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INDIA METEOROLOGICAL DEPARTMENT

**Seasonal (March to May) and Monthly (March) 2022 Outlook for the
Temperature and Rainfall**

Highlights

a) Temperature - During the upcoming hot weather season (March to May (MAM)), normal to above normal minimum temperatures are most likely over many parts of northwest India, most parts of northeast India, some parts of central India, east coastal region and some areas along the foothills of the Himalayas. Above normal maximum temperatures are most likely over many areas from west and adjoining areas of central India, northwest India and northernmost parts of northeast India. However, below normal maximum temperatures are likely over most parts of the south peninsula and east and northeast India and northern plains.

During March, normal to below normal minimum temperatures are most likely over most parts of India except some parts of eastern, southeastern & northwestern peninsula. Normal to below normal maximum temperatures are likely over most parts of the south peninsula and east and northeast India whereas above normal maximum temperatures are most likely over many parts of western and central India.

b) Rainfall - The rainfall in March 2022 averaged over the country is most likely to be normal (83-117% of LPA). Below normal rainfall is most likely over most areas of northwest and central India and some parts of northeast India. Normal to above normal rainfall likely over many parts of south Peninsula.

c) SST Conditions - Currently, La Niña conditions are prevailing over the equatorial Pacific region. The La Niña is likely to weaken during the northern hemisphere spring season and to reach cold ENSO neutral conditions during the second quarter of 2022. At present, neutral IOD conditions are present over the Indian Ocean and the latest MMCFS forecast indicates that the neutral IOD conditions are likely to continue during the northern hemisphere spring and summer seasons.

As the changes in the sea surface temperature (SST) conditions over the Pacific and the Indian Oceans are known to influence the Indian climate, IMD is carefully monitoring the evolution of sea surface conditions over these Ocean basins.

Seasonal (March to May) and Monthly (March) 2022 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 subdivision scale temperatures over the country for both hot and cold weather seasons. These predictions were based on the Monsoon Mission Coupled Forecasting System (MMCFS) Model developed under MoES's monsoon mission project. Last year 2021, IMD has adopted a new strategy for issuing monthly and seasonal outlooks of rainfall and temperature over the country. The new 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 MMCFS model. IMD has now prepared seasonal and monthly temperatures forecast outlook over the country for the upcoming hot weather season (March to May 2022) and for March 2022 as presented in section 2(a) and 2(b) respectively.

Utilizing the new strategy of the MME based forecasting system as discussed above, IMD has prepared the following monthly outlook for rainfall for the month of March 2022 as presented in section 3.

2. (a) Seasonal Temperature Forecast for March to May (MAM) 2022

Fig.1a and Fig.1b show forecasted probabilities of the minimum and maximum temperatures respectively for March to May (MAM) 2022 season. The probability forecast for the minimum temperatures (Fig.1a) indicates that during the upcoming hot weather season (March to May (MAM)), normal to above normal minimum temperatures are most likely over many parts of northwest India, most parts of northeast India, some parts of central India, east coastal regions, some areas along the foothills of the Himalayas. Normal to below normal minimum temperatures are most likely over some parts of north interior peninsula and some areas of east, northeast and central India.

The probability forecast for the maximum temperatures (Fig.1b) indicates that below normal maximum temperatures are likely over most parts of the south peninsula and east and northeast India, and northern plains. Above normal maximum temperatures are most likely over many areas from west and adjoining areas of central India, northwest India and northernmost parts of northeast India.

2. (b) Monthly Temperature Forecast for March 2022

Fig.2a and Fig.2b show forecasted probabilities of the minimum and maximum temperatures respectively for March 2022. During March 2022, normal to below normal minimum temperatures are most likely over most parts of India except some parts of eastern, southeastern & northwestern peninsula (Fig.2a).

Normal to below normal maximum temperatures are likely over most parts of the south peninsula and east and northeast India, whereas above normal maximum temperatures are most likely over many parts of western and central India.

3. Monthly Rainfall Forecast for March 2022

The rainfall during March 2022 averaged over the country is most likely to be normal (83-117% of LPA). The LPA of rainfall over the country during March based on data of 1961-2010 is about 30.4 mm.

The probabilistic forecast for the spatial distribution of tercile rainfall categories (above normal, normal and below normal) over the country for the month of March is shown in Fig.3. The forecast suggests that below normal rainfall is most likely over most areas of northwest and central India and some parts of northeast India. The forecast also suggests that normal to above normal rainfall is most likely over many parts of south peninsular India and few parts from east and northeast India. 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.

4. SST conditions in the Pacific and the Indian Oceans

Currently, La Niña conditions are prevailing over the equatorial Pacific region. The La Niña is likely to weaken during the northern hemisphere spring season and to reach cold ENSO neutral conditions during the second quarter of 2022. However, few climate models including MMCFS indicate La Niña conditions likely to continue during the forecast period.

In addition to El Niño- Southern Oscillation (ENSO) conditions over the Pacific, other factors such as the Indian Ocean SSTs also influence on Indian climate. At present, neutral IOD conditions are present over the Indian Ocean and the latest MMCFS forecast indicates that the neutral IOD conditions are likely to continue during the northern hemisphere spring and summer seasons. There is also a possibility of negative IOD conditions during the autumn season.

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 short to medium range forecast issued daily by IMD.

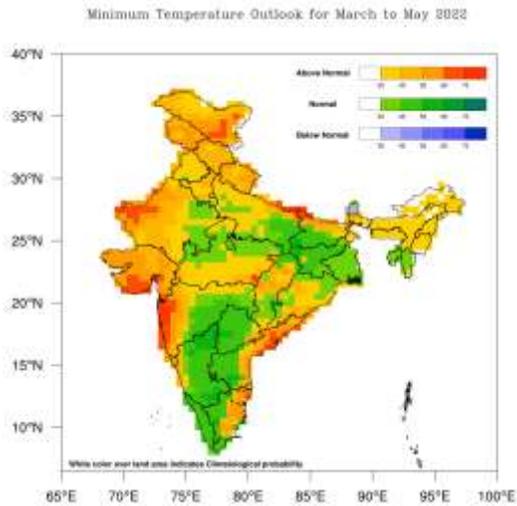


Fig.1a. Probability forecast of Minimum Temperature for March to May 2022.

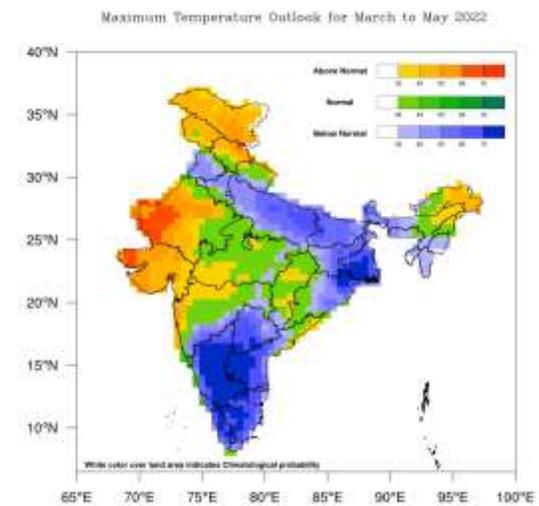


Fig.1b. Probability forecast of Maximum Temperature for March to May 2022.

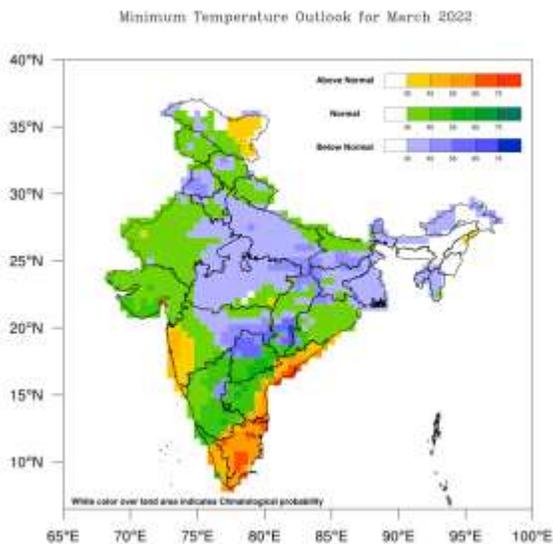


Fig2a. Probability forecast of Minimum Temperature for March 2022.

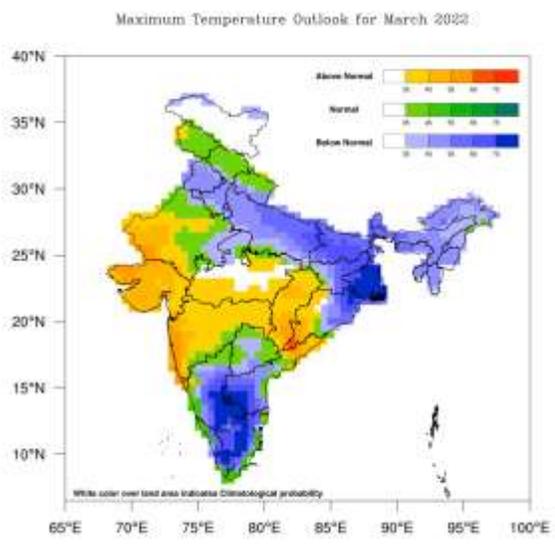


Fig.2b. Probability forecast of Maximum Temperature for March 2022.

probability rainfall forecast for 2022 MAR

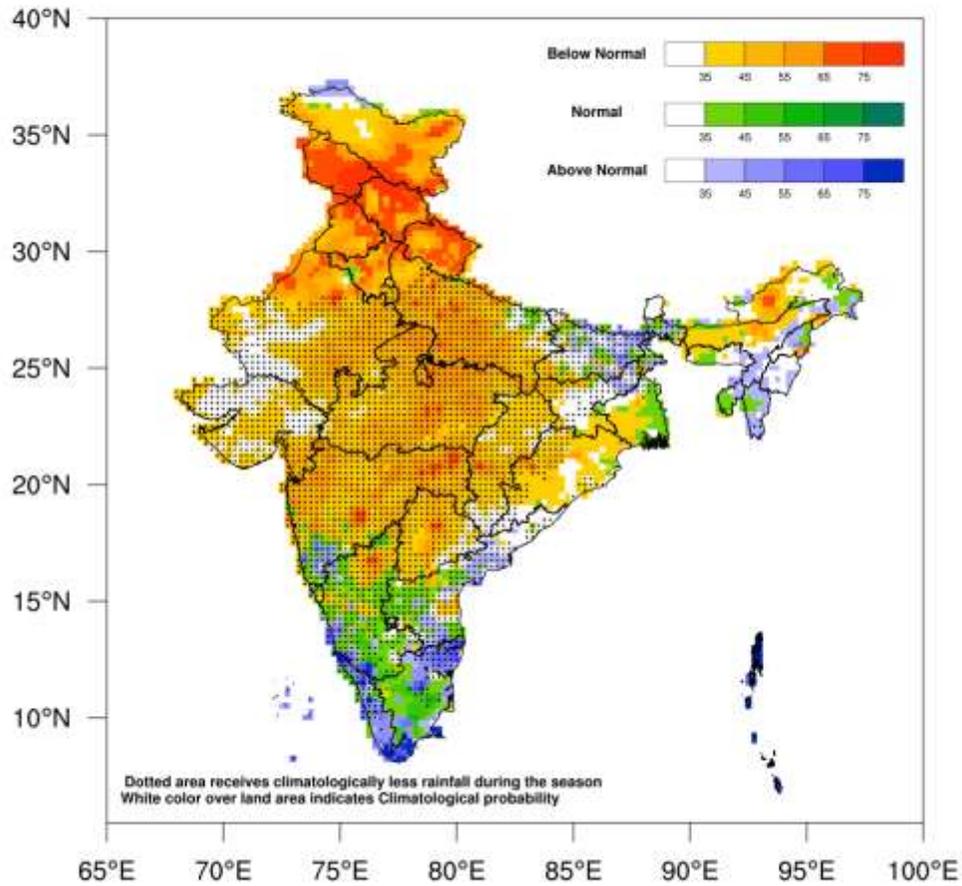


Fig.3. Probability forecast of tercile categories* (below normal, normal and above normal) for the rainfall over India during March 2022. The figure illustrates the most likely categories as well as their probabilities. The dotted area showed in the map climatologically receives very less rainfall and the white shaded areas within the land areas represent climatological probabilities. The probabilities were derived using the MME forecast prepared from a group of coupled climate models. (Tercile categories have equal climatological probabilities, of 33.33% each).