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

**Southwest monsoon rainfall Forecast for the second half of the season and for the month of August 2021.**

**Highlights**

- a) Rainfall over the country as a whole during the second half (August to September period) of the 2021 southwest monsoon season is most likely to be **normal (95 to 105 % of Long Period Average (LPA)) with a tendency to be in the positive side of the normal.**
- b) Monthly rainfall for the 2021 August over the country as a whole is most likely to be **normal (94 to 106 % of Long Period Average (LPA)).**
- c) The latest global model forecasts indicate that the prevailing neutral ENSO conditions are likely to continue over the equatorial Pacific Ocean. However, sea surface temperatures over central and east equatorial Pacific Ocean is showing cooling tendency and there is an increased possibility of re-emergence of the La Nina condition in the end of the monsoon season or thereafter. Prevailing negative IOD conditions over the Indian Ocean are likely to continue during remaining part of the monsoon season.

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

IMD will issue the **forecast for September month rainfall towards end of August or beginning of September 2021.**

## 1. Background

This year, IMD has adopted 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 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 the first stage forecast for the 2021 southwest monsoon seasonal (June to September) rainfall over the country on 16<sup>th</sup> April and the first update for the forecast on 1<sup>st</sup> June 2021. IMD had also issued the monthly forecast outlook for June rainfall over country along with the update forecast on 1<sup>st</sup> June and that for the July rainfall on 1<sup>st</sup> July 2021.

Now, IMD has prepared the forecast outlook for the rainfall during the second half (August to September (AS)) of the 2021 southwest monsoon season and that for the August 2021.

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

Currently, the SSTs and the atmospheric conditions over the equatorial Pacific Ocean indicate neutral ENSO conditions. However, the SSTs over central and east equatorial Pacific Ocean is showing cooling tendency. The latest forecasts from MMCFS and other global models suggests that ENSO neutral conditions are likely to continue during the remaining part of the monsoon season and increased possibility of re-emergence of the La Nina conditions in the end of the monsoon season or thereafter.

In addition to ENSO conditions over the Pacific, other factors such as the Indian Ocean SSTs also influence on Indian monsoon. Currently, the negative Indian Ocean Dipole (IOD) conditions are prevailing over the equatorial Indian Ocean. The latest forecasts from MMCFS and other global models indicate that negative IOD conditions are likely to continue during the remaining part of the monsoon season.

## 3. Probabilistic Forecast for the 2021 August to September (Aug+Sep) Rainfall over the Country

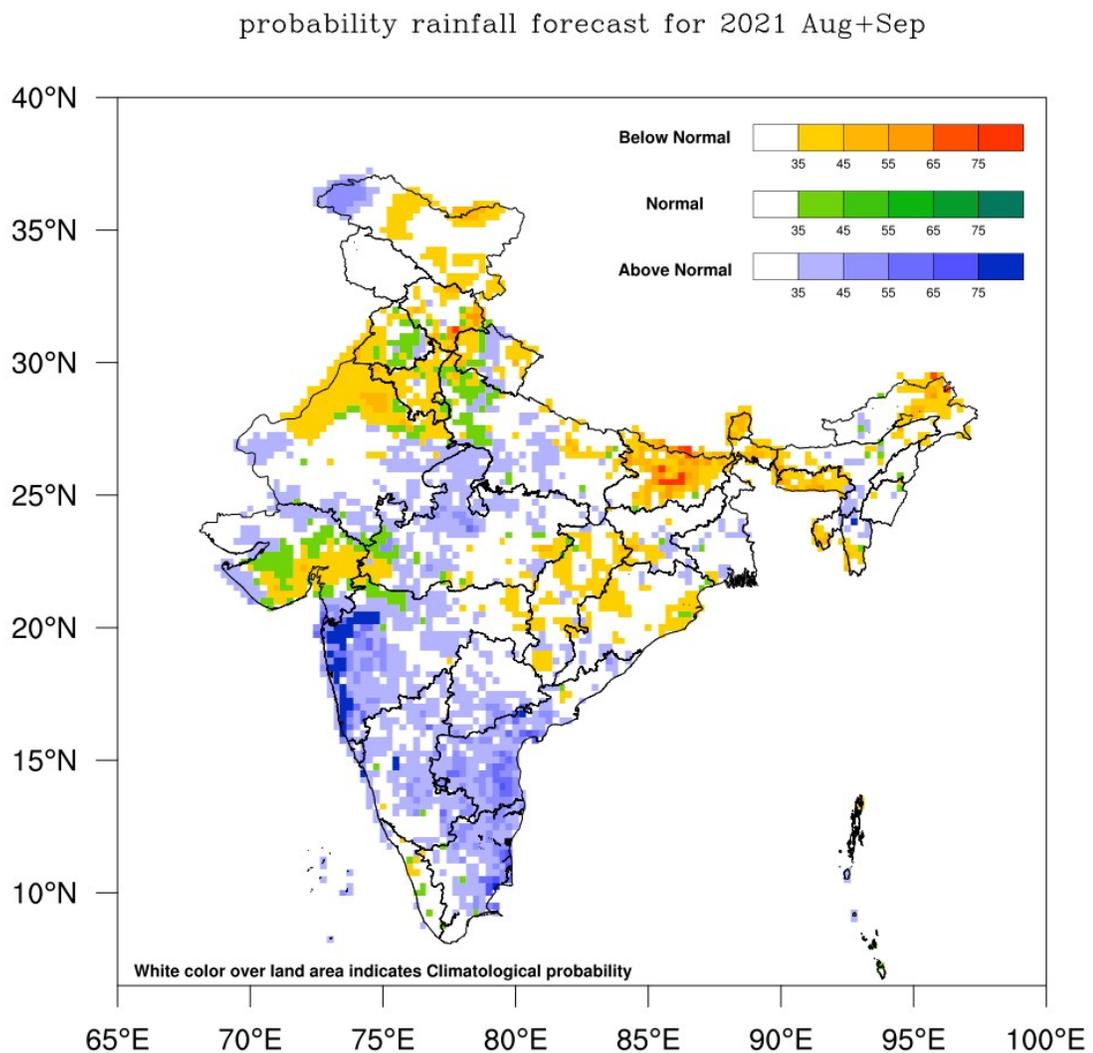
The 2021 August to September rainfall averaged over the country as a **whole is most likely to be normal (95 to 105 % of LPA) with a tendency to be in the positive side of the normal**. The LPA of the August to September period rainfall over the country as a whole for the period 1961-2010 is 428.3 mm,

The spatial distribution of probabilistic forecasts for the tercile categories (above normal, normal and below normal) for the August to September rainfall is shown in Fig.1. The spatial distribution suggests that below normal to normal rainfall is likely over many parts of the northwest, east and northeast parts of the country. Normal to above normal rainfall is most likely to experience over most parts of peninsular India and adjacent central India. The white shaded areas within the land region represent climatological probabilities.

#### 4. Probabilistic Forecast for the 2021 August Rainfall over the Country

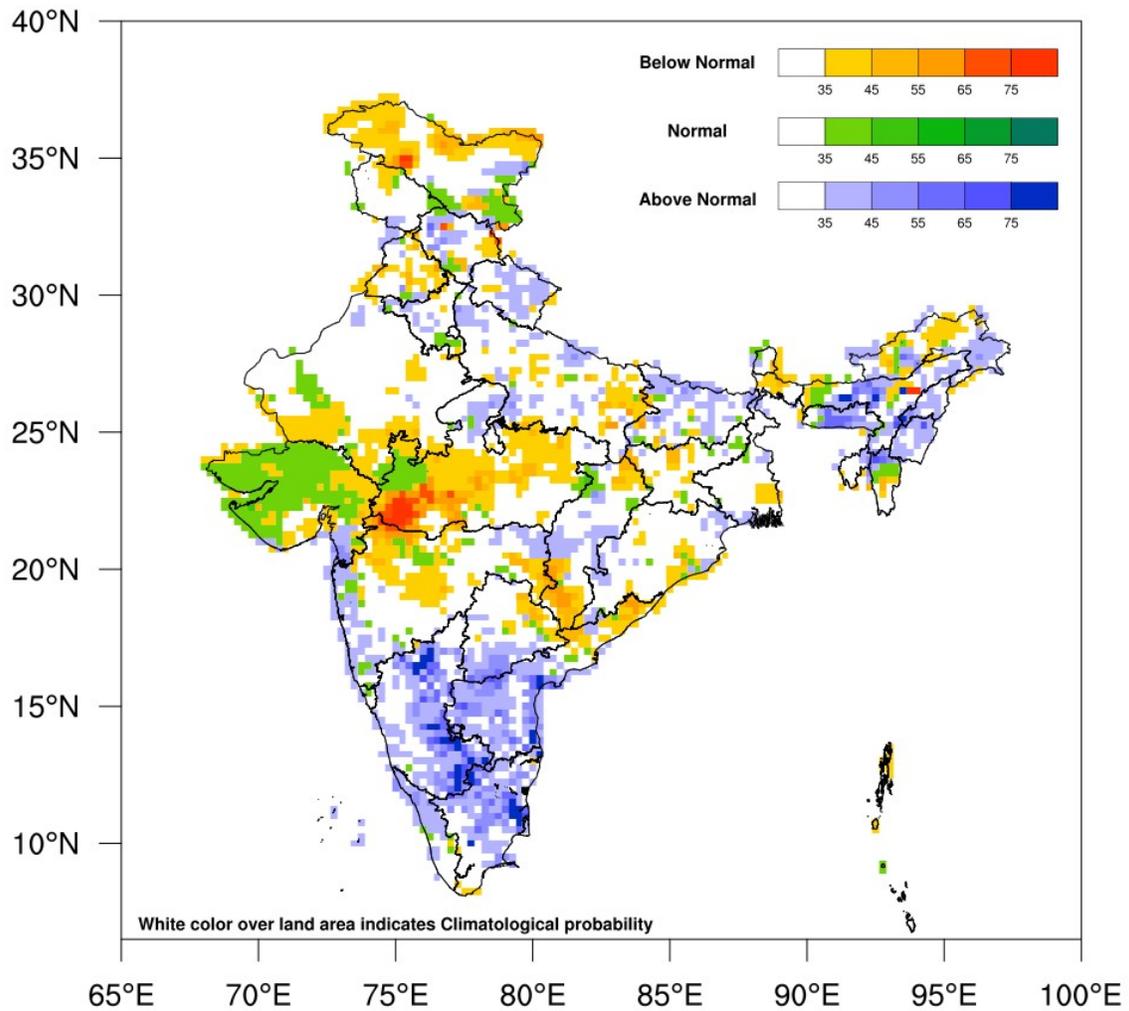
The 2021 August rainfall averaged over the country as a **whole is most likely to be normal (94 to 106 % of LPA)**. The LPA of the August rainfall over the country as a whole for the period 1961-2010 is 258.1 mm

The spatial distribution of probabilistic forecasts for tercile categories (above normal, normal and below normal) for the August rainfall is shown in Fig.2. The spatial distribution suggests that below normal to normal rainfall is likely over many areas of central India and some areas over northwest India. Normal to above normal rainfall is most likely over most parts of peninsular India and northeast India. The white shaded areas within the land region represent climatological probabilities.



**Fig.1.** Probability forecast of tercile categories\* (below normal, normal and above normal) of rainfall for the second half (August to September) of the 2021 southwest monsoon season over India. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area 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).

probability rainfall forecast for 2021 AUG



**Fig.2.** Probability forecast of tercile categories\* (below normal, normal and above normal) for the 2021 August rainfall over India. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area 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).