



Amarnath Flash Flood

For Prelims: Flash Floods, Cloud Bursting, Fundamentals of Physical Geography, Indian Physical Geography, Disaster Management Bodies, NDRF, SDRF

For Mains: Geographical Factors for Flash Floods and Cloud Bursting, Disaster Management Bodies and their role, Fundamentals of Physical Geography, Indian Physical Geography

Why in the News?

Recently, [flash floods](#) caused landslips near the Baltal base camp in central Kashmir's Ganderbal area.

- At least 13 people, mainly Amarnath pilgrims, have died and dozens went missing after flash floods.

What do we Need to know about Amarnath?

- Amarnath Temple is a **Hindu shrine located in Jammu and Kashmir, India.**
- The cave is situated at an altitude of 3,888 m, about 100 km from [Srinagar](#), the summer capital of **Jammu and Kashmir**, reached through Pahalgam town.
- The shrine represents an important part of **Hinduism.**
- The Amarnath yatra resumed after three years this year.
- The annual yatra has twin routes of **Pahalgam in south** and **Sonamarg in central Kashmir** to reach the cave shrine:

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What do we know about the Amarnath Flash Flood?

▪ Flash Flood:

- These are **sudden surges** in water levels generally during or following an intense spell of rain.
- These are **highly localised events of short duration** with a very high peak and usually have **less than six hours between the occurrence of the rainfall and peak flood**.
- The flood situation worsens in the presence of **choked drainage lines or encroachments obstructing the natural flow of water**.

▪ Causes:

- It may be caused by **heavy rain** associated with a severe **thunderstorm**, **hurricane**, **tropical storm**, or **meltwater from ice or snow** flowing over ice sheets or snowfields.
- Flash Floods can also occur due to **Dam or Levee Breaks**, and/or **Mudslides** (Debris Flow).
- In areas on or near **volcanoes**, flash floods have also occurred after eruptions, when glaciers have been melted by the intense heat.
- The intensity of the rainfall, the location and distribution of the rainfall, the land use and **topography, vegetation** types and growth/density, soil type, and soil water- content all determine just how quickly the Flash Flooding may occur, and influence where it may occur.

What do we know about Cloudburst?

▪ About:

- Cloudbursts are **short-duration, intense rainfall** events over a small area.
- It is a weather phenomenon with unexpected precipitation **exceeding 100mm/h** over a geographical region of approximately 20-30 square km.
- In the Indian Subcontinent, it generally occurs when a **monsoon** cloud drifts northwards, from the **Bay of Bengal** or the **Arabian Sea** across the plains then on to the Himalaya that sometimes brings 75 millimetres of rain per hour.

▪ Occurrence:

- The **relative humidity and cloud cover is at the maximum level** with **low**

temperature and slow winds because of which a high amount of clouds may get condensed at a very rapid rate and result in a cloudburst.

- As **temperatures increase**, the atmosphere can hold more and more moisture and this **moisture comes down as a short very intense rainfall** for a short duration probably half an hour or one hour resulting in **flash floods** in the mountainous areas and urban floods in the cities.

▪ **Cloudburst are Different from Rainfall:**

- Rain is condensed water falling from a cloud while cloudburst is a sudden heavy rainstorm.
- Rain over **100mm per hour is categorized as a cloudburst.**
- The cloudburst is a **natural phenomenon**, but occurs quite unexpectedly, very abruptly, and rather drenching.

▪ **Consequences of Cloudbursts:**

- **Flash floods**
- **Landslides**
- Mudflows
- Land caving

Why do cloudbursts occur in hilly areas like Amarnath?

- In hilly areas, sometimes saturated clouds ready to condense into rain cannot produce rain, due to the upward movement of the very warm current of air.
 - Instead of falling downwards, **raindrops are carried upwards by the air current.** New drops are formed and **existing raindrops increase in size.**
 - After a point, the **raindrops become too heavy** for the cloud to hold on to, and **they drop down together in a quick flash.**
- **A study published in 2020** examined the meteorological factors behind the cloudburst over the **Kedarnath** region, where a cloudburst aided the devastating 2013 floods.
 - It found that during a cloudburst, the relative humidity and cloud cover was at the maximum level with low temperature and slow winds.

[Source: TH](#)

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