



भारत सरकार

Government of India

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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 2022

Highlights

- a) The Northeast Monsoon Season (October to December (OND)) 2022 rainfall over the south Peninsular India consisting of five meteorological subdivisions (Tamil Nadu, Puducherry & Karaikkal , Coastal Andhra Pradesh & Yanam , Rayalaseema, Kerala & Mahe and South Interior Karnataka) is most likely to be normal (88-112% of Long Period Average (LPA)). Normal to above normal rainfall is likely over most parts of India except some regions of Northwest India and some parts of Northeast India where below normal rainfall is likely.
- b) During October 2022, normal to above normal rainfall is likely over most parts of India except small pockets of the southernmost region and northern most part of the country. Monthly rainfall over the country as a whole during October 2022 is most likely to be above normal (>115 % of Long Period Average (LPA)).
- c) During October, normal to below normal maximum temperatures are likely over most parts of the country except many parts of Northeast and Northwest India and some parts of eastern India, where above normal maximum temperatures are likely. Normal to above normal minimum temperatures are likely over most parts of the country except some parts of Northwest India, and southern parts of Peninsular India where below normal minimum temperatures are likely.
- d) Currently, La Niña conditions are prevailing over the equatorial Pacific region. The latest MMCFS forecast indicates that the La Niña conditions are likely to continue up to end of the year. Other climate models are also indicating continuation of La Niña conditions during the upcoming season. At present the negative IOD conditions are prevailing over the Indian Ocean and the latest MMCFS forecast indicates that the negative IOD conditions are likely to weaken by the end of year.

1. Background

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

In the last year 2021, IMD adopted a new strategy for issuing monthly and seasonal operational forecasts for the seasonal 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 had issued various seasonal and monthly forecasts for the 2022 Southwest Monsoon Season (June to September) over the country.

Now, IMD has prepared the forecast for the rainfall during the Post Monsoon Season (October to December (OND)) 2022 and rainfall and temperature forecast for October 2022.

2. Probabilistic Forecast for the rainfall during October to December (OND) 2022

The rainfall averaged over south Peninsular India during October to December (OND) **is most likely to be normal (88-112% 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 334.13 mm.

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 rainfall is shown in Fig.1. It suggests that normal to above normal rainfall probability is likely over most parts of India except some regions of Northwest India and some parts of Northeast India where below normal rainfall is likely. The dotted area shown in the map receives very less rainfall during 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 2022

The rainfall averaged over the country as a whole during October 2022 **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 2022 is shown in Fig.2. It suggests that normal to above normal rainfall is likely over most parts of India except small pockets of the southernmost region and northernmost part of the country. The white shaded areas within the land area represent climatological probabilities.

4. Probabilistic Forecast of Temperatures over the Country during October 2022

Fig.3a and Fig.3b show probabilistic forecast of the maximum and minimum temperatures respectively during October 2022.

During October, normal to below normal maximum temperatures are likely over most parts of the country except many parts of northeast and northwest India and some parts of eastern India, where above normal maximum temperatures are likely (Fig.3a). Normal to above normal minimum temperatures are likely over most parts of the country except some parts of northwest India, and southern parts of Peninsular India where below normal minimum temperatures are likely (Fig. 3b).

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

Currently, La Niña conditions are prevailing over the equatorial Pacific region. The latest MMCFS forecast indicates that the La Niña conditions are likely to continue up to the end of the year. Other climate models are also indicating the continuation of La Niña conditions during the upcoming season.

In addition to El Niño-Southern Oscillation (ENSO) conditions over the Pacific, other factors such as the Indian Ocean SSTs have also some influence on the northeast monsoon. At present, the negative Indian Ocean Dipole (IOD) conditions are prevailing since June 2022 over the Indian Ocean and the latest MMCFS forecast indicates that the negative IOD conditions are likely to weaken by the end of the year.

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 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.

probability rainfall forecast for 2022 OND

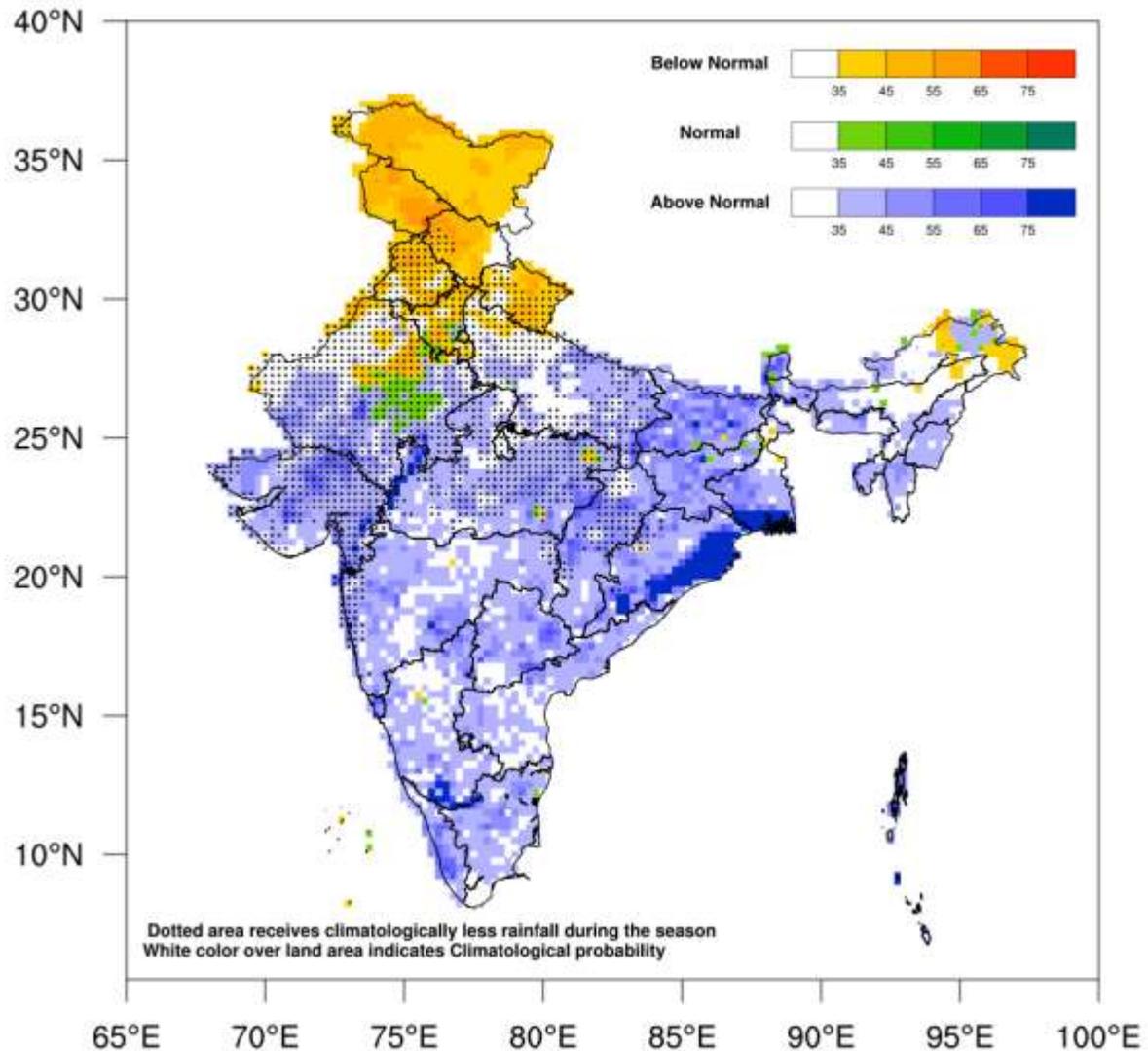


Fig.1. Probability forecast of tercile categories* (below normal, normal, and above normal) of rainfall over India during October to December, 2022 period. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area represent climatological 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 2022 October

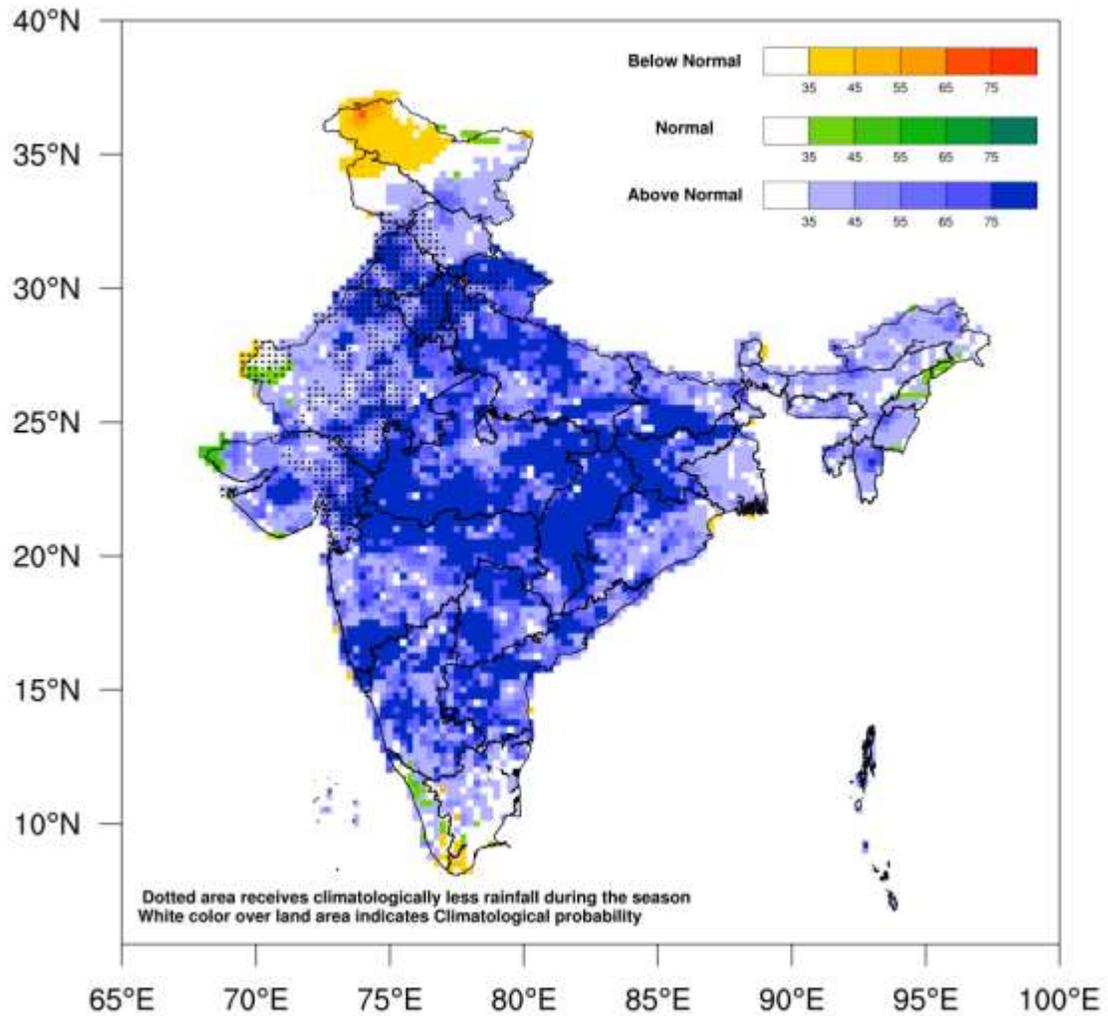


Fig.2. Probability forecast of tercile categories* (below normal, normal, and above normal) of rainfall over India during October, 2022. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area represent climatological probabilities. (*Tercile categories have equal climatological probabilities, of 33.33% each).

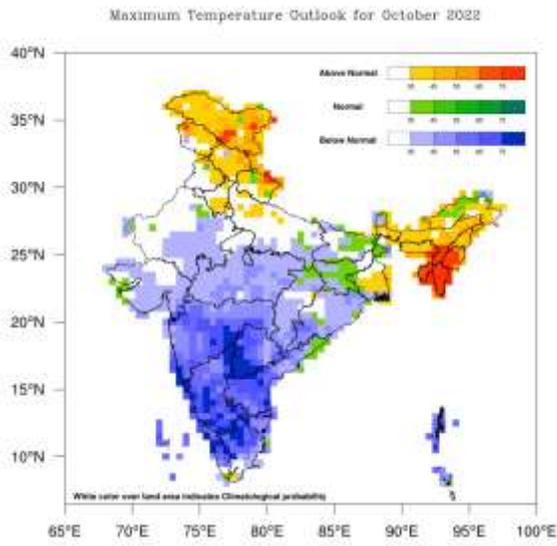


Fig.3a. Probability forecast of Maximum Temperature over India during October 2022.

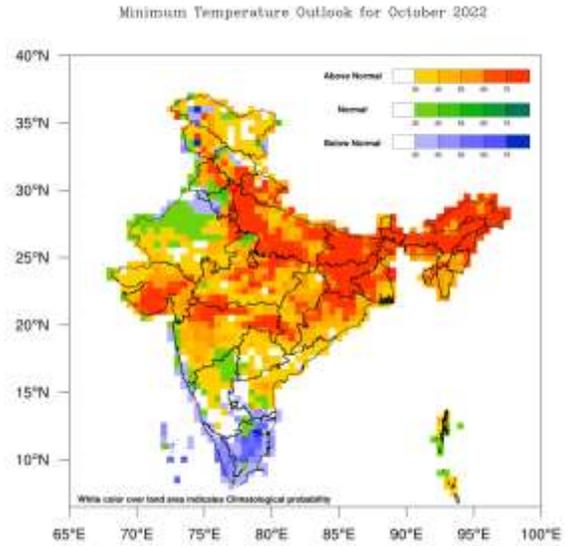


Fig.3b. Probability forecast of Minimum Temperature over India during October 2022.