



**Earth System Science Organization (ESSO)
Ministry of Earth Sciences (MoES)
India Meteorological Department (IMD)
Climate Research and Services (CR & S)**

Statement on Climate of India during 2022 (January-September)

HIGHLIGHTS

The mean land surface air temperature averaged over India in 2022 (January-September) was $+0.51^{\circ}\text{C}$ above the long-term average (1981-2010 period). The year 2022 was the fifth warmest year on record since nationwide records commenced in 1901.

The all India mean temperatures during the winter (January to February) season was normal with anomaly of -0.04°C while the pre-monsoon (March to May) season and monsoon season (June- September) were above normal with anomaly of $+1.06^{\circ}\text{C}$ and $+0.37^{\circ}\text{C}$ respectively.

The rainfall in 2022 (January-September) over the country as a whole was 107% of its Long Period (1971-2020) Average (LPA) value . The winter season rainfall was 147% of its LPA, pre-monsoon season rainfall was 99% of its LPA and rainfall during the southwest monsoon season was 106 % of its LPA.

During 2022, one severe cyclonic storm formed over Bay of Bengal in the Pre-Monsoon Season. In addition to this, extreme weather events like extremely heavy rainfall, floods, landslide, lightning, thunderstorm, droughts etc. were also experienced in various parts of the country.

Temperatures

The mean land surface air temperature of India in 2022 (January-September) was $+0.51^{\circ}\text{C}$ above the 1981-2010 average which is the fifth warmest since 1901. The mean maximum and minimum temperature for the country was 0.37°C and 0.65°C above the 1981-2010 average respectively. The all India mean temperature was normal during the winter season (anomaly -0.04°C) whereas the pre-monsoon season (anomaly $+1.06^{\circ}\text{C}$) and monsoon season (anomaly $+0.37^{\circ}\text{C}$) were warmer.

The All India mean temperatures during the month of March with anomaly $+1.61^{\circ}\text{C}$ and April with anomaly $+1.36^{\circ}\text{C}$, were second highest since 1901.

The temperatures were consistently 3-8°C above normal breaking many decadal and some all-time records in several parts of the country, including the western Himalayas, the plains of Punjab, Haryana, Delhi, Rajasthan and Uttar Pradesh during March 2022. The states of Odisha, Madhya Pradesh, Gujarat, Chhattisgarh, Telangana and Jharkhand also experienced heatwaves, in some areas, with temperatures ranging from 40–44°C during March. The heatwave conditions also continued in April. Heatwaves also led to increased number of forest-fires. Around 300 large forest fires occurred in the country in April, a third of these in Uttarakhand. By the end of April, almost 70 percent of India was affected by the heatwave. Towards the end of April and in May, the heatwave extended into the coastal areas and eastern parts of India. Anomalously high temperatures during these months adversely affected grain filling and caused early senescence, thus reducing yields.

Rainfall

The rainfall over the country in 2022 (January-September) was 107% of Long Period (1971-2020) Average (LPA) value. The rainfall during the southwest monsoon season was 106% of its LPA. Quantitatively, all India monsoon seasonal rainfall was 92.5 cm against the Long Period Average of 87.0 cm. During the Monsoon season, the South Peninsular and Central India received above normal rainfall (122% and 119% of its LPA respectively) while Northwest India received normal rainfall (101% of its LPA) and east and northeast India received below normal rainfall (82% of its LPA). Considering month to month rainfall variation over the country as a whole, the season was very unique with contrasting month to month variation. The rainfall over the country as a whole was 92%, 117%, 104% and 108% of LPA during June, July, August and September respectively.

High Impact Weather Events (January-September 2022)

In 2022, only one Severe Cyclonic Storm (SCS) 'ASANI' formed over the Bay of Bengal in pre-monsoon season during 7th to 12th May. The system did not cause extreme impacts in India as it weakened into a deep depression before crossing the coast of Andhra Pradesh.

Various parts of the country experienced Extreme Weather Events like extremely heavy rainfall, floods, landslide, lightning, thunderstorm, etc. A few of them are mentioned below. The casualties caused by these extreme events mentioned here are based on the media and the government reports from disaster Management Authorities. Monsoon season witnessed flooding associated with heavy rainfall in many places of the country. The urban flood in Bengaluru city on 5th September caused huge economic loss and damages to property.

The Extreme Weather Events which caused loss of life and damage to property during 2022 is shown in Fig. 1

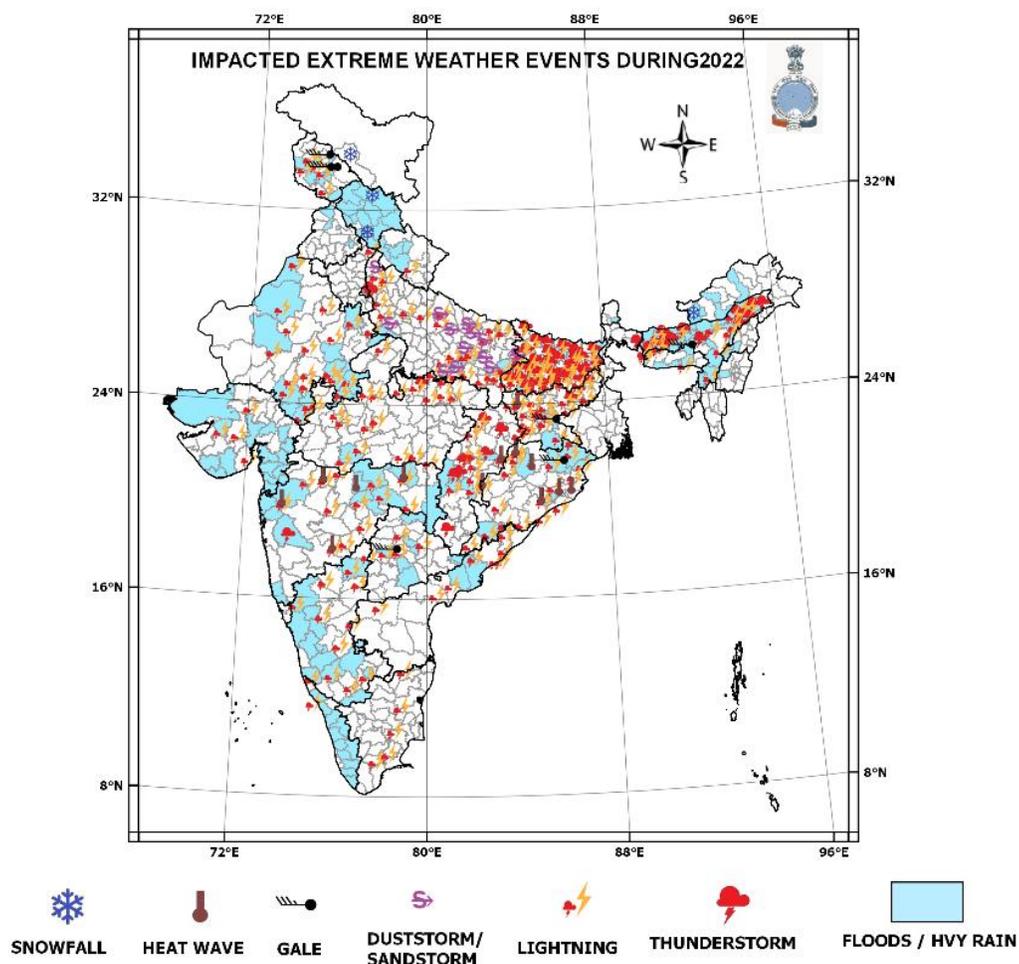


Fig. 1: Major Extreme Weather Events which caused loss of life and damage to property during 2022.

Heavy rainfall, floods and Landslide incidents claimed over 700 lives in different parts of the country. Thunderstorms and lightning claimed more than 900 lives from different parts of the country. Bihar was most adversely affected state during 2022 (January-September), where

thunderstorms claimed more than 310 deaths. Assam was also one of the adversely affected state, where extreme weather events reportedly claimed more than 250 deaths. While, more than 140 lives in Uttar Pradesh, more than 130 lives in Maharashtra state, more than 100 lives in Odisha and Rajasthan were lost due to different extreme weather events.

The other events like snowfall, heat wave, dust storm, gale, hailstorm also affected different parts of the country including loss of life, injury, loss of livestock and damage to crops & public, private property.
