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**Government of India**  
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**Ministry of Earth Sciences (MoES)**  
**भारत मौसम विज्ञान विभाग**  
**INDIA METEOROLOGICAL DEPARTMENT**

**Updated Seasonal outlook for Hot weather Season (April to June) 2023 and  
Monthly Outlook for April 2023 for the Rainfall and Temperature**

**Highlights**

- During the 2023 hot weather season (April to June (AMJ)), most parts of the country is expected to experience above normal maximum temperatures, except for South Peninsular India and some parts of Northwest India where normal to below normal maximum temperatures are likely.
- During the season (AMJ), normal to above normal minimum temperatures are very likely over most parts of the country, except for some areas in Northeast and Northwest India as well as some isolated pockets in Peninsular India where below normal minimum temperatures are likely.
- For the month of April 2023, normal to above normal maximum temperatures are likely over most parts of the country, except for some areas in Peninsular, Northeast, and Northwest India where below normal maximum temperatures are likely.
- Most parts of the country are likely to experience normal to below normal monthly minimum temperatures during April 2023, except for some areas in Northwest, Central and East India where above normal minimum temperatures are expected.
- Above normal heatwave days are likely to occur over most parts of Central India, East India and Northwest India during the hot weather season, April to June 2023.
- Above normal heatwave days are likely over many parts of Bihar, Jharkhand, East Uttar Pradesh, Odisha, Gangetic West Bengal, north Chhattisgarh, western part of Maharashtra, Gujarat and some parts of West Uttar Pradesh, Punjab and Haryana during April 2023.
- The rainfall during April 2023 averaged over the country as a whole is most likely to be normal (88-112% of LPA). Normal to above normal rainfall is expected over most parts of the Northwest, Central and Peninsular India whereas below normal rainfall is likely over East and Northeast India and some areas over the west coast of India.

# Updated Seasonal outlook for Hot weather season (April to June) 2023 and Monthly Outlook for April 2023 for the Rainfall and Temperature

## 1. Background

The India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) has been issuing seasonal outlooks for hot and cold weather seasons since 2016, providing temperature forecasts for the country. IMD is continuously working to improve its forecasting models and currently uses the Multi-Model Ensemble (MME) approach, which utilizes Coupled Global Climate Models (CGCMs) from various global climate prediction and research centers, including the IMD/MoES Monsoon Mission Climate Forecast System (MMCFS) model.

IMD has prepared updated seasonal and monthly temperature forecasts for the 2023 hot weather season; for April to June 2023 and for April 2023 respectively. These forecasts are presented in sections 2(a) and 2(b).

Section 3 presents the heatwave outlook for the hot weather season (April to June 2023) and for the month of April 2023. A heatwave is a period of abnormally high temperatures, exceeding the normal maximum temperature for the hot weather season. In Section 4, IMD has provided the monthly rainfall outlook for April 2023

## 2. (a) Seasonal Temperature outlook for April to June (AMJ) 2023

Fig.1a and Fig.1b show forecasted probabilities of the maximum and minimum temperatures respectively for the 2023 hot weather season from April to June.

Based on the forecast, it is expected that, most parts of the country are expected to experience above normal maximum temperatures during the hot weather season, with the exception of South Peninsular India and some parts of Northwest India where normal to below normal maximum temperatures are likely (Fig. 1a). Climatological probabilities for maximum temperatures are most probable in certain areas of Northwest India and some isolated pockets of Peninsular India (Fig. 1a).

The probability forecast for the minimum temperatures (Fig.1b) indicates that during the hot weather season (AMJ), normal to above normal minimum temperatures are very likely over most parts of the country with the exception of some areas in Northeast and Northwest India, as well as some isolated pockets in Peninsular India where below normal minimum temperatures are likely.

## 2. (b) Monthly Temperature Forecast for April 2023

Fig.2a and Fig.2b display the forecast probabilities of maximum and minimum temperatures respectively, for the month of April 2023. During April 2023, above normal maximum temperatures are likely over most parts of the country, except for parts of

Peninsular India and some parts of westcentral India where either below normal maximum temperatures or climatological probabilities are likely (Fig.2a).

Normal to below normal monthly minimum temperatures are most likely over most parts of India, except some areas in Northwest and Central India where above normal minimum temperatures are likely (Fig.2b). Additionally, climatological probabilities for minimum temperatures are likely in certain areas of Northeast India, North India and Central India.

### **3. Heatwave outlook for the Season April to June and for April 2023**

The anomaly forecast for the number of heatwave days over the country for the hot weather season April to June 2023 is shown in Fig 3a. Above normal heatwave days are likely to occur over most parts of Central India, East India and Northwest India during the hot weather season.

The anomaly forecast for the number of heatwave days over the country for April 2023 is shown in Fig 3b. Above normal heatwave days are likely over many parts of Bihar, Jharkhand, East Uttar Pradesh, Odisha, Gangetic West Bengal, north Chhattisgarh, western part of Maharashtra, Gujarat and some parts of West Uttar Pradesh, Punjab and Haryana during April 2023.

### **4. Monthly Rainfall outlook for April 2023**

The rainfall during April 2023 averaged over the country as a whole is most likely to be normal (88-112% of LPA). The LPA of rainfall over the country during April based on data from 1971 to 2020 is about 39.2 mm.

The probabilistic forecast for the spatial distribution of tercile rainfall categories (above normal, normal, and below normal) across the country for April 2023 is shown in Fig.4. The forecast suggests that normal to above normal rainfall is expected over most parts of the Northwest, Central and Peninsular India whereas below normal rainfall is likely over East and Northeast India and some areas over the west coast of India. The dotted areas on the map typically receive very little rainfall during April and the white shaded areas within the land areas represent climatological probabilities.

### **5. Sea surface Temperature (SST) conditions in the Pacific and the Indian Oceans**

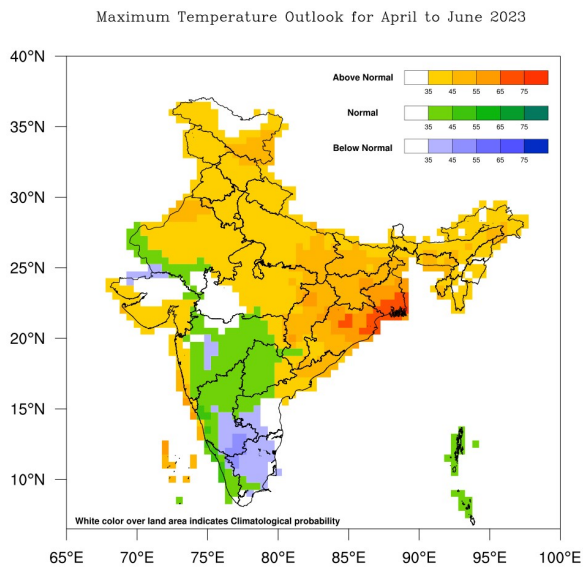
Currently, neutral ENSO conditions are prevailing over the equatorial Pacific region. The forecast suggest that equatorial central Pacific Ocean is expected to have near normal SSTs with some warm anomalies in the upcoming season.

In addition to ENSO conditions over the Pacific, other factors such as the Indian Ocean SST also influence the Indian climate. At present, neutral Indian Ocean Dipole (IOD) conditions are present over the Indian Ocean and the latest MMCFS forecast indicates that the neutral IOD conditions are likely to continue during the hot weather season.

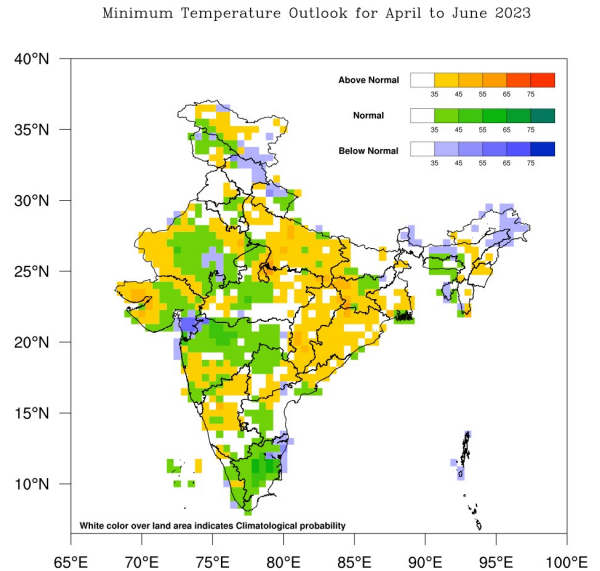
## 6. Extended Range Forecast and short to medium-range forecasting services

IMD also provides extended range forecasts (7 day averaged forecasts for the next four weeks) of rainfall and maximum & 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](https://mausam.imd.gov.in/imd_latest/contents/extendedrangeforecast.php)).

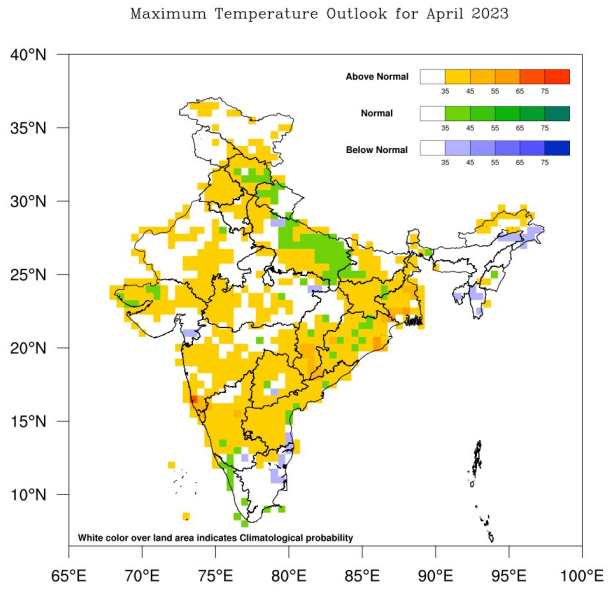
The extended range forecast is followed by short to medium range forecasts issued daily by IMD.



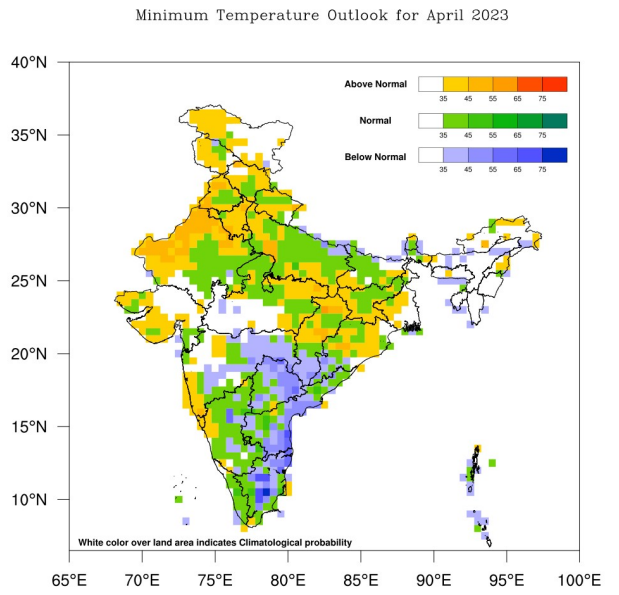
**Fig.1a.** Probability forecast of Maximum Temperature for April to June 2023.



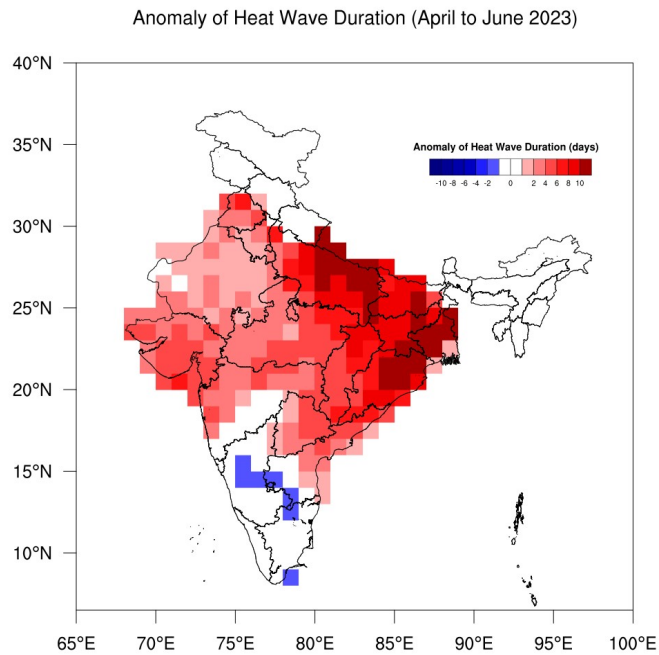
**Fig.1b.** Probability forecast of Minimum Temperature for April to June 2023.



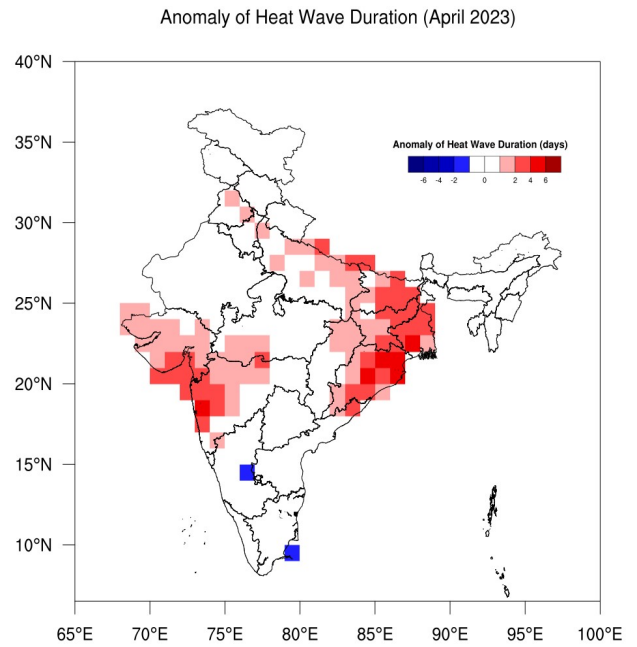
**Fig.2a.** Probability forecast of Maximum Temperature for April 2023.



**Fig2b.** Probability forecast of Minimum Temperature for April 2023.

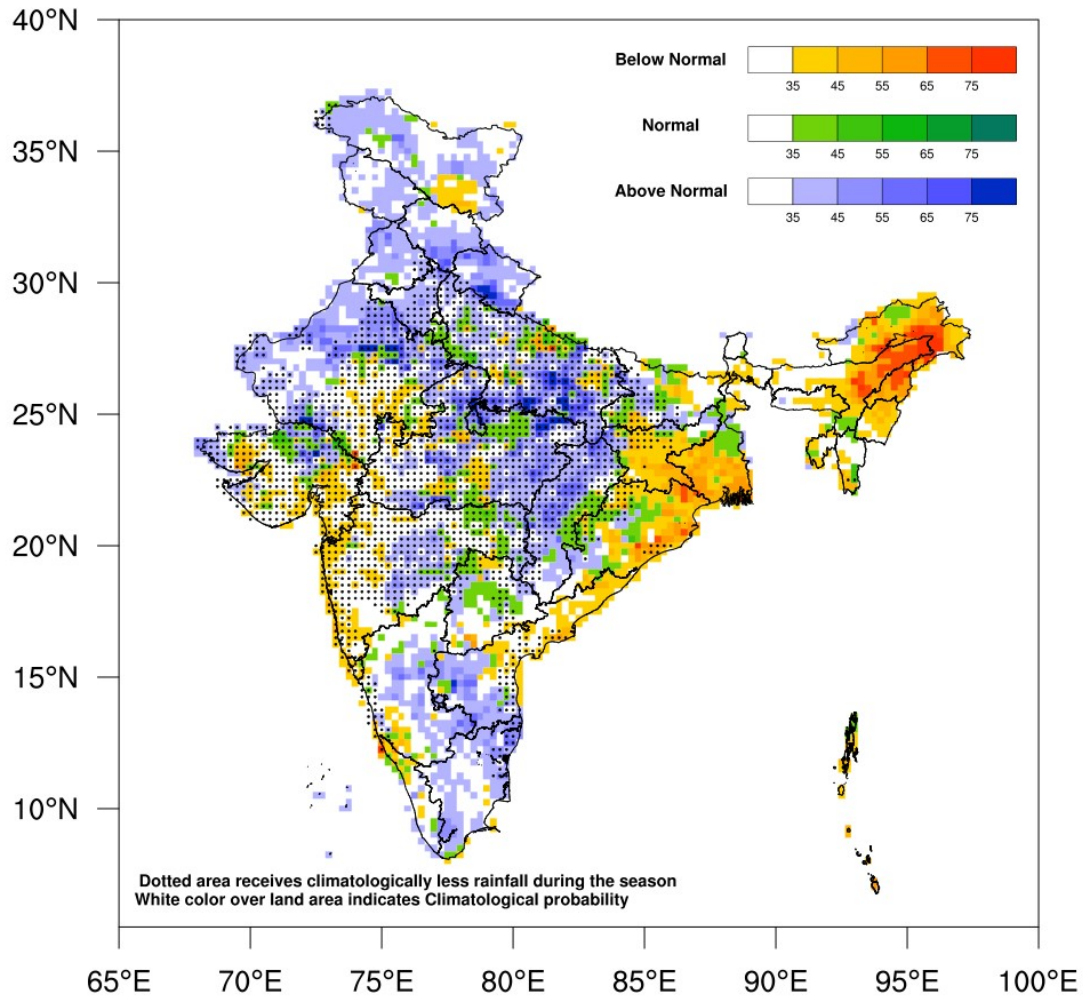


**Fig3a.** Anomaly of Heat Wave Duration (in days) for the season April to June (AMJ) 2023.



**Fig3b.** Anomaly of Heat Wave Duration (in days) for April 2023.

## probability rainfall forecast for 2023 APR



**Fig.4.** Probability forecast of tercile categories\* (below normal, normal, and above normal) for the rainfall over India during April 2023. The figure illustrates the most likely categories as well as their probabilities. The dotted area shown in the map climatologically receives very less rainfall and the white-shaded areas within the land areas represent climatological probabilities. (\*Tercile categories have equal climatological probabilities, of 33.33% each).