



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

Forecast Outlook for the Monthly Rainfall and Temperature for
September 2023

Highlights

- a) **Rainfall** - Monthly rainfall for September 2023 over the country as a whole is most likely to be normal (91-109 % of Long Period Average (LPA)). Normal to above normal rainfall is most likely over many areas of northeast India, adjoining east India, foothills of Himalayas and some areas of east-central and south peninsular India. Below normal rainfall is most likely over most areas of the remaining parts of the country.
- b) **Temperature** - Above normal maximum temperatures are likely over most parts of the country, except over some areas in south peninsular India and some pockets of west central India, where normal to below normal maximum temperatures are likely. Above normal minimum temperatures are likely over most parts of the country, except for some areas in extreme north India, where normal to below normal minimum temperatures are likely
- c) **SST** -Currently, weak El Niño conditions are prevailing over the equatorial Pacific region. The latest forecast of MMCFS and other global models indicate that the El Niño conditions are likely to intensity further and continue up to early next year. At present, border line positive IOD conditions are prevailing over the Indian Ocean and the latest forecast of MMCFS and other global models indicate that the positive IOD conditions are likely to strengthen during the upcoming months.

IMD will issue the forecast for the rainfall during the Post-Monsoon (Oct-Dec (OND) season, 2023 and for the rainfall and temperature during October, 2023 towards the end of September 2023.

1. Background

Since 2021, IMD has been issuing monthly and seasonal operational forecasts for the southwest monsoon rainfall over the country based on the Multi-Model Ensemble (MME) 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 Forecasting System (MMCFS) model.

Accordingly, IMD had issued the first stage forecast for the 2023 southwest monsoon seasonal (June to September) rainfall over the country on 11th April 2023 and update for the forecast on 26th May 2023. Subsequently, IMD had issued the monthly outlook for rainfall and temperatures for July 2023 on 30th June 2023. IMD has also issued Southwest monsoon rainfall Forecast for the second half of the season and for the month of August 2023 on 31st July 2023. The forecast for the rainfall and temperature for September, 2023 is given below.

2. Probabilistic Forecast of Rainfall over the Country during September 2023

The rainfall averaged over the country as a whole during September 2023 **is likely to be normal (91-109 % of LPA)**. The LPA of rainfall over the country during the month of September based on data of 1971-2020 is about 167.9 mm.

The spatial distribution of probabilistic forecasts for tercile categories (above normal, normal and below normal) for September rainfall is shown in Fig.1. The forecast suggests that above normal rainfall is most likely over many areas of the northeast India, adjoining east India, foothills of Himalayas and some areas of east-central and south peninsular India. However, normal to below normal rainfall probability is most likely over most areas of the remaining part of the country.. The white shaded areas within the land area represent climatological probabilities.

3. Probabilistic Forecast of Temperatures over the Country during Sept. 2023

Fig.2a and Fig.2b show forecast probabilities of the maximum and minimum temperatures respectively during September 2023.

In September, above normal maximum temperatures are likely over most parts of the country, except for some areas in south peninsular India and some pockets of west central India, where normal to below normal maximum temperatures are likely (Fig.2a). Above normal minimum temperatures are likely over most parts of the country, except for some areas in extreme north India, where normal to below normal minimum temperatures are likely (Fig. 2b).

4. Sea surface temperature (SST) conditions in the Pacific and the Indian Oceans

Currently, weak El Niño conditions are prevailing over the equatorial Pacific region. The latest forecast of MMCFS and other global model forecasts indicate that the El Niño conditions are likely to further intensity and continue up to early next year.

In addition to ENSO conditions over Pacific, other factors such as the Indian Ocean Sea Surface Temperatures (SSTs) also have some influence on Indian monsoon. At present the border line positive IOD conditions are prevailing over the Indian Ocean and the latest MMCFS and other global model forecast indicate positive IOD conditions are likely to strengthen during the upcoming months.

5. 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 2023 September

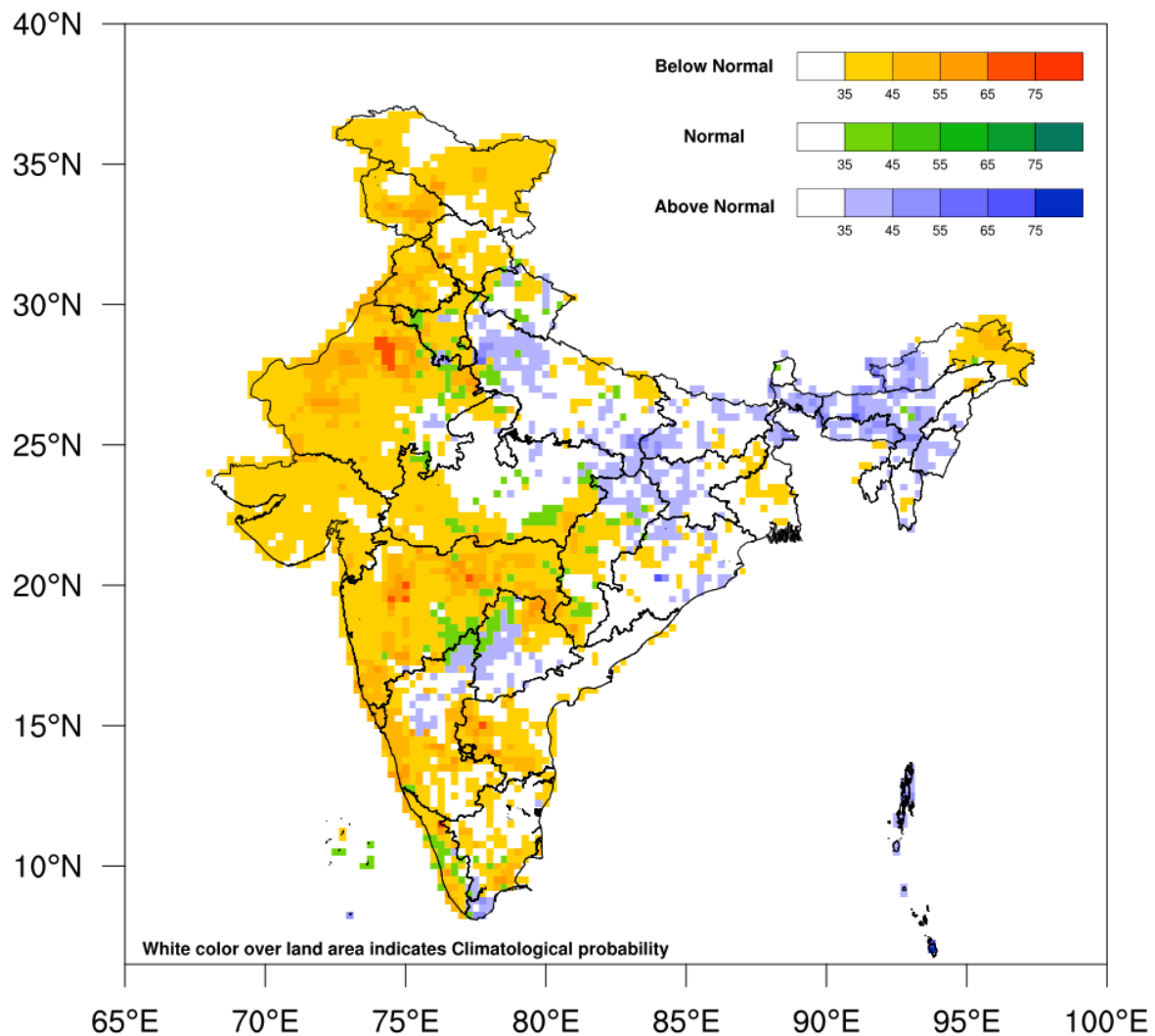


Fig.1. Probability forecast of tercile categories* (below normal, normal and above normal) for the rainfall over India during September 2023. The figure illustrates the most likely categories as well as their probabilities. The white shaded areas within the land area represent climatological probabilities. *Tercile categories have equal climatological probabilities of 33.33% each.

Maximum Temperature Outlook for September 2023

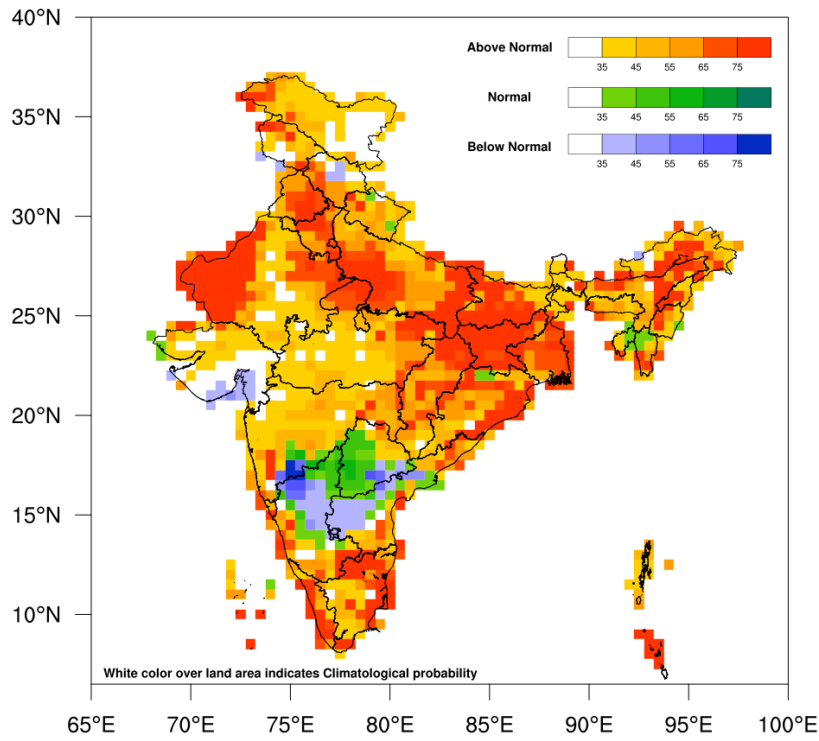


Fig.2a. Probability forecast of Maximum Temperature during September 2023.

Minimum Temperature Outlook for September 2023

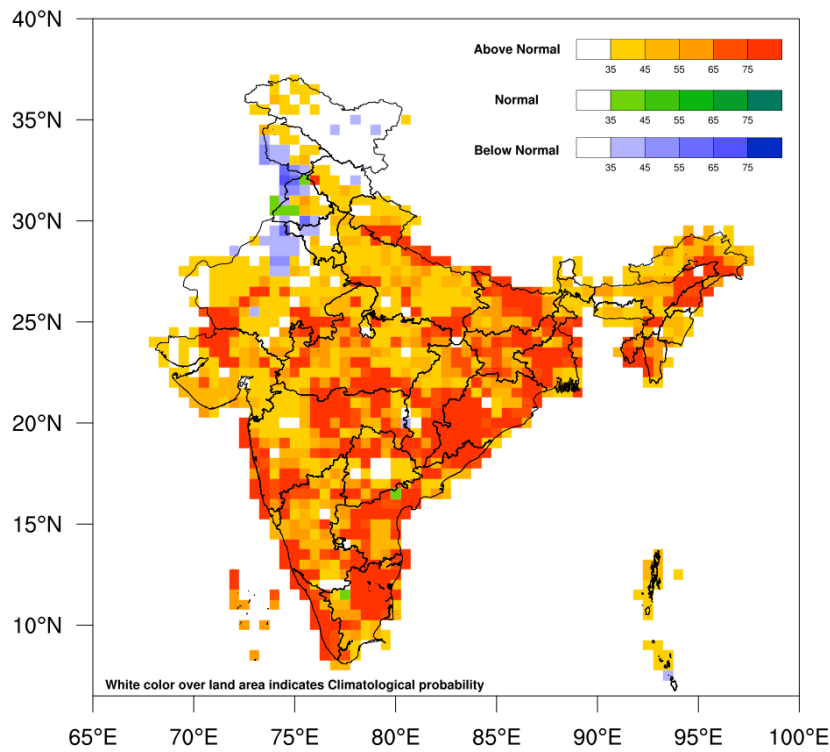


Fig.2b. Probability forecast of Minimum Temperature during September 2023.