PRESS RELEASE

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भारत सरकार

Government of India

पृथ्वी विज्ञान मंत्रालय (एम. ओ. ई. एस.)

Ministry of Earth Sciences (MoES)

भारत मौसम विज्ञान विभाग

INDIA METEOROLOGICAL DEPARTMENT

Rainfall Forecast for January to March (JFM) 2023 and monthly outlook for rainfall and temperature during January 2023

Highlights

a) During the upcoming winter season (January to March 2023) the rainfall over the Northwest India consisting of seven meteorological subdivisions (East Uttar Pradesh, West Uttar Pradesh, Uttarakhand, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir and Ladakh) is most likely to be below normal (<86 % of Long Period Average (LPA)).

b) Monthly rainfall for January 2023 over the Northwest India consisting of seven meteorological subdivisions (East Uttar Pradesh, West Uttar Pradesh, Uttarakhand, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir and Ladakh) is most likely to be below normal (<78 % of Long Period Average (LPA)). Monthly rainfall over the country as a whole during Janury 2023 is most likely to be below normal (< 82 % of Long Period Average (LPA)). Below-normal rainfall is most likely over most parts of the country except many parts of south peninsular India and some pockets of the central India where above normal to normal rainfall is likely.

c) During January 2023, monthly minimum temperatures are most likely to be below-normal over many parts of central India and adjoining areas of peninsular, east and northwest India. Above normal to normal minimum temperatures are most likely over southern parts of south Peninsula, many parts of northeast India and some parts of northwest India.

d) Monthly maximum temperatures for January 2023 are likely to be below normal over many parts of the central and peninsular India. Above normal maximum temperatures are likely over most parts of northeast India and some parts of northwest, east and eastcentral India.

Rainfall Forecast for January to March (JFM) period and monthly outlook for rainfall and temperature during January 2023

1. Background

Northwest India consisting of seven meteorological subdivisions (East Uttar Pradesh, West Uttar Pradesh, Uttarakhand, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir and Ladakh) receives about 18% of its annual rainfall from January to March. Jammu & Kashmir and Ladakh in particular receive about 31% of their annual rainfall during this period. The winter rainfall is very 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 forecast is based on the newly developed Multi-Model Ensemble (MME) technique introduced since monsoon season of 2021. 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 the forecast outlook for the rainfall during the January to March (JFM) period and for January, 2023. The following forecasts are presented in section 2.

a. Probabilistic forecasts for the winter season (January to March 2023) rainfall averaged over Northwest India consisting of seven meteorological subdivisions.
b. Probabilistic forecast for monthly rainfall during January 2023 averaged over Northwest India.
c. Spatial distribution of probabilistic rainfall forecasts over the country during January to March 2023 and January 2023.

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 hot and cold weather seasons. On 1st December 2022 IMD issued the seasonal forecast for the temperatures for the December to February (DJF) season. As additional information, IMD has now prepared a monthly temperature outlook for January 2023 over the country and the same is presented in section 3.

2. (a) Probabilistic Forecast for the Rainfall during JFM 2023

The rainfall during January-March (JFM) 2023 averaged over Northwest India is most likely to be below normal (<86% of the Long-Period Average (LPA)). The LPA of rainfall over Northwest India during JFM based on data from 1971 to 2020 is about 184.3 mm. Monthly rainfall over the country as a whole during JFM season is most likely to be below normal. The LPA of rainfall over the country as a whole during the JFM season based on data from 1971-2020 is about 69.7 mm.

The probabilistic forecast for the spatial distribution of tercile rainfall categories (above normal, normal, and below normal) over the country for the JFM period is shown in Fig.1. The forecast suggests that below-normal seasonal rainfall is likely over most parts of Northwest India, many parts of central, east and northeast India. Above-normal to normal rainfall is likely over some parts of south peninsular India and Westcentral India.

2(b). Probabilistic Forecast for the rainfall during January 2023.

The 2023 January rainfall averaged over Northwest India is most likely to be below normal (<78 % of LPA). The LPA of rainfall over Northwest India during January based on the data of 1971-2020 is about 49.0 mm. Monthly rainfall over the country as a whole during January 2023 is most likely to be below normal (<82 % of LPA). The LPA of rainfall over the country as a whole during January based on data from 1971-2020 is about 17.1 mm

The probabilistic forecast for the spatial distribution of tercile rainfall categories (above normal, normal, and below normal) over the country for January 2023 is shown in Fig.2. The forecast suggests that below-normal rainfall is most likely over most parts of the country except many parts of south peninsular India and some pockets of Central India where above normal to normal rainfall is likely. Climatological probabilities are likely over the remaining areas of India. 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 January 2023

Fig.3 and Fig.4 show forecast probabilities of the minimum and maximum temperatures respectively for January 2023. The probability forecast for the minimum temperatures indicates that during January 2023, below-normal minimum temperatures are most likely over many parts of the Central India and adjoining areas of Peninsular, Northwest and East India. Above normal to normal minimum temperatures are most likely over southern parts of South Peninsula many parts of Northeast India and some parts of Northwest India. Climatological probabilities (indicated by white-shaded areas) are predicted over the remaining areas of the country.

The probability forecast for the maximum temperatures (Fig.4) indicates that below-normal maximum temperatures are likely over many parts of central and peninsular India and some parts of East and Northwest India. Above-normal maximum temperatures are likely over most parts of Northeast India and some parts of Northwest, East and Eastcentral India. 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 persist during the JFM season and weaken thereafter.

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.

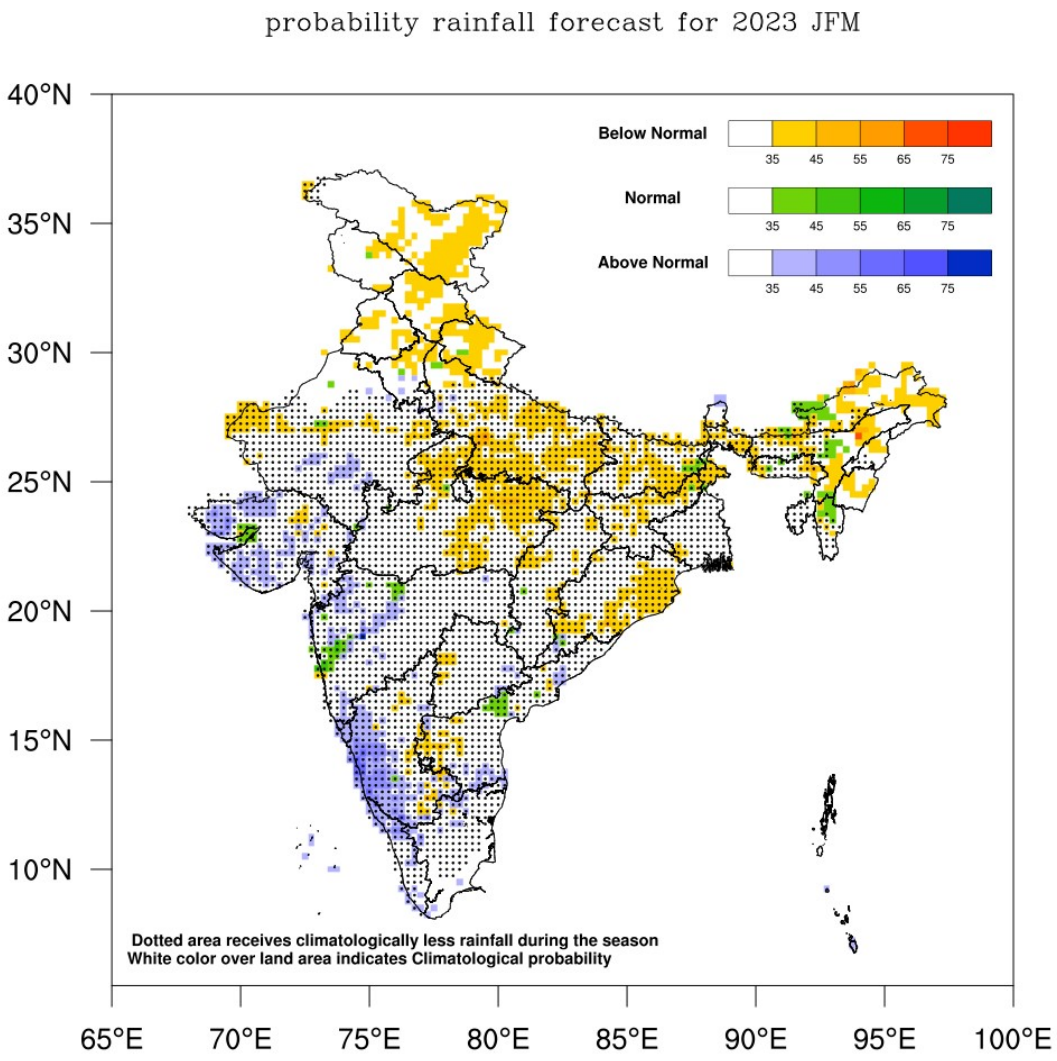

Fig.1. Probability forecast of tercile categories* (below normal, normal, and above normal) for the rainfall over India during JFM 2023. The figure illustrates the most likely categories as well as their probabilities. The dotted area shown in the map climatologically receives very less rainfall during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

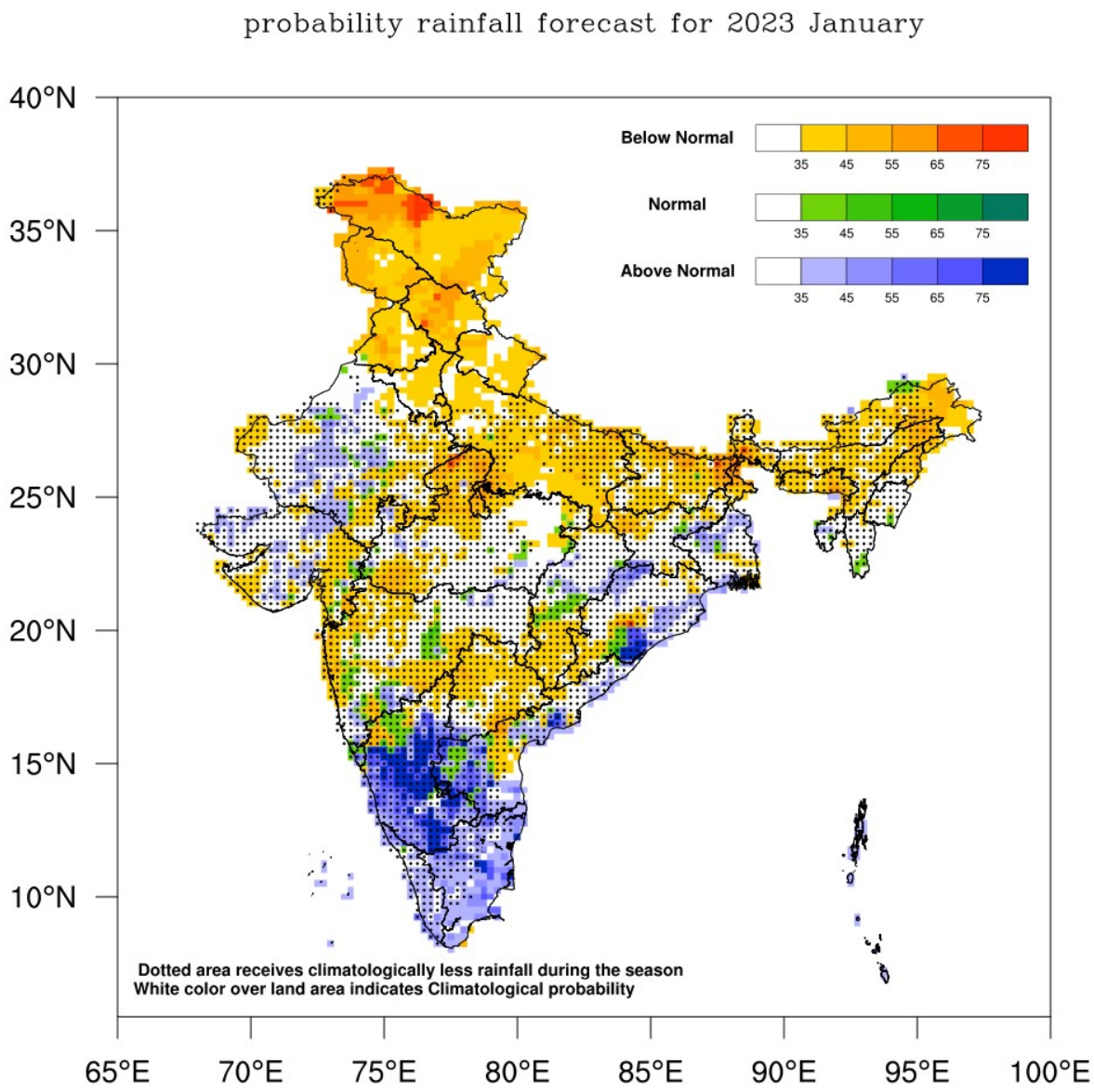

Fig.2. Probability forecast of tercile categories* (below normal, normal, and above normal) for the rainfall over India during January 2023. The figure illustrates the most likely categories as well as their probabilities. The dotted area shown in the map climatologically receives very less rainfall during January and the white-shaded areas within the land areas represent climatological probabilities. (*Tercile categories have equal climatological probabilities, of 33.33% each).

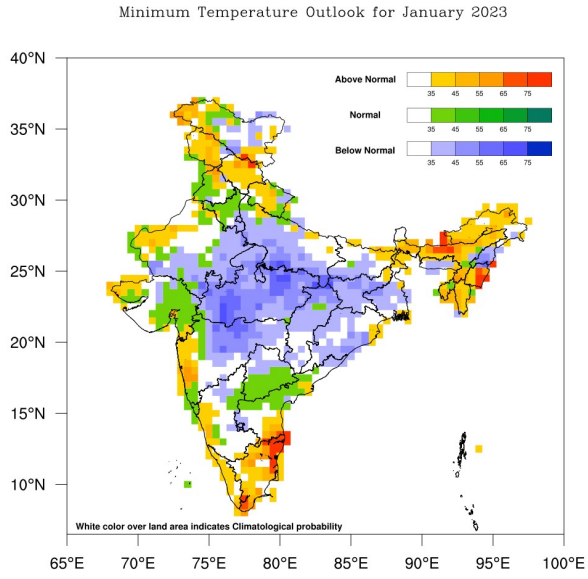

Fig.3. Probability forecast of Minimum Temperature for January 2023.

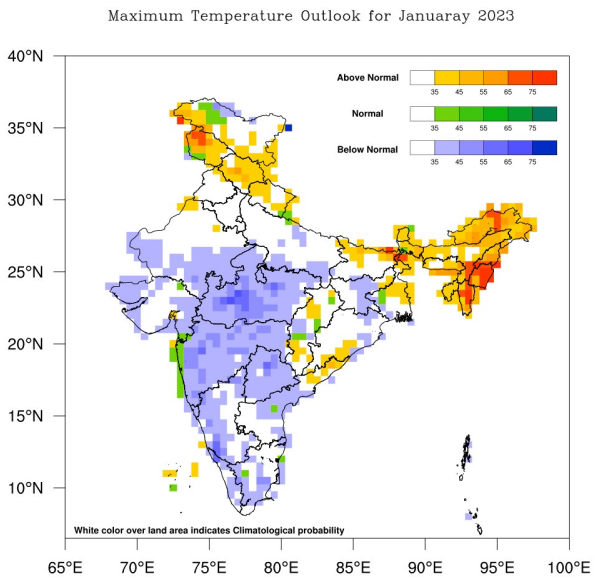

Fig.4. Probability forecast of Maximum Temperature for January 2023.