



Mains Practice Question

Q. "The Himalayan region is simultaneously India's water tower and disaster epicenter." Critically examine in light of glacier retreat and hydropower expansion. (250 words)

10 Sep, 2025 GS Paper 3 Disaster Management

Approach :

- Introduce with brief information about Himalayas
- Water Tower: Lifeline of the Subcontinent
- Development versus Disaster in the Himalayas
- Balancing Development and Sustainability
- Conclude suitably

Introduction:

The **Himalayas**, often termed the "**Third Pole**", contain the largest reserves of ice outside the Arctic and Antarctic. They feed major rivers such as the **Ganga, Brahmaputra, and Indus, making them India's water tower**. At the same time, the region is ecologically fragile, geologically young, and seismically active, rendering it a **disaster hotspot**.

Body :

Himalayas as India's Water Tower:

- **Glacial Melt and Rivers:** The Himalayas sustain perennial river systems critical for food, water, and energy security for over **600 million people in India**.
- **Hydropower Potential:** Government estimates show that the **Himalayas have a potential to generate 115,550 MW of electricity**. It makes the region a cornerstone for India's renewable energy ambitions.
- **Agricultural Dependence:** Irrigation from Himalayan-fed rivers sustains the Indo-Gangetic plains, one of the world's most fertile regions.

Himalayas as Disaster Epicenter:

- **Glacier Retreat:** There is significant decline in glacier mass due to anthropogenic activities, raising risks of **Glacial Lake Outburst Floods (GLOFs)**
- **Seismic Vulnerability:** The Himalayas lie in **Seismic Zones IV and V**, prone to earthquakes and landslides. There has been an increasing trend of disasters in the Himalayan regions.
- **Hydropower Risks:** Projects such as in **Uttarakhand and Himachal Pradesh** exacerbate slope instability, deforestation, and flash floods as seen in the **Chamoli disaster (2021)**.
- **Unplanned Development and Infrastructure:** The rapid and unplanned development of the Himalayan regions has led to significant rise in the frequency and occurrence of disasters for example **Josimath landslides**.

Balancing Development and Sustainability

- **Reducing Infrastructural Load:** Adopt a **“hydropower-lite” model** with smaller, run-of-the-river projects in order to reduce load on already fragile landforms.
 - Rather than incessant development undertake a sensitive approach towards infrastructural development in the himalayan landforms.
- **Enhancing Alert Mechanisms:** Strengthen **early warning systems** for GLOFs and landslides.
- **Landform Mapping and Prediction:** Enforce **carrying capacity studies** before new infrastructure.
- **Enhance Coordination:** Promote regional cooperation under initiatives like the **International Centre for Integrated Mountain Development (ICIMOD)**.

Conclusion:

As the **NITI Aayog’s report on Himalayan sustainability** warns, unchecked exploitation could imperil both ecology and livelihoods. A future-ready policy must treat the Himalayas not merely as a resource base, but as a fragile ecosystem requiring **resilient, inclusive, and ecologically sensitive development**.

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