach uses the coupled global climate models (CGCMs) from different global climate prediction and research centers including IMD/MoES Monsoon Mission Climate Forecast System (MMCFS) model. IMD has now prepared seasonal and monthly temperature forecast outlooks over the country for the upcoming hot weather season (March to May 2024) and for March 2024. The same are presented below in the sections 2(a) and 2(b) respectively.

Heat Wave over a location refers to a prolonged period of excessively hot weather (above certain threshold temperature value) over the location. The heatwave outlook for the hot weather season (MAM) over the country is presented in section 3.

The monthly outlook for rainfall and temperatures for March 2024 are presented in section 4.

2. (a) Seasonal Temperature Outlook for March to May (MAM) 2024

Fig.1a and Fig.1b show forecast probabilities of the maximum and minimum temperatures respectively for March to May (MAM) 2024 season. The probability forecast for maximum temperatures (Fig.1a) indicates that above-normal maximum temperatures are most likely over most parts of the country, except over some isolated areas of Northwest, Northeast, Central and Peninsular India where normal to below-normal maximum temperatures are most likely.

The probability forecast for minimum temperatures (Fig.1b) indicates that during the during the season (MAM), above-normal minimum temperatures are most likely over most parts of the country.

2. (b) Monthly Temperature Outlook for March 2024

Fig.2a and Fig.2b show forecast probabilities of the maximum and minimum temperatures respectively for March 2024. During March 2024, above normal maximum temperatures are most likely over most areas of Peninsula, Northeast and West Central India and many areas of North west India. On the other hand, normal to below normal maximum temperatures are most likely over most parts of East and Eastcentral India and some parts of Northwest India (Fig. 2a)

During March 2024, above normal monthly minimum temperatures are likely over most parts of the country except some isolated areas along the Himalayas where normal to below normal minimum temperatures are most likely (Fig.2b).

3. Heat Wave outlook for the Hot Weather Season (March to May) and for the Month of March 2024

The anomaly (deviation from normal) forecast for the number of heatwave days in the country for March to May 2024 is shown in Fig. 3a. During MAM 2024, above-normal number of heatwave days are likely over most parts of the country except over Northeast India, Western Himalayan Region, Southwest Peninsula and West coast.

The anomaly forecast for the number of heatwave days in the country for March 2024 is shown in Fig. 3b. During March, 2024, above-normal heatwave days are likely over most areas of Northeast Peninsular India, many areas of Maharashtra and some areas of Odisha and adjoining areas.

4. Monthly Rainfall outlook for March 2024

The rainfall during March 2024 averaged over the country is most likely to be above normal (>117% of LPA). The LPA of rainfall over the country during March based on data from 1971 to 2020 is about 29.9 mm.

The probabilistic forecast for the spatial distribution of tercile rainfall categories (above normal, normal, and below normal) over the country for March 2024 is shown in Fig.4. The forecast suggests that normal to above-normal rainfall is likely over most parts of the country, except over extreme southeastern areas of South Peninsula and some areas of Northeast and extreme Northwest India where below-normal rainfall is likely. The dotted areas in the map climatologically receive very less rainfall during March and the white-shaded areas within the land areas represent climatological probabilities.

5. SST Conditions over the Pacific and the Indian Oceans

Currently, El Niño conditions are prevailing over the equatorial Pacific, and the sea surface temperatures (SSTs) are warmer than normal over most of the equatorial Pacific Ocean. The latest MMCFS forecast indicates that El Niño conditions are likely to weaken during the upcoming season and turn to neutral thereafter.

At present, neutral Indian Ocean Dipole (IOD) conditions persist over the Indian Ocean, and the latest MMCFS forecast indicates a continuation of these neutral IOD conditions during the upcoming season.

6. Extended Range Forecast and short to medium-range forecasting 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 a medium-range forecast issued daily by IMD.

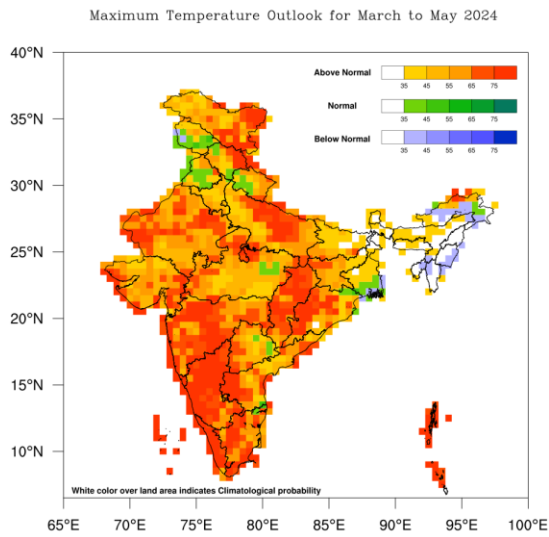


Fig.1a. Probability forecast of Maximum Temperature for March to May 2024.

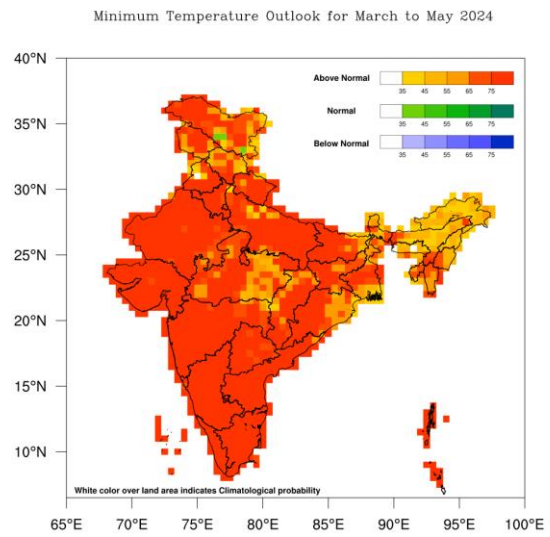


Fig.1b. Probability forecast of Minimum Temperature for March to May 2024.

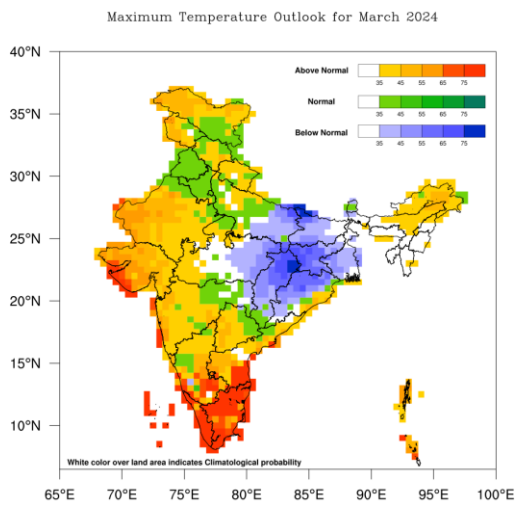


Fig.2a. Probability forecast of Maximum Temperature for March 2024.

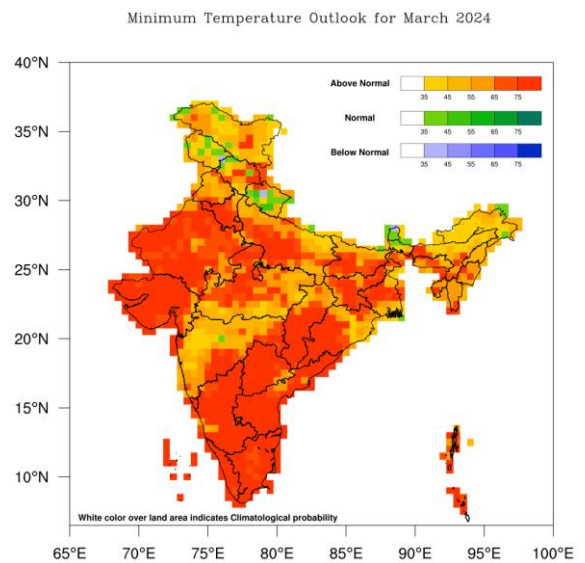


Fig.2b. Probability forecast of Minimum Temperature for March 2024.

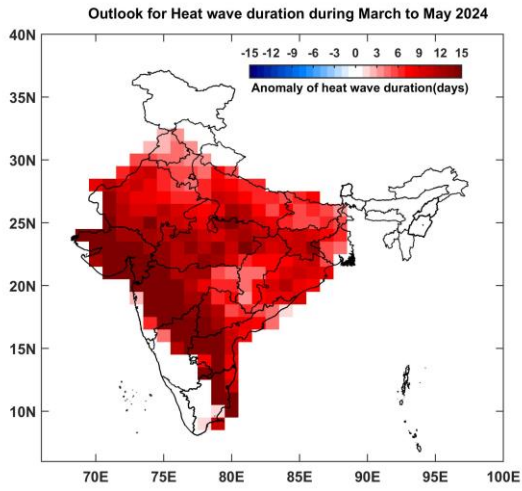


Fig3a. Probability forecast of heatwave events for the season March to May 2024.

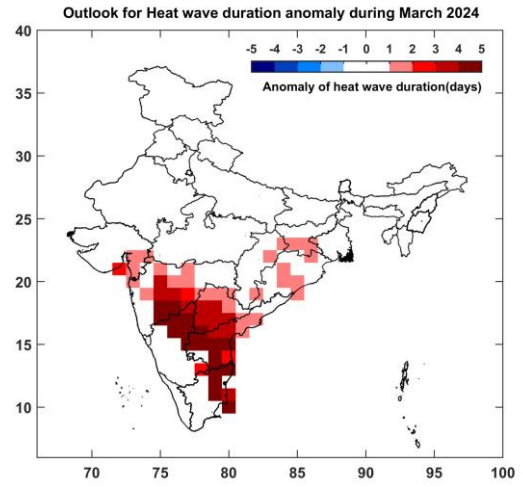


Fig3b. Probability forecast of heatwave events for March 2024.

probability rainfall forecast for March 2024

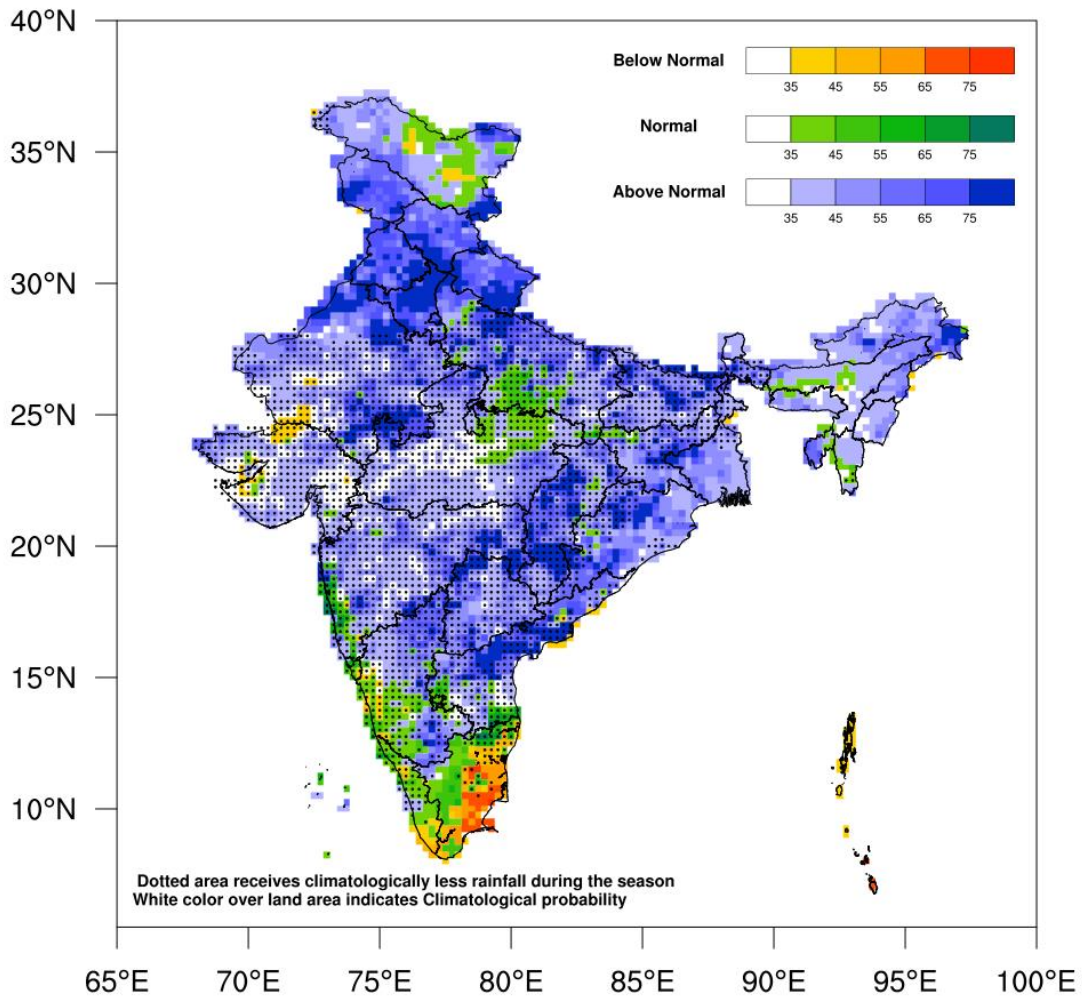


Fig.4. Probability forecast of tercile categories^{*} (below normal, normal, and above normal) for the rainfall over India during March 2024. The figure illustrates the most likely categories as well as their probabilities. The dotted area shown in the map climatologically receives very less rainfall and the white-shaded areas within the land areas represent climatological probabilities. (^{*}Tercile categories have equal climatological probabilities, of 33.33% each).