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Ministry of Earth Sciences (MoES)



भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT

Long Range Forecast for the Rainfall during Post-monsoon Season 2024
and Rainfall and Temperature during October 2024

Highlights

- Rainfall averaged over the South Peninsular India consisting of five meteorological subdivisions (Tamil Nadu, Puducherry and Karaikal, Coastal Andhra Pradesh, Rayalaseema, Kerala and Mahe, and South Interior Karnataka) **is most likely to be above normal (>112% of Long Period Average (LPA)) during post-monsoon season (October-December, 2024)**. Normal to Above-normal rainfall is likely over many areas of central India, south peninsular India, and some parts of northeast India during the same period. However, most parts of northwest India, and some parts of northeast India and southernmost parts of India are likely to receive below-normal rainfall.
- During October 2024, most parts of India are likely to receive normal to above normal rainfall in October 2024. However, some parts of northeast and Northwest India and a few pockets in the south peninsula are likely to experience below normal rainfall. Monthly rainfall over the country as a whole during October 2024 **is most likely to be above normal >115 % of LPA**.
- In October, above-normal maximum temperatures are likely over most parts of the country except some parts from central India and adjoining south peninsula where normal to below normal maximum temperatures are likely. During October above-normal minimum temperatures are likely over most parts of the country.
- Currently, neutral El Nino-Southern Oscillation (ENSO) conditions are observed over the equatorial Pacific Ocean with below average sea surface temperatures in the east equatorial Pacific Ocean. The probability forecast indicates a higher chance of development of La Niña conditions during Post-Monsoon season, 2024.
- Above-average sea surface temperatures (SSTs) are currently seen across most of the Indian Ocean. Currently, neutral Indian Ocean Dipole (IOD) conditions prevail over the Indian Ocean. The latest MMCFS forecast indicates that the neutral IOD conditions are likely to continue during post-monsoon season, 2024.

IMD will issue the outlook for the rainfall and temperature for November 2024 towards the end of October 2024.

1. Background

South Peninsular India consisting of five meteorological subdivisions (Tamil Nadu, Puducherry and Karaikal, Coastal Andhra Pradesh, Rayalaseema, Kerala and Mahe, and South Interior Karnataka) receives about 30% of its annual rainfall during the northeast monsoon season (October to December). Tamil Nadu and Puducherry and Karaikal in particular receive about 48% of their annual rainfall during this season. Due to this important fact, IMD has been preparing forecasts for northeast monsoon season rainfall over the south peninsula using statistical models since 1998. IMD also continuously works to improve the skill of the forecasting models.

In the year 2021, IMD adopted a new strategy for issuing monthly and seasonal operational forecasts for the rainfall over the country. The new strategy is based on the existing statistical forecasting system and 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's Monsoon Mission Climate Forecast System (MMCFS) model. Accordingly, IMD issued various seasonal and monthly forecasts over the country for the 2024 southwest monsoon season (June to September).

IMD has prepared the forecast for the rainfall during the post-monsoon season (October to December (OND)), 2024 and the rainfall and temperature forecast for October 2024 as mentioned below.

2. Probabilistic Forecast for the rainfall during October to December (OND) 2024

The rainfall averaged over south Peninsular India during October to December (OND) **season is most likely to be above normal (>112% of Long Period Average (LPA))**. The LPA of rainfall over south Peninsular India during the October to December season based on data from 1971 to 2020 is about 334.13mm.

The spatial distribution of probabilistic forecasts for the tercile categories (above normal, normal, and below normal) of rainfall over the country for the post-monsoon season is shown in Fig.1. The forecast indicates a probability of normal to above-normal rainfall over many areas of the central India, south peninsular India and some parts of northeast India. However, most parts of northwest India and some parts of northeast India and southernmost parts of India are likely to receive below-normal rainfall. The dotted area shown in the map receives very less rainfall during the October to December season as per climatology, and the white shaded areas within the land areas represent climatological probabilities.

3. Probabilistic Forecast for the rainfall during October 2024

The rainfall averaged over the country as a whole during October 2024 **is most likely to be above normal >115 % of LPA**. The LPA of rainfall over the country during the month of October based on data from 1971 to 2020 is about 75.4 mm.

The spatial distribution of probabilistic forecasts for tercile categories (above normal, normal, and below normal) of rainfall over the country during October 2024 is shown in Fig.2. Forecasts suggest that most parts of India are likely to receive normal to above normal rainfall in October 2024. However, some parts of northeast and Northwest

India and a few pockets in the south peninsula are likely to experience below normal rainfall. The white shaded areas within the land area represent climatological probabilities.

4. Probabilistic Forecast of Temperatures over the Country during October 2024

Fig.3a and Fig.3b show probabilistic forecasts of the maximum and minimum temperatures respectively during October 2024.

In October, above-normal maximum temperatures are likely over many parts of the country (Fig. 3a) except some parts of central India and adjoining south peninsula where normal to below normal maximum temperatures are likely.

During October above-normal minimum temperatures are likely over most parts of the country (Fig. 3b).

5. Sea Surface Temperature (SST) conditions in the Pacific and the Indian Oceans

The sea surface temperatures are below average in the eastern equatorial Pacific Ocean. Currently, neutral El Niño-Southern Oscillation (ENSO) conditions are observed over the equatorial Pacific. The probability forecast indicates a higher chance of La Niña conditions developing during the post-monsoon season, 2024.

Above-average sea surface temperatures (SSTs) are currently seen across most of the Indian Ocean. Currently, neutral Indian Ocean Dipole (IOD) conditions prevail over the Indian Ocean. The latest MMCFS forecast indicates that the neutral IOD conditions will continue during post-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 and 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 extended range 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. The forecasts are available through the IMD website https://nwp.imd.gov.in/gfsproducts_cycle00_mausam.php

Probability rainfall forecast for 2024 October to December Season

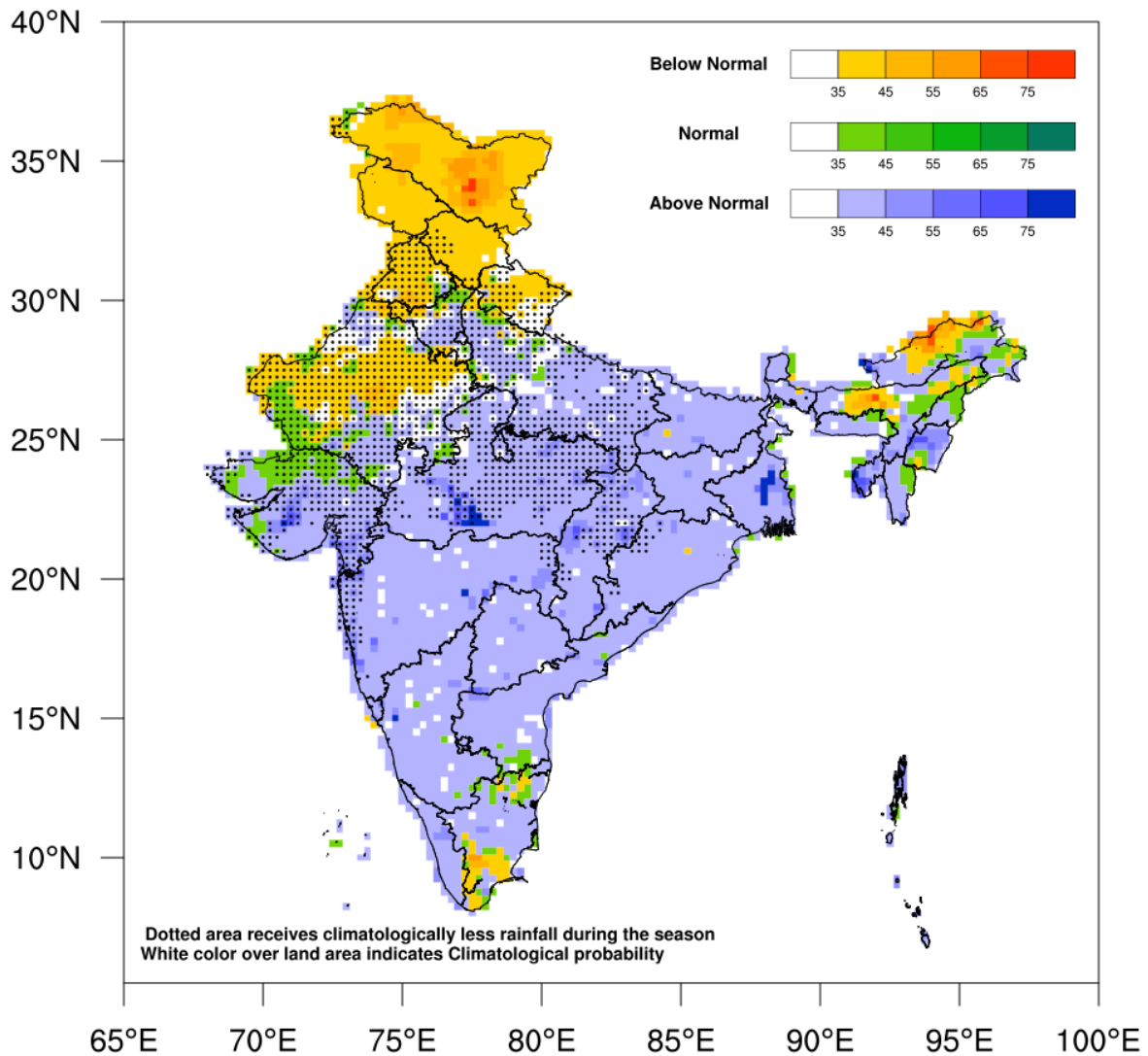


Fig.1. Probability forecast of tercile categories* (below normal, normal, and above normal) of rainfall over India during October to December 2024 period. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area represent climatological probabilities. (*Tercile categories have equal climatological probabilities of 33.33% each). The dotted areas receive low rainfall during the season and generally experience dry weather as per climatology.

probability rainfall forecast for 2024 October

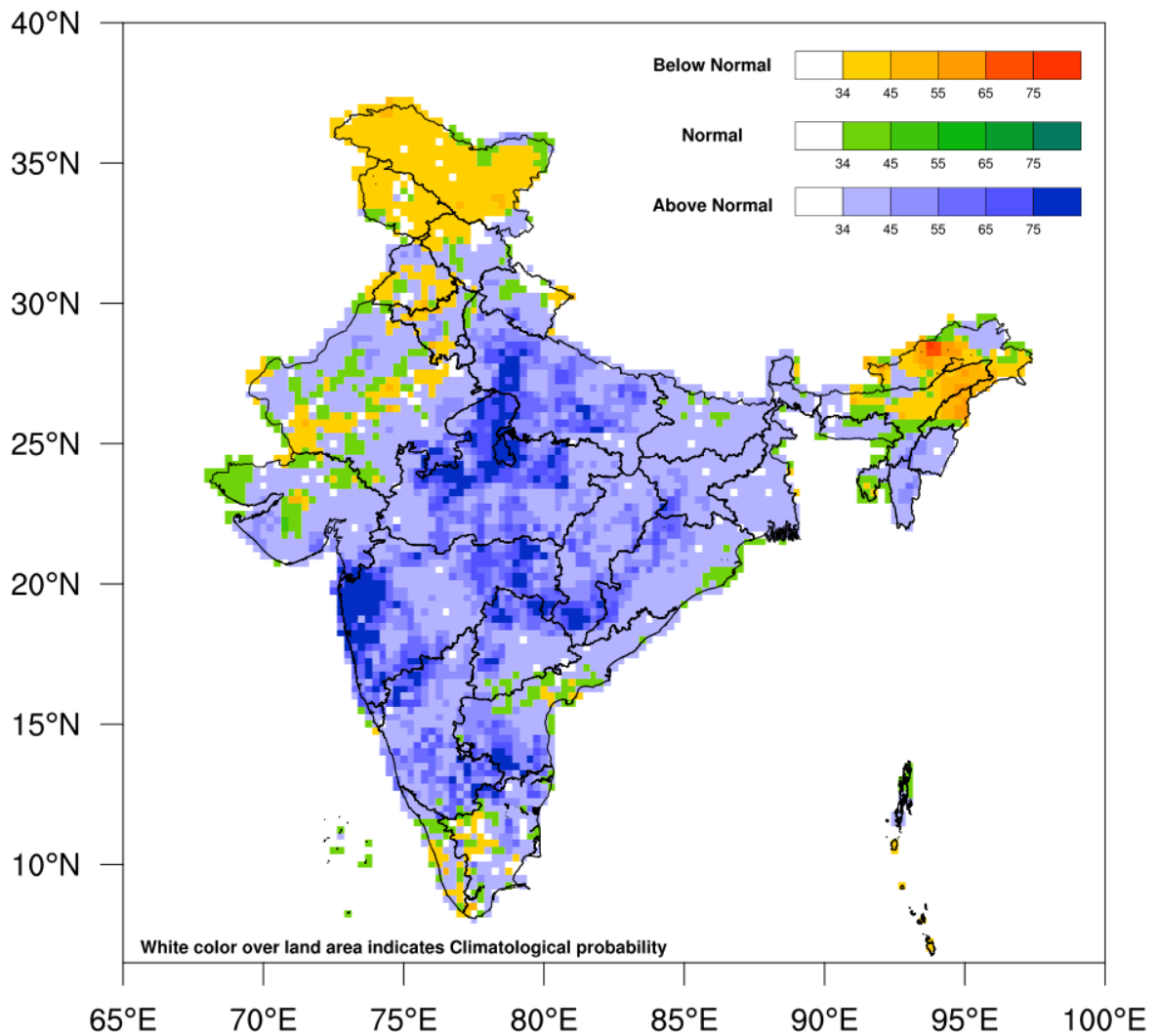


Fig.2. Probability forecast of tercile categories* (below normal, normal, and above normal) of rainfall over India during October 2024. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area represent climatological probabilities (*Tercile categories have equal climatological probabilities of 33.33% each).

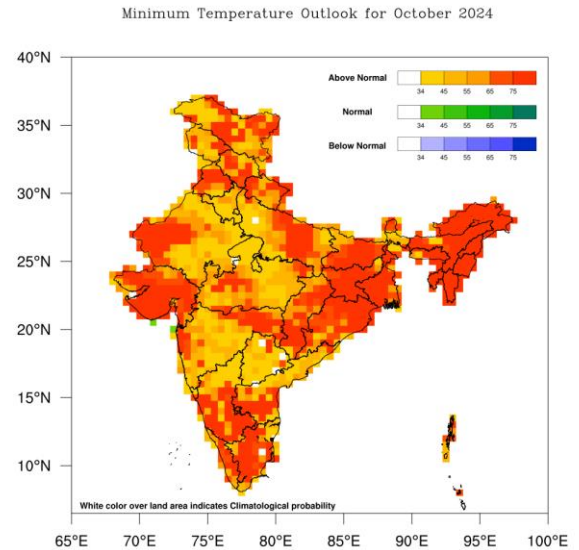
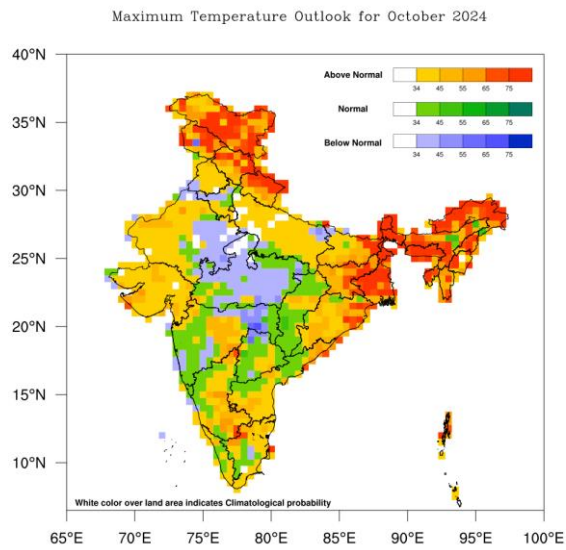


Fig.3a. Probability forecast of Maximum Temperature over India during October 2024.

Fig.3b. Probability forecast of Minimum Temperature over India during October 2024.