Disaster Management · GS - I

What is the phenomenon of ‘cloudbursts’? Explain.

EXAM YEAR	PAPER	SUBJECT
2024	GS - I	Disaster Management

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Extreme rainfall, 100 mm/hour, localised phenomenon, cumulonimbus clouds, orographic uplift, convection, moisture convergence, Himalayan region, flash floods, landslides, climate vulnerability

Model Answer

Introduction

A cloudburst is an exceptionally intense and highly localised rainfall event in which a very large amount of rain falls over a small area within a short period. In India, it is commonly associated with intense rainfall of around **100 mm or more in an hour**.

Formation

1. **Moisture availability:** Large quantities of moisture are transported into the atmosphere.
2. **Strong convection:** Warm, moist air rises rapidly, producing towering cumulonimbus clouds.
3. **Orographic lifting:** In mountainous regions, such as the Himalayas, moist air is forced upwards by steep terrain.
4. **Moisture convergence:** Converging air currents can sustain intense convective activity.
5. **Sudden precipitation:** Rapid condensation and downdrafts result in extremely heavy rainfall over a small geographical area.

Impacts

Cloudbursts can trigger flash floods, landslides, debris flows, infrastructure damage, loss of life and disruption of transport and communication networks. Their impacts are particularly severe in fragile mountainous regions.

Conclusion

Cloudbursts are primarily a localised extreme-weather phenomenon. Improved Doppler radar coverage, local early-warning systems, hazard mapping, resilient infrastructure and community preparedness are crucial for reducing their disaster impact.

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