PRESS RELEASE
New Delhi, 14th April, 2022

भारत सरकार
Government of India
पृथ्वी विज्ञान मंत्रालय (एम. ओ. ई. एस.)
Ministry of Earth Sciences (MoES)
भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT

Long Range Forecast for the 2022 Southwest Monsoon Season Rainfall

Summary of the Forecast for the 2022 Southwest Monsoon Rainfall

a) Southwest monsoon seasonal (June to September) rainfall over the country as a whole is most likely to be **normal (96 to 104 % of Long Period Average (LPA)).**

b) Quantitatively, the monsoon seasonal (June to September) rainfall is likely to be **99%of the Long Period Average (LPA) with a model error of ± 5%.** The LPA of the season rainfall over the country as a whole for the period **1971-2020 is 87 cm**.

c) Currently, La Niña conditions are prevailing over the equatorial Pacific region. The latest MMCFS as well as other climate model forecast indicates that La Niña conditions are likely to continue during the monsoon season.

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 until the beginning of southwest monsoon season. Thereafter, enhanced probability for negative IOD condition is predicted.

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

IMD will issue the **updated forecasts for monsoon season rainfall in the last week of May 2022.** In addition to update for the April forecast, forecasts for monsoon season (June-September) rainfall for four geographical regions, monsoon core zone and forecast for the month of June also will be issued.

1. Background

Since 2003, India Meteorological Department (IMD) has been issuing the operational long-range forecast (LRF) for the southwest monsoon season (June-September) rainfall averaged over the country as a whole in two stages. The first stage forecast is issued in April and the second stage or update forecast is issued by the end of May. Last year, IMD has implemented a new strategy for issuing monthly and seasonal operational forecasts for the southwest monsoon rainfall over the country by modifying the existing two stage forecasting strategy. The new strategy uses a newly developed Multi-Model Ensemble (MME) forecasting system based on coupled global climate models (CGCMs) from different global climate prediction and research centers including IMD's Monsoon Mission Climate Forecast System (MMCFS) along with the existing statistical forecasting system to generate these forecasts.

2. Forecast for the 2022 Southwest monsoon Season (June–September) rainfall over the country as a whole

2 a. Forecast Based on the Operational Statistical Ensemble Forecasting System (SEFS)

The forecast based on SEFS suggests that quantitatively, the monsoon seasonal rainfall is likely to be **99% of the Long Period Average (LPA) with a model error of ± 5%.** The LPA of the season rainfall over the country as a whole for the period **1971-2020 is 87 cm**.

The five category probability forecasts for the Seasonal (June to September) rainfall over the country as a whole based on the SEFS forecast are given below, which suggests the highest probability for monsoon seasonal rainfall to be normal (96-104% of LPA).

Category	Rainfall Range (% of LPA)	Forecast Probability (%)	Climatological Probability (%)
Deficient	< 90	14	16
Below Normal	90 - 96	26	17
Normal	96 -104	40	33
Above Normal	104 -110	15	16
Excess	> 110	05	17

2b. Forecast based on the Multi Model Ensemble (MME) Forecasting System

For generating the MME forecast for 2022 southwest Monsoon season rainfall, April initial conditions have been used. Best models among the climate models with the highest skill over the Indian monsoon region have been used to generate multi-model forecasts. MMCFS is one of the four models used for calculating MME forecast.

The MME forecast also suggests that the monsoon rainfall during the 2022 monsoon season (June to September) averaged over the country as a whole is likely to be **normal (96-104% of LPA).** The LPA of the June to September period rainfall over the country as a whole for the period 1971-2020 is 87cm.

The spatial distribution of probabilistic forecasts for tercile categories (above normal, normal and below normal) for the seasonal rainfall (June to September) is shown in Fig.1. The spatial distribution suggests normal to above normal seasonal rainfall is most likely over many areas of northern parts of Peninsular India and adjoining Central India, over foothills of the Himalayas and some parts of Northwest India. Below normal rainfall is likely over many areas of Northeast India, some areas of Northwest India and southern parts of the South Peninsula. The white shaded areas within the land area represent climatological probabilities.

3. Sea Surface Temperature (SST) Conditions in the equatorial Pacific & Indian Oceans

Currently, La Niña conditions are prevailing over the equatorial Pacific region. The latest MMCFS as well as other climate model forecast indicates that La Niña conditions are likely to continue during the monsoon season.

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 until the beginning of the southwest monsoon season. Thereafter, enhanced probability for negative IOD condition is predicted.

As sea surface temperature (SST) conditions over the Pacific and the Indian Oceans are known to have a strong influence on the Indian monsoon, IMD is carefully monitoring the evolution of sea surface conditions over these Ocean basins.

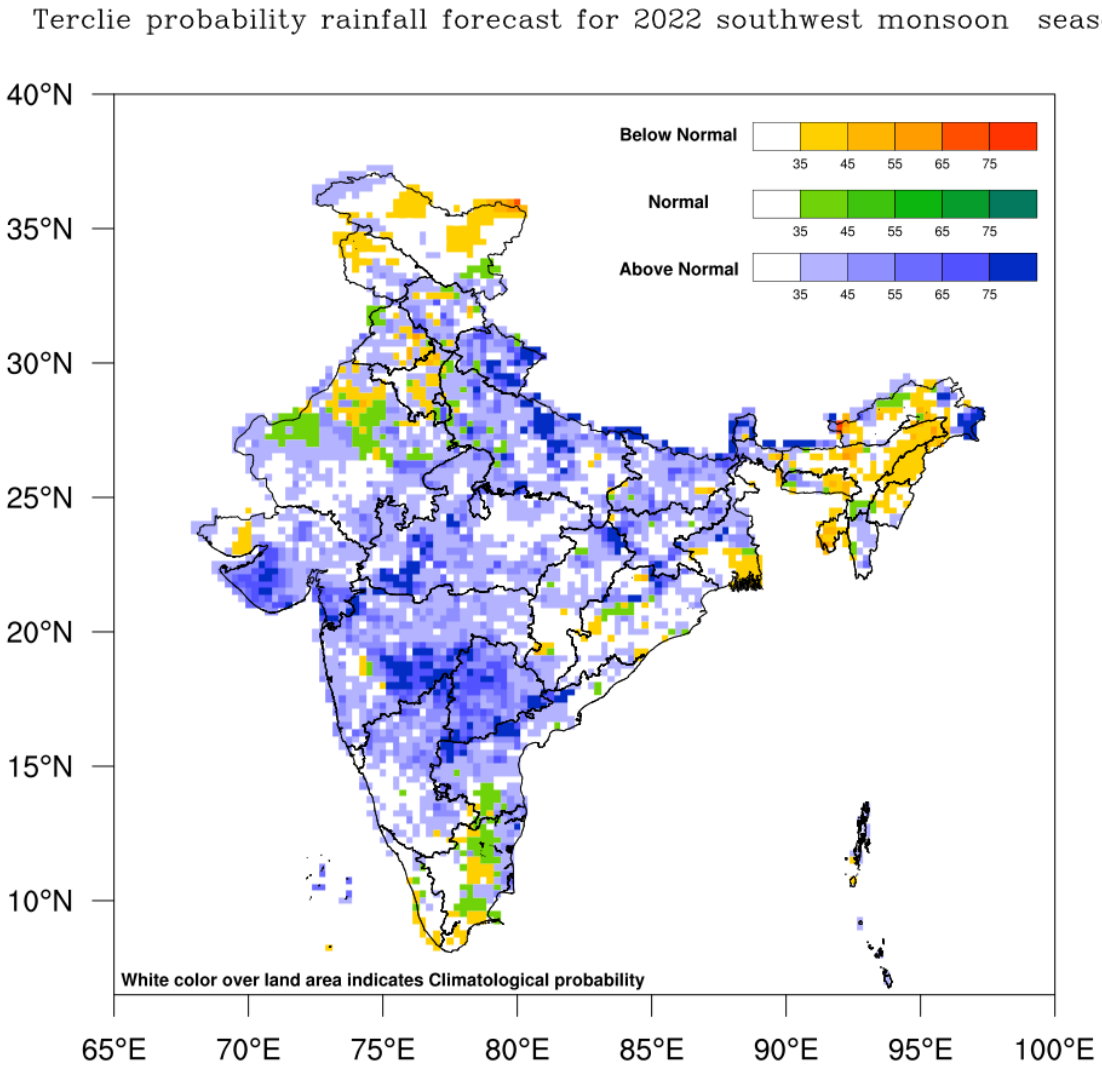

Fig.1. Probability forecast of tercile categories* (below normal, normal, and above normal) for the seasonal rainfall over India during the 2022 southwest monsoon season (June -September). The figure illustrates the most likely categories as well as their probabilities. The white shaded areas represent climatological probabilities for all the tercile categories. The probabilities were derived using the MME forecast prepared from a group of four best coupled climate models.(* Tercile categories have equal climatological probabilities, of 33.33% each).