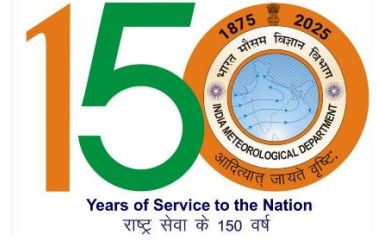




भारत सरकार
Government of India
पृथ्वी विज्ञान मंत्रालय
(एम. ओ. ई. एस.)
Ministry of Earth Sciences
(MoES)



भारत मौसम विज्ञान विभाग

INDIA METEOROLOGICAL DEPARTMENT

**Updated Seasonal outlook for hot weather season (April to June) 2024 and
 Monthly Outlook for April 2024 for the Rainfall and Temperature**

Highlights

- During the 2024 hot weather season (April to June (AMJ)), above-normal maximum temperatures are likely over most parts of the country, except some parts of east and northeast India and pockets of northwest India where normal to below-normal maximum temperatures are likely.
- During the season (AMJ), normal to above normal minimum temperatures are likely over most parts of the country except of some isolated areas in northeast and northwest India, where normal to below normal minimum temperatures are likely.
- For the month of April 2024, above-normal maximum temperatures are likely over most parts of the country. However, isolated pockets of east, northeast and northwest India are likely to experience normal to below-normal maximum temperatures.
- Above normal monthly minimum temperatures are most likely over most parts of India, except one or two pockets of northwest and northeast India where normal to below-normal minimum temperatures are likely during April 2024.
- During AMJ hot weather season, above normal heatwave days are likely to occur over most parts of south peninsula, central India, east India and plains of northwest India.
- During April 2024, above normal heatwave days are likely over many parts of south peninsula and adjoining northwest central India and some parts of east India and plains of northwest India.
- The rainfall during April 2024, averaged over the country as a whole, is most likely to be normal (88-112% of LPA). Normal to above-normal rainfall is likely over most parts of the northwest India and many parts of central India, north peninsular India, some parts of east and north east India. Below normal rainfall is likely along east and west coasts, some parts of east and northeast India and west central India.

Updated Seasonal outlook for hot weather season (April to June) 2024 and Monthly Outlook for April 2024 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 2024 hot weather season (April to June) and April 2024, 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 2024) and for the month of April 2024. 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 2024.

2. (a) Seasonal Temperature outlook for April to June (AMJ) 2024

Probability forecasts for the maximum and minimum temperatures during April to June (AMJ) 2024 hot weather season are shown in Fig.1a and Fig.1b respectively. Probability forecast for maximum temperatures over India (Fig.1a) suggests that, above-normal maximum temperatures are likely during the hot weather season over most parts of the country, except some parts from east and northeast India and pockets of northwest India where normal to below-normal maximum temperatures are likely. Climatological probabilities are likely over southernmost parts of northeast India and many pockets from north and central India (Fig. 1a). The white shaded area within the land shows climatological probability over the region.

The probability forecast for the minimum temperatures (Fig.1b) indicates that during the hot weather season (AMJ), normal to above normal minimum temperatures are likely over most parts of the country except some isolated areas in northeast and northwest India, where normal to below normal minimum temperatures are likely. Climatological probabilities are likely over isolated pockets across India (Fig.1b).

2. (b) Monthly Temperature Forecast for April 2024

Probability forecasts for the maximum and minimum temperatures during April 2024 is shown in Fig.2a and Fig.2b respectively. During April 2024, above-normal maximum temperatures are likely over most parts of the country. However, isolated pockets from east and northeast India and northwest India are likely to experience normal to below-normal maximum temperatures (Fig.2a).

Above normal monthly minimum temperatures are most likely over most parts of India, except one or two pockets from northwest and northeast India where normal to below-normal minimum temperatures are likely (Fig.2b).

3. Heatwave outlook for the Season April to June (AMJ) and for April 2024

The anomaly (deviation from normal) forecast for the number of heatwave days over the country for the season April to June 2024 is shown in Fig 3a. During AMJ hot weather season, above normal heatwave days are likely to occur over most parts of south peninsula, central India, east India and plains of northwest India.

The anomaly forecast for the number of heatwave days over the country for April 2024 is shown in Fig 3b. During April 2024, above normal heatwave days are likely over many parts of south peninsula and adjoining northwest central India and some parts of east India and plains of northwest India.

During heatwaves, elevated temperatures pose significant risks, especially for vulnerable populations like the elderly, children, and those with pre-existing health conditions, who are more susceptible to heat-related illnesses such as heat exhaustion and heatstroke. Additionally, prolonged periods of extreme heat can lead to dehydration, and strain infrastructure such as power grids and transportation systems. To address these challenges, it is imperative for authorities to take proactive measures. This includes providing access to cooling centers, issuing heat advisories, and implementing strategies to alleviate urban heat island effects in affected areas. Such efforts are essential for safeguarding public health and minimizing the adverse impacts of heatwaves.

4. Monthly Rainfall Outlook for April 2024

The rainfall during April 2024 averaged over the country as a whole is most likely to be normal (88-112% of Long Period Average {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) over the country for April 2024 is shown in Fig.4. The forecast suggests that Normal to above-normal rainfall is likely over most parts of the northwest India and many parts of central India, north peninsular India, some parts of east and north east India. Below normal rainfall is likely along east and west coasts, some parts of east and northeast India and west central India. The dotted area shown in the map climatologically receives very less rainfall during April, and the white-shaded areas within the land represent climatological probabilities.

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

Strength of El Niño conditions weakened since beginning of the year and currently moderate El Niño conditions are prevailing over equatorial Pacific. The sea surface temperatures (SSTs) are warmer than normal over most of the equatorial Pacific Ocean. The latest MMCFS forecast indicates that strength of El Niño condition is likely to weaken during the upcoming season and turn to neutral thereafter. Models also indicate the development of La Niña conditions during the monsoon season.

At present, neutral Indian Ocean Dipole (IOD) conditions are prevailing over the Indian Ocean and the latest MMCFS forecast indicates development of positive IOD conditions during the monsoon 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 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.

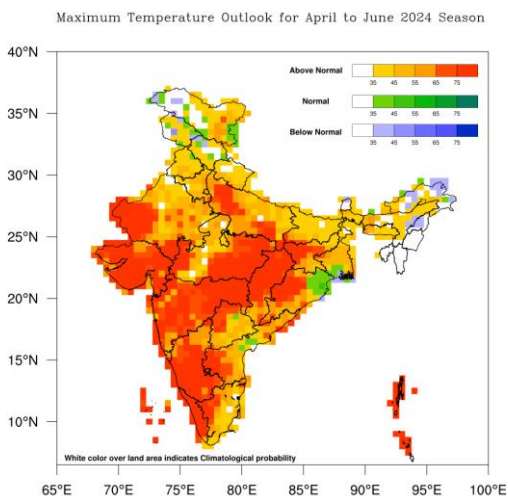


Fig.1a. Probability forecast of Maximum Temperature for April to June 2024.

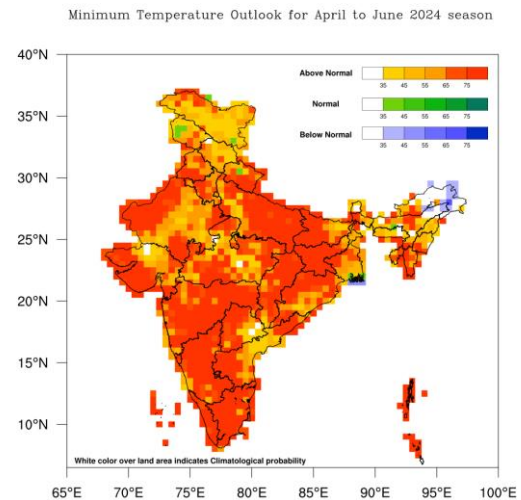


Fig.1b. Probability forecast of Minimum Temperature for April to June 2024.

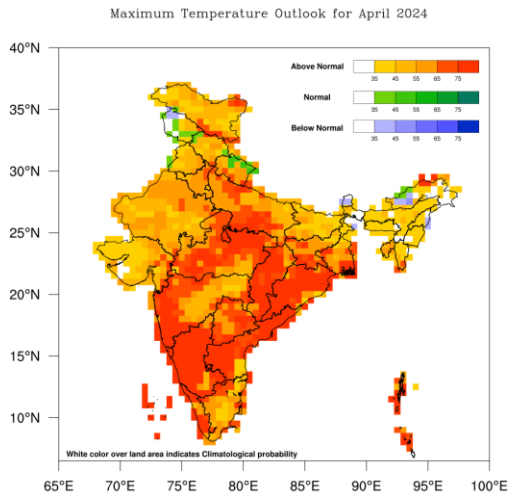


Fig.2a. Probability forecast of Maximum Temperature for April 2024.

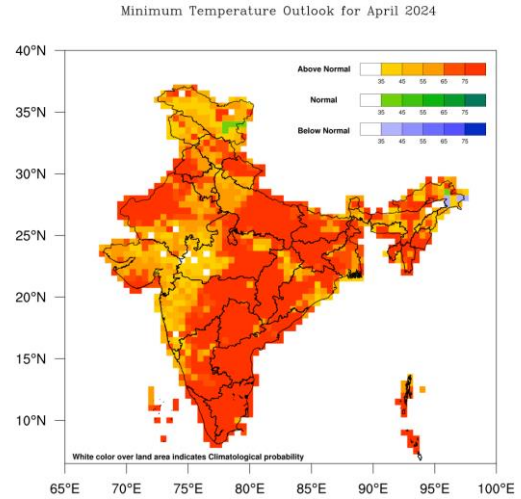


Fig2b. Probability forecast of Minimum Temperature for April 2024.

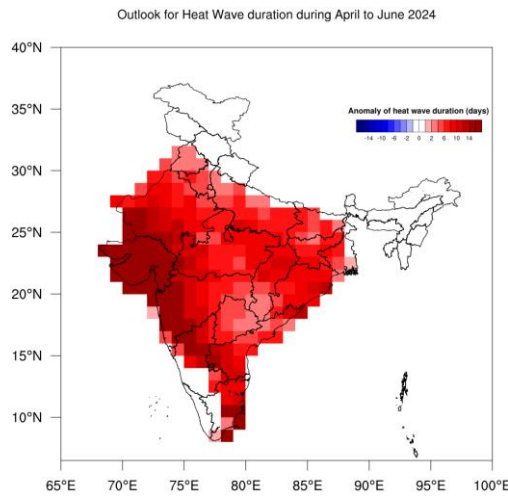


Fig3a. Anomlay of Heat Wave Duration (in days) for the season April to June (AMJ) 2024.

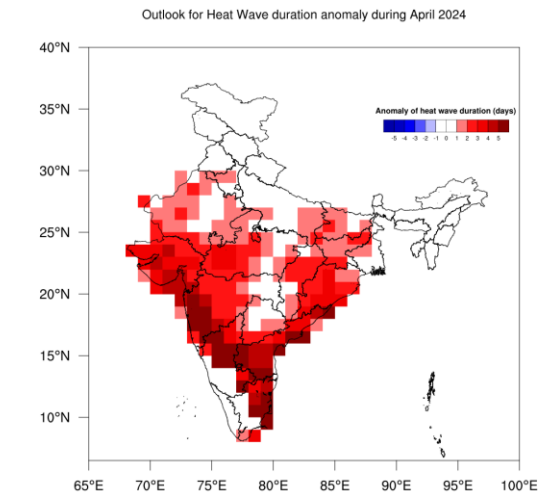


Fig3b. Anomaly of Heat Wave Duration (in days) for April 2024.

probability rainfall forecast for 2024 APR

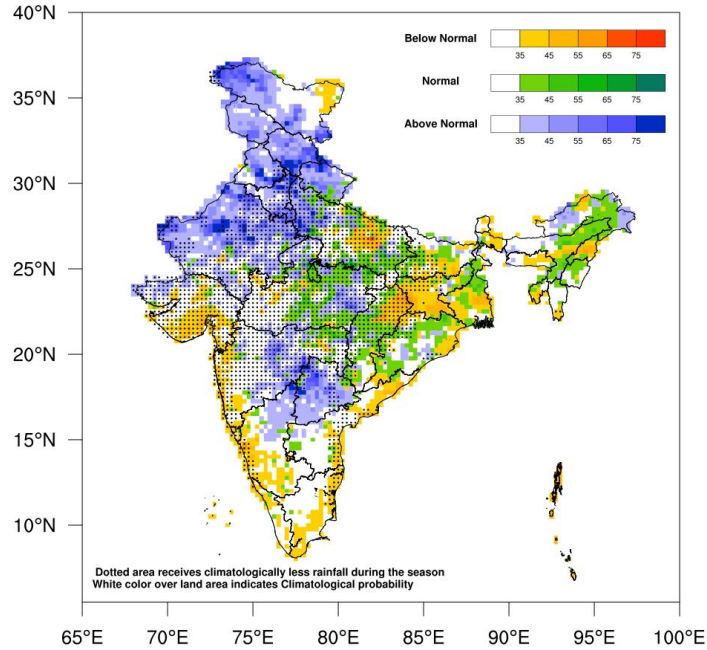


Fig.4. Probability forecast of tercile categories* (below normal, normal, and above normal) for the rainfall over India during April 2024. The figure illustrates the most likely categories as well as their probabilities. The dotted area shown in the map climatologically receives very less rainfall and the white-shaded areas within the land represent climatological probabilities. (*Tercile categories have equal climatological probabilities, of 33.33% each).