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Kishtwar flash flood: How climate change has contributed to extreme weather events in J&K

550 people have been killed in 2,800 extreme weather events in J&K from 2010-22. Disasters like the flash flood in Kishtwar have been driven by rising temperatures, changes in the nature of western disturbances

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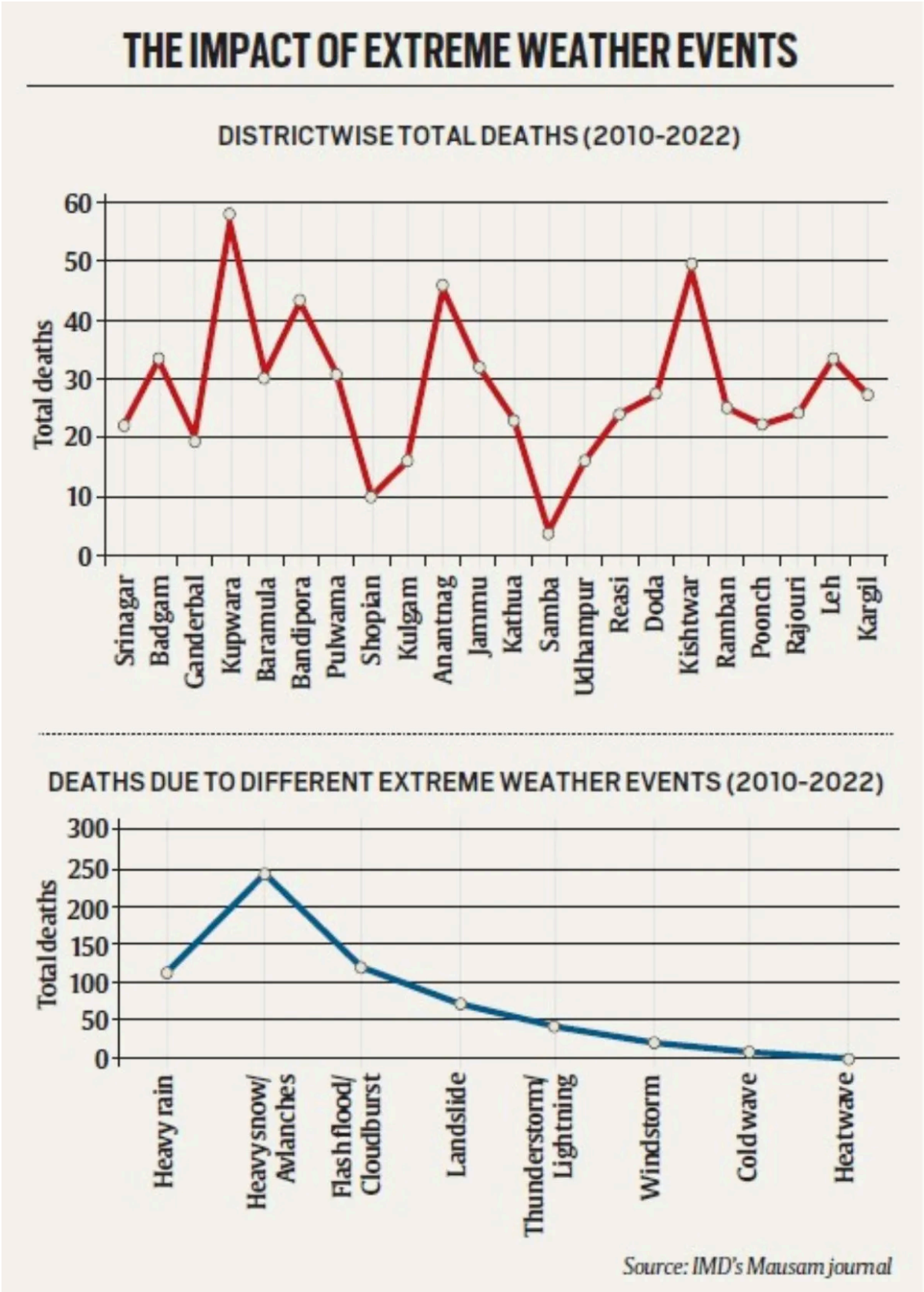
Houses damaged after a cloudburst, in Kishtwar district, Jammu and Kashmir, Thursday, Aug. 14, 2025. (PTI Photo)

At least 65 people have been killed after torrential rain triggered a flash flood at a remote village in Jammu & Kashmir's Kishtwar district on Thursday. The incident took place at

Chasoti, the last motorable village on the way to the Machail Mata temple. More than 50 people are missing.

While experts hesitate to attribute a single extreme weather event solely to climate change, they point out that flash floods and wildfires are becoming more frequent and intense due to the global rise in temperatures and changes in weather patterns.

In J&K as elsewhere, the incidence of extreme weather events has increased with rising average temperatures, leading to the deaths of thousands of people in recent years.



Extreme weather events in J&K

Between 2010 and 2022, J&K witnessed 2,863 extreme weather events in which 552 deaths were reported, according to a 2024 study, 'Extreme weather events induced mortalities in

Jammu and Kashmir, India during 2010-2022', published in Mausam, the quarterly journal of the India Meteorological Department (IMD).

The analysis was carried out by IMD scientists Mukhtar Ahmed, Sonam Lotus, Farooq Ahmad Bhat, Amir Hassan Kichloo, and Shivinder Singh, with Bappa Das, a researcher at the Indian Council of Agricultural Research.

During these 12 years, thunderstorms — characterised by strong winds accompanied by lightning and sometimes precipitation — and heavy rain occurred frequently.

While there were 1,942 instances of thunderstorms, heavy rain — defined as an incident in which a weather station receives 64.5-115.5 mm of rain in 24 hours — took place 409 times, the study said.

Other frequent extreme weather events included flash floods (triggered by intense rainfall over a very short duration) and landslides, which occurred 168 and 186 times respectively.

While there were just 42 instances of heavy snow (when a station receives more than 30 cm of snowfall in 24 hours) during this period, they killed 182 people, the heaviest toll extracted by any extreme weather event. The number of deaths due to flash floods, heavy rain, and landslides were 119, 111, and 71 respectively.

The analysis also showed that the largest number of deaths due to flash floods occurred in Kishtwar (where Thursday's disaster occurred), Anantnag, Ganderbal, and Doda.

The study noted that "for the union territory as a whole, heavy rain and heavy snow have been two major disasters causing mortality, though flash floods, thunderstorms and windstorms are gaining importance".

The reasons for this situation

Although several factors contribute to the occurrence of extreme weather events in J&K, the three significant drivers behind these events are rising temperatures, the changing pattern of Western Disturbances, and the region's topography.

RISING TEMPERATURES: J&K is located in the western Himalayas, a region that has experienced a two-fold increase in temperature compared to the Indian subcontinent as a whole post-2000 ('Delving into Recent Changes in Precipitation Patterns over the Western Himalayas in a Global Warming Era', Global Warming — A Concerning Component of Climate Change, 2023).

Due to this, the western Himalayas have witnessed increased mean and extreme precipitation. This is because warmer temperatures allow the atmosphere to hold more water vapour — for every 1-degree-Celsius rise in average temperature, the atmosphere can hold about 7% more moisture. This leads to an increase in precipitation intensity, duration, and/or frequency, which ultimately causes severe flooding.

Also, increased temperatures have shrunk glaciers in the region, resulting in an increase in the number of glacial lakes. Their water, when released, can cause major flooding in downstream areas.

Mahesh Palawat, who works with Skymet Weather Services, told Climate Trends, a Delhi-based climate research organisation, on Friday, "Since these lakes are not centuries old, the glacial lake edges are very unstable and prone to erosion, melting, and sudden failures. Whenever there is a spell of heavy rain, water tends to overflow and bring down slush and unconsolidated sediment, causing more damage downstream."

CHANGING NATURE OF WESTERN DISTURBANCES: Experts suggest that J&K could be witnessing more flash floods and rain due to global warming-induced changes in the nature of western disturbances. These are east-moving rain-bearing wind systems that originate beyond Afghanistan and Iran, and pick up moisture from the Mediterranean Sea, Black Sea, Caspian Sea and Arabian Sea.

While western disturbances are most common during the boreal winter months (December to March), they have now begun to impact weather outside the winter season. This has increased the risk of floods and heavy rain in India's Himalayan states.

In May, Dr K J Ramesh, a former director general of meteorology at IMD, said: "Global warming has led to rapid warming of the Arabian Sea, which then emits more moisture northwards… When the amplitude of western disturbances extends up to the North Arabian Sea, more moisture is fed into the system, resulting in intense weather activity over the hills."

TOPOGRAPHY: J&K's hilly terrain makes it more vulnerable to extreme weather events.

Sachchida Nand Tripathi, dean of Kotak School of Sustainability at IIT-Kanpur, told Climate Trends, "Topographically, the Himalayas comprise a series of diverse hill ranges that have a profound effect on weather patterns. One major factor is orographic rainfall — when moist air is forced to rise over the mountains, cooling and condensing into heavy precipitation."