



Extreme weather events through seasons

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Winter (January-February)

While January saw cooler daytime temperatures, **February** remained almost half a degree colder than normal, resulting in 30 cold wave/cold days and 12 hailstorm days. **January** was also abnormally wet (**7th wettest since 1901**) while **February** was drier than normal.

The country experienced an extreme weather event on 39 out of 59 days in the winter months of 2022. The events were spread across 21 states/UTs.

Uttar Pradesh was **the worst hit** as it experienced extreme weather events on 25 days. It was followed by Madhya Pradesh, which experienced extreme

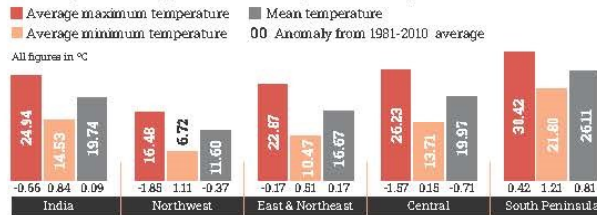
Winter season | January

INDIA 2022 JANUARY

TEMPERATURE

While the mean temperature for the month was just 0.09°C above the long period average (1981-2010), there were visible variations in the average maximum and average minimum temperatures. January saw cooler daytime temperatures (0.66°C below average maximum temperature) and warmer night-time temperatures (0.84°C above average minimum temperature).

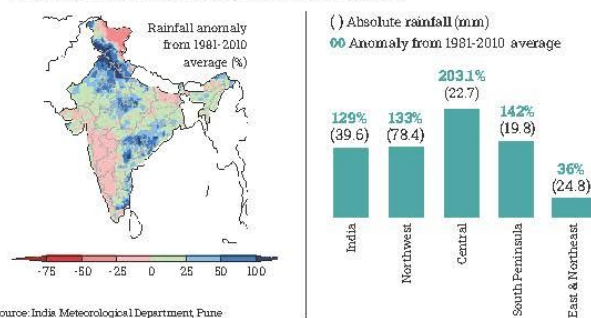
January saw its eighth warmest night-time temperature since 1901



RAINFALL

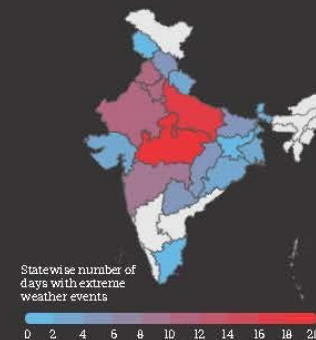
India experienced a wet January (39.6 mm) this year, with rainfall levels over 129 per cent the long period average (1981-2010). Still most of Maharashtra, Karnataka, Kerala and Ladakh recorded deficit rainfall. At least nine stations reported very heavy rainfall (115.6 to 204.4 mm) and 89 stations reported heavy rainfall (64.5 to 115.5 mm of rainfall).

The month was also seventh wettest since 1901



EXTREME WEATHER EVENTS

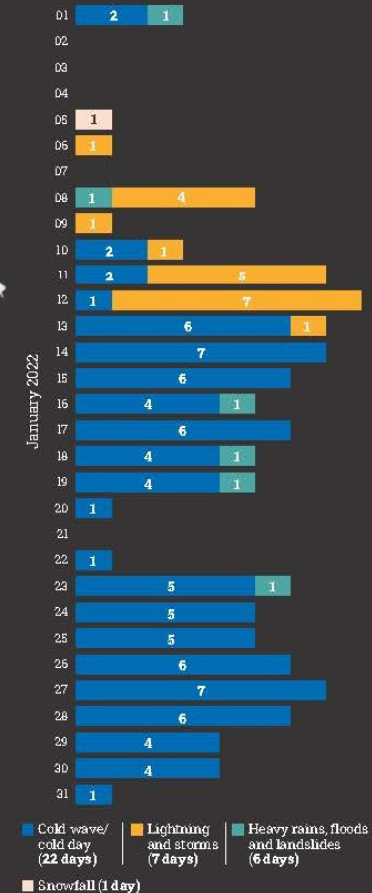
India experienced extreme weather events on 26 out of 31 days in January. This was spread across 20 states/UTs. Madhya Pradesh was the worst hit with extreme weather events on 20 days of the month.



LOSS AND DAMAGE

15 people died due to extreme events in January. Himachal Pradesh (13), Jammu & Kashmir (1) and Maharashtra (1)

16,997 hectares of crop area was affected in Telangana due to hailstorms



Sources: India Meteorological Department, Pune, Disaster Management Division under the Union Ministry of Home Affairs and media reports

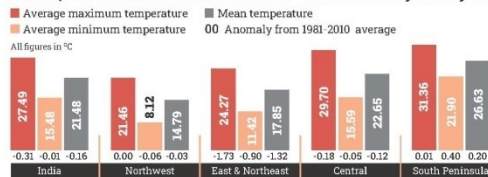
Winter season | February

INDIA 2022 FEBRUARY

TEMPERATURE

In February, the country experienced a marginally colder daytime temperature in comparison to the long period average (1981-2010). East and Northeast India experienced an abnormally cold daytime and night-time temperatures.

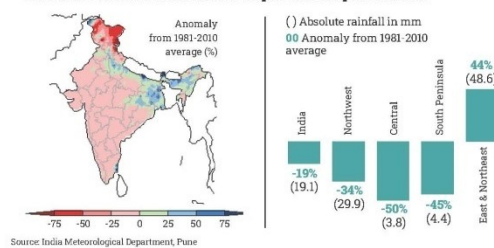
In 2022, East & Northeast India saw its 11th coldest February in 121 years



RAINFALL

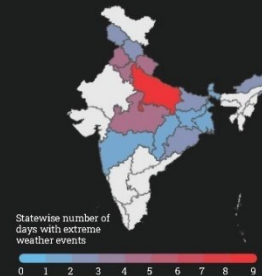
The overall rainfall was 19 per cent lower than the average, but this masks the variations in the country. The East & Northeast region experienced its second wettest February since 1901, after 2001. Then, Central, South Peninsula and Northwest regions recorded 50, 45 and 34 per cent deficit rainfall respectively.

East & Northeast India also saw 44 per cent surplus rainfall



EXTREME WEATHER EVENTS

India experienced extreme weather events on 12 out of 28 days in February. This was spread across 17 states/UTs. Uttar Pradesh was the worst hit with extreme weather events on 9 days in the month. The state experienced a cold wave/ cold day on six days and hailstorms on three days.



LOSS AND DAMAGE

7 people died due to extreme events in Arunachal Pradesh in February

16,187 hectares of crop area was affected in Haryana due to hailstorms

Legend: Cold wave/ cold day (8 days) (blue), Lightning and storms (5 days) (orange), Snowfall (1 day) (grey)

Source: India Meteorological Department, Pune, Disaster Management Division under the Union Ministry of Home Affairs and media reports

Pre-Monsoon (March-May)

Unusually hot March and April led to the early onset of heatwaves this year. **March** was **warmest ever** and the **third driest in 121 years**. It was the **third warmest April** this year. While the temperature was largely normal in May, the month saw heavy rainfall triggering floods in Assam and Meghalaya.

India experienced extreme weather events on 81 out of 92 days in the summer months of 2022. The events were spread across 31 states/UTs. Heatwaves were reported on 51 days, followed by lightning and storms on 43 days and heavy rains, floods and landslides on 29 days..

Rajasthan and Assam were the **worst hit** with extreme weather events on 36 days. They were followed by Madhya Pradesh (32 days).

Pre-monsoon | March

INDIA 2022 MARCH

TEMPERATURE

India experienced its hottest March on record with the maximum or daytime temperature 1.86°C higher than long period average (1981 to 2010). The average minimum or night-time temperature was third highest and mean temperature was second highest since 1901.

In 2022, India recorded its hottest March in 121 years

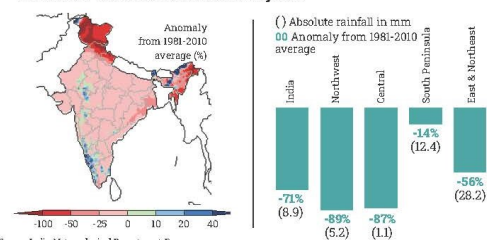
■ Average maximum temperature ■ Mean temperature
■ Average minimum temperature ■ Anomaly from 1981-2010 average
All figures in °C



RAINFALL

India received only 8.9 mm rainfall through the month, making it the third driest March on record after 1909 (7.2mm) and 1908 (8.7mm). This is 71 per cent lower than the average rainfall levels of 30.4 mm. Northwest India and Central India saw deficit rainfall of 89 and 87 per cent respectively.

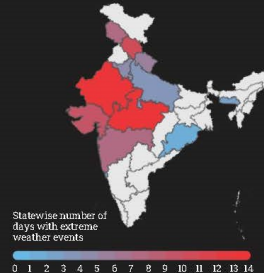
The month was also the driest in 112 years



Source: India Meteorological Department, Pune

EXTREME WEATHER EVENTS

India experienced extreme weather events on 24 out of 31 days in March. This was spread across 13 states/UTs. Rajasthan was the worst hit with extreme weather events on 14 days in the month. The state experienced heatwaves on 12 days and lightning and storms on two days. Madhya Pradesh experienced heatwaves on 13 days.

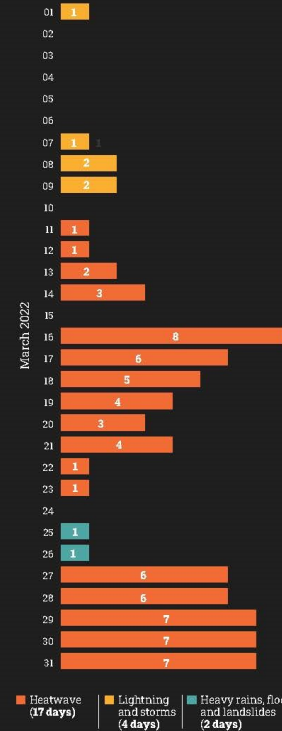


LOSS AND DAMAGE

3 people died due to extreme events in Maharashtra in March

N/A
No crop area was affected across India

INDIA 2022 MARCH



Sources: India Meteorological Department, Pune; Disaster Management Division under the Union Ministry of Home Affairs and media reports

Pre-monsoon | April

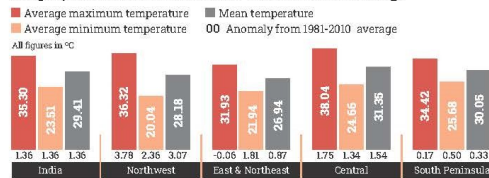
INDIA 2022

APRIL

TEMPERATURE

April was usually warm this year with the average maximum temperature soaring to 35.3°C, the third highest since 1901, after 2010 (35.42°C) and 2016 (35.32°C). India also experienced the second highest mean and average minimum temperatures.

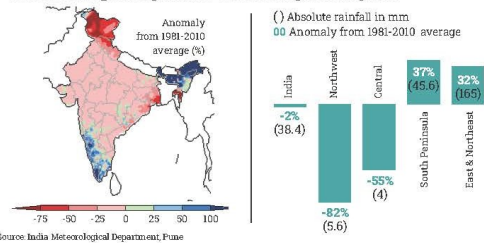
In April, Northwest India was 3.78°C warmer than average



RAINFALL

While India received normal rainfall in the month, there was substantial regional variation. Northwest and Central India received deficit rainfall, and South Peninsula and East and Northeast received surplus rainfall. Rainfall over Northwest India was third lowest since 1901, after 1947 (1.8 mm) and 1954 (4.4 mm).

Northwest region experienced its driest April in 68 years

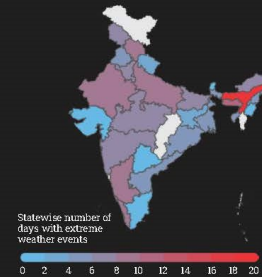


INDIA 2022

APRIL

EXTREME WEATHER EVENTS

India experienced extreme weather events on 28 out of 30 days in April. This was spread across 22 states/UTs. Jharkhand experienced heatwaves on 17 days in the month, followed by Rajasthan and Himachal Pradesh (14 days each).



LOSS AND DAMAGE

61
people died due to extreme events across 10 states/UTs in April

N/A
No crop area was affected across India

Pre-monsoon | May

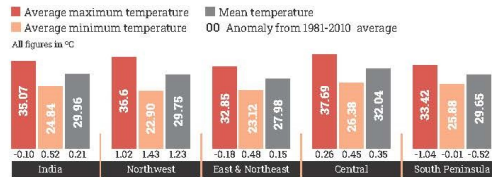
INDIA 2022

MAY

TEMPERATURE

Temperature wise, May was largely normal. The average maximum temperature was 0.1°C below normal, average minimum temperature was 0.52°C above normal and mean temperature was 0.21°C above normal for the country as a whole.

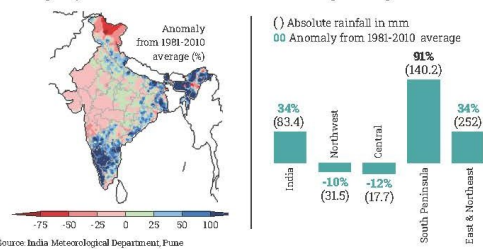
Northwest India saw 1.43°C warmer night-time temperature this May



RAINFALL

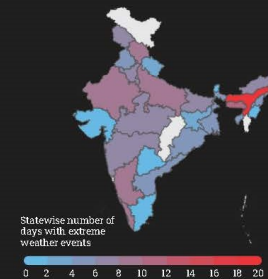
India experienced a wet May (83.4 mm) this year, with rainfall levels over 34 per cent the long period average (1981-2010). While surplus rainfall was recorded in the South Peninsula and East and Northeast states, deficit rainfall was recorded in Northwest and Central India.

This year, South Kamataka saw its wettest May in 121 years



EXTREME WEATHER EVENTS

India experienced extreme weather events on 30 out of 31 days in May. This was spread across 30 states/UTs. Assam experienced heavy rainfall, floods and landslides on 20 days. Himachal Pradesh and Karnataka recorded extreme weather events on 9 days.



LOSS AND DAMAGE

230

people died due to extreme events across 15 states/UTs in May

13,169 hectares of crop area was affected in Andhra Pradesh



Sources: India Meteorological Department, Pune; Disaster Management Division under the Union Ministry of Home Affairs and media reports

Monsoon (June-September)

While India experienced an overall normal monsoon, the season oscillated between dry and wet spells. The country had its **11th warmest August** and **8th warmest September since 1901**. The season began in June with catastrophic floods in Northeast India, especially in Assam and Meghalaya.

The region then went through a dry phase in July and August. In July, Gujarat, Rajasthan and Maharashtra suffered from floods. August brought flood-like conditions in Kerala, Karnataka and central Indian states of Odisha and Madhya Pradesh.

Extreme weather events were reported on **all 122 days** between **June and September 2022**, and they claimed over **2,400 human lives** and damaged **1.8 million hectares** of cropped area and 0.4 million houses.

Monsoon | June

INDIA 2022 JUNE

TEMPERATURE

June was marginally warmer than usual. The average daytime temperature was 0.4°C above the long period average (1981-2010), average night-time temperature was 0.29°C above normal and mean temperature was 0.35°C above normal for the country as a whole.

Central India was a 0.71°C warmer this June

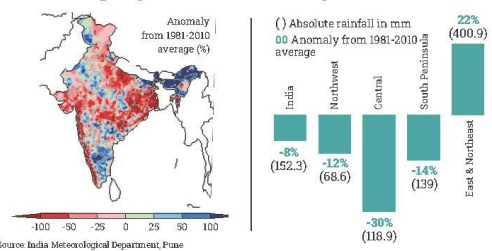
■ Average maximum temperature ■ Mean temperature
■ Average minimum temperature ■ Anomaly from 1981-2010 average
All figures in °C



RAINFALL

India experienced a near-normal rain this June (152.3 mm). With 858.1 mm rainfall, Assam and Meghalaya experienced their wettest June since 1901. In contrast, Kerala and Mahe in Puducherry recorded their fourth lowest June rainfall (308.7 mm) since 1901.

Assam & Meghalaya saw wettest June in 121 years

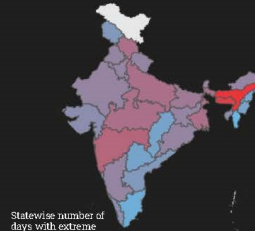


Source: India Meteorological Department, Pune

INDIA 2022 JUNE

EXTREME WEATHER EVENTS

India experienced heavy rains, floods and landslides on all the 30 days of the month. This was spread across 32 states/UTs. The country also experienced lightning and storms (23 days), heatwaves (14 days) and snowfall (4 days).



LOSS AND DAMAGE

757
people died due to extreme events across 24 states/UTs in June

236,868 hectares
of crop area was affected across six states



Sources: India Meteorological Department, Pune; Disaster Management Division under the Union Ministry of Home Affairs and media reports

Monsoon | July

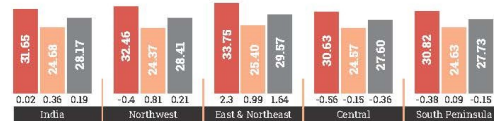
INDIA 2022 JULY

TEMPERATURE

July was marginally warmer than usual. The average daytime was 0.02°C above the long period average (1981-2010), average night-time temperature and mean temperature were 0.36°C and 0.19°C above the long period average for the country as a whole.

East & Northeast India saw its warmest July in 121 years

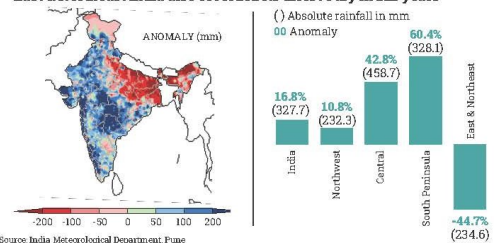
■ Average maximum temperature ■ Mean temperature
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All figures in °C



RAINFALL

India experienced a wetter July (327.7 mm) this year, with rainfall 17 per cent more than the long period average (1981-2010). While surplus rainfall was recorded in the South Peninsula Peninsula, Central India and Northwest, deficit rainfall was recorded in East and Northeast India.

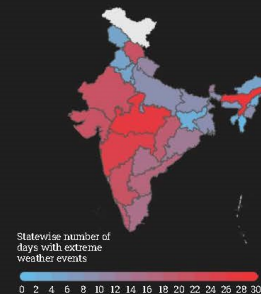
East & Northeast India also recorded its driest July in 121 years



INDIA 2022 JULY

EXTREME WEATHER EVENTS

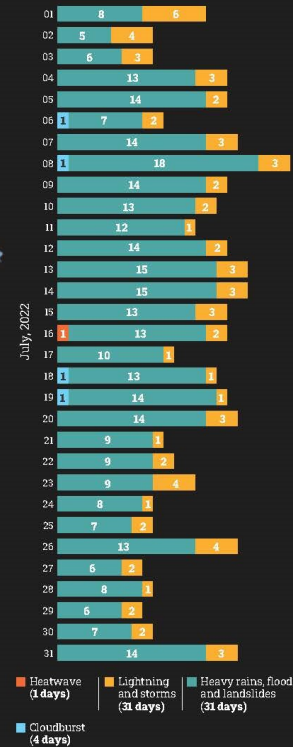
India experienced Heavy rains, floods and landslides and lightning and storms on all the 31 days of the month. The extreme weather events were spread across 32 states/UTs.



LOSS AND DAMAGE

813
people died due to extreme events across 24 states/UTs in June

121,651 hectares
of crop area was affected across eight states



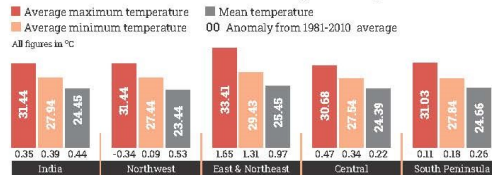
Monsoon | August

INDIA 2022 AUGUST

TEMPERATURE

August was warmer than usual. India's average minimum temperature for the month was fourth highest with 24.45°C after 2020 (24.73°C), 1931 (24.52°C), 2009 (24.46°C).

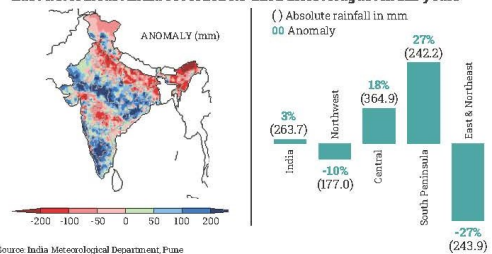
East & Northeast India saw its warmest August in 121 years



RAINFALL

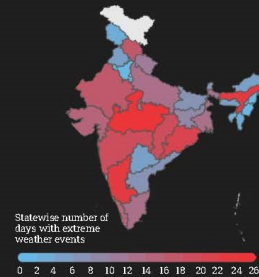
India experienced a near-normal rain this August (263.7 mm). With 243.9 mm rainfall, East and Northeast India experienced their third lowest rainfall since 1901. In contrast, South Peninsula and Central regions recorded their fourth highest rainfall for August in 20 years

East & Northeast India recorded its third driest August in 121 years



EXTREME WEATHER EVENTS

India experienced heavy rains, floods and landslides on all the 31 days of the month. They were spread across 31 states/UTs. Madhya Pradesh was the worst hit with extreme weather events on 27 days. It was followed by Assam and Karnataka with 22 days each.

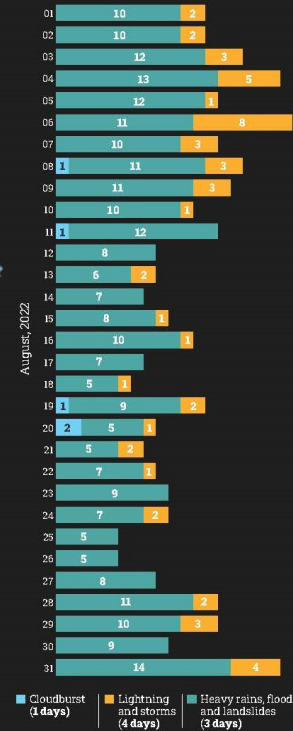


LOSS AND DAMAGE

466 people died due to extreme events across 22 states/UTs in August

756,538 hectares of crop area was affected across seven states

INDIA 2022 AUGUST



Sources: India Meteorological Department, Pune; Disaster Management Division under the Union Ministry of Home Affairs and media reports

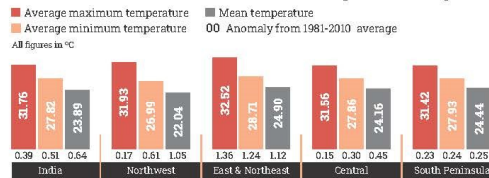
Monsoon | September

INDIA 2022 SEPTEMBER

TEMPERATURE

September was warmer than usual. India's average minimum temperature was third highest with 23.89°C after 2020 (24.08°C) and 2021 (24.06°C).

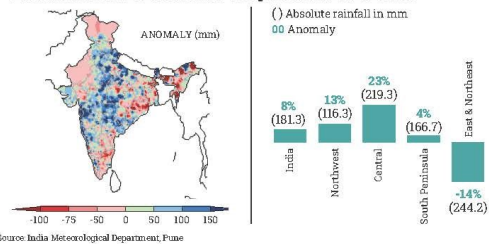
East & Northeast India saw its fourth warmest September in 121 years



RAINFALL

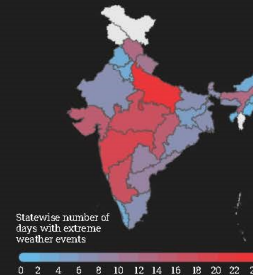
India experienced a near-normal rain this September (181.3 mm). Central and Northwest India experienced 23 and 13 per cent surplus rainfall respectively. In contrast, East & Northeast India recorded a 14 per cent deficit rainfall.

East & Northeast India also saw a 14 per cent rainfall deficit



EXTREME WEATHER EVENTS

India experienced extreme weather events on all the 31 days of the month. This was spread across 29 states/UTs. Assam experienced heavy rainfall, floods and landslides in 30 days. On all the days, the country experienced heavy rains, floods and landslides. India also experienced lightning and storms (30 days), cloudburst (3 days) and heatwave (1 day).



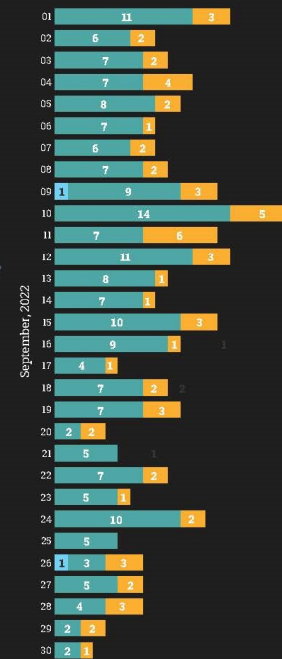
LOSS AND DAMAGE

395
people died due to extreme events across 22 states/UTs in September

682,134 hectares
of crop area was affected across seven states

Sources: India Meteorological Department, Pune; Disaster Management Division under the Union Ministry of Home Affairs and media reports

INDIA 2022 SEPTEMBER



Cloudburst (2 days) Lightning and storms (28 days) Heavy rains, floods and landslides (30 days)

Thank You

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