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Monthly outlook for rainfall and temperature during February 2023

Highlights

1. Monthly rainfall for 2023 February over Northwest India consisting of seven meteorological subdivisions (East Uttar Pradesh, West Uttar Pradesh, Uttarakhand, Haryana, Chandigarh & Delhi Punjab, Himachal Pradesh, Jammu Kashmir & Ladakh) is most likely to be normal (89-112 % of Long Period Average (LPA)). Monthly rainfall over the country as a whole during February 2023 is most likely to be normal (82-119 % of Long Period Average (LPA)). Below-normal rainfall is most likely over most parts of northeast, east and east central India and many parts of northwest India. Normal to above normal rainfall is very likely over most parts of south peninsular India, many parts of west central India and isolated pockets of the northwest India.
2. During February 2023, monthly minimum temperatures are most likely to be normal to below normal over most parts of the country except northeast and adjoining east India, northern parts of west coast and some parts of northwest India, where it is most likely to be above normal.
3. Monthly maximum temperatures for February 2023 are likely to be below-normal over most parts of peninsular and some parts of central India. Above-normal maximum temperatures are very likely in most parts of east and northeast India, east central India and some parts of northwest and west central India. Normal maximum temperatures or climatological probabilities are likely over remaining parts of the country.

Monthly outlook for rainfall and temperature during February 2023²

1. Background

Northwest India consisting of seven meteorological subdivisions (East Uttar Pradesh, West Uttar Pradesh, Uttarakhand, Haryana, Chandigarh & Delhi, Punjab, Himachal Pradesh, Jammu Kashmir & Ladakh) receives about 18% of its annual rainfall from January to March. Jammu Kashmir & Ladakh in particular receive about 31% of their annual rainfall during this period. The winter rainfall is very much crucial for Rabi crops over the region. It is also crucial for the water management of the region. Because of these reasons, India Meteorological Department (IMD) has been issuing long-range forecast outlooks for the winter rainfall over Northwest India. IMD also continuously works to improve the skill of forecasting models. The current strategy is based on the newly developed Multi-Model Ensemble (MME) technique. 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 prepared the monthly outlook for rainfall for the February of 2023 as mentioned below and the same is presented in section 2.

- a. Probabilistic forecast for the February 2023 rainfall averaged over Northwest India.
- b. Probabilistic forecast for the February 2023 rainfall averaged over India.
- c. Spatial distribution of probabilistic rainfall forecasts over the country for February 2023.

Since 2016, India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) has been issuing seasonal forecast outlooks for temperatures over the country for both hot and cold weather seasons. IMD has prepared monthly temperature outlook for February 2023 over the country and the same is presented in section 3.

2. Probabilistic Forecast for the rainfall during February 2023.

The 2023 February rainfall averaged over Northwest India is most likely to be normal (89-112 % of LPA). The LPA of rainfall over Northwest India during February based on the data of 1971-2020 is about 65.0 mm. Monthly rainfall over the country as a whole during February 2023 is most likely to be normal (82-119 % of LPA). The LPA of rainfall over the country as a whole during February based on data from 1971-2020 is about 22.7 mm

The probabilistic forecast for the spatial distribution of tercile rainfall categories (above normal, normal, and below normal) over the country for February 2023 is shown in Fig.1. The forecast suggests that below normal rainfall is most likely over most parts of northeast, east and east central India and many parts of northwest India. Normal to above normal rainfall is very likely over most parts of south peninsular India, many parts of west central India and isolated pockets of the Northwest India. Climatological probabilities are likely over the remaining areas of the country. The dotted areas in the map climatologically receive very less rainfall during the month and the white-shaded areas within the land areas represent climatological probabilities.

3. Probabilistic Temperature Forecast for February 2023³

Fig.2 and Fig.3 show forecast probabilities of the minimum and maximum temperatures respectively for February 2023. The probability forecast for the minimum temperatures indicates that during February 2023, minimum temperatures are most likely to be normal to below normal over most parts of the country except northeast and adjoining east India, northern parts of west coast and some parts of northwest India, where it is most likely to be above normal. Climatological probabilities (indicated by white-shaded areas) are predicted over the remaining areas of the country.

The probability forecast for the maximum temperatures (Fig.3) indicates that during February 2023, below-normal maximum temperatures are likely over most parts of peninsular and some parts of central India. Above-normal maximum temperatures are very likely in most parts of east and northeast India, east central India and some parts of northwest and west central India. Normal maximum temperatures or climatological probabilities (indicated by white-shaded areas) are predicted over the remaining areas of the country.

4. SST conditions in the Pacific and the Indian Oceans

Currently, La Niña conditions are prevailing over the equatorial Pacific region. The latest MMCFS forecast is indicating that these La Niña conditions are likely to weaken in the coming months.

At present, neutral IOD conditions are prevailing over the Indian Ocean and the latest MMCFS forecast indicates that the neutral IOD conditions are likely to continue during the entire forecast period.

5. 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 the short to medium-range forecast issued daily by IMD.

probability rainfall forecast for 2023 February

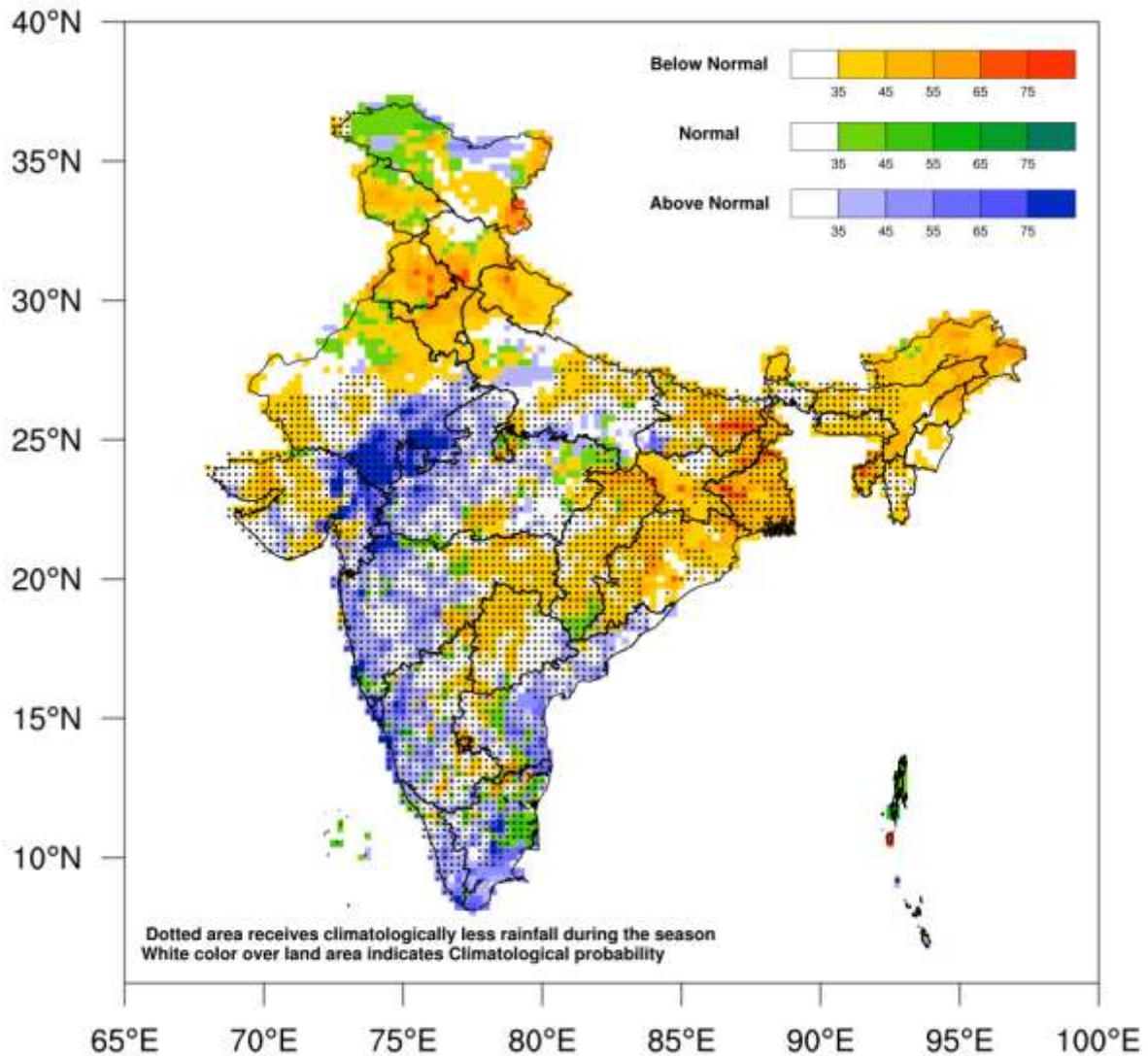


Fig.1. Probability forecast of tercile categories* (below normal, normal, and above normal) for the rainfall over India during February 2023. The figure illustrates the most likely categories as well as their probabilities. The dotted area shown in the map climatologically receives very less rainfall during February and the white-shaded areas within the land areas represent climatological probabilities. (*Tercile categories have equal climatological probabilities, of 33.33% each).

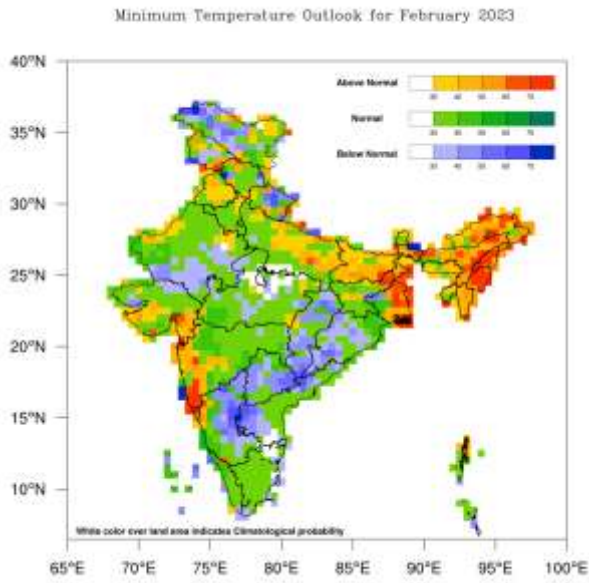


Fig 2. Probability forecast of Minimum Temperature for February 2023.

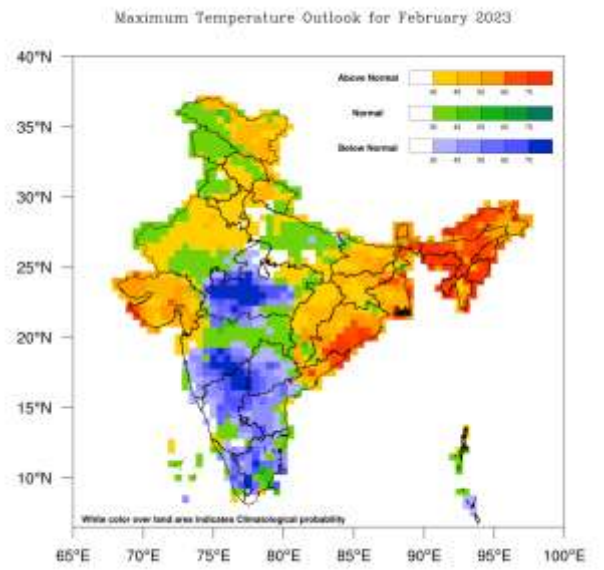


Fig 3. Probability forecast of Maximum Temperature for February 2023.