



# Towards Resilient Indian Himalayan Region

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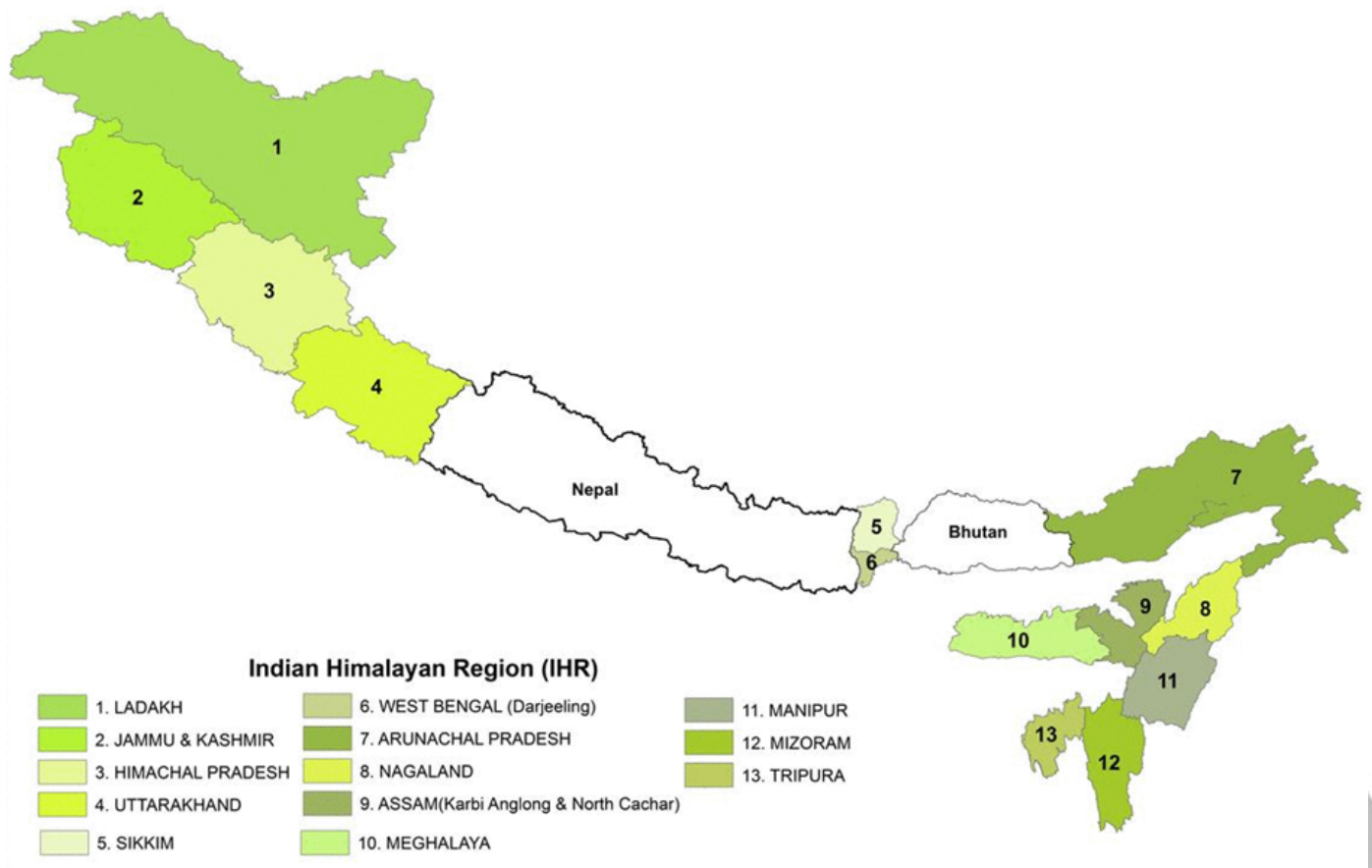
## Why in News?

The [Supreme Court of India](#) has raised alarm over **unchecked infrastructure development, unregulated tourism, and ecological degradation in Himachal Pradesh.**

- It highlights the urgent need for sustainable, ecologically sensitive governance and climate-resilient development models to safeguard the [Indian Himalayan region's future.](#)

## Indian Himalayan Region

- The **Indian Himalayan Region is stretching across 2500 km covers 13 Indian States/Union Territories** (namely Jammu and Kashmir, Ladakh, Uttarakhand, Himachal Pradesh, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Assam and West Bengal)
- **It covers approximately 16.2% of India's geographical area** and supports over 50 million people directly.
- The vegetation ranges from **tropical forests (in the foothills)** to **temperate forests (in the middle ranges)** to **alpine meadows (at higher altitudes).**
- As the “**Water Tower of India**”, they feed **10 major rivers including the Ganga and Indus**, sustaining agriculture and drinking water for over 600 million people.
  - Ecologically, they host **3,160+ endemic plant species**, rare fauna like the snow leopard, and span multiple climate zones.
  - Economically, they **support organic farming (e.g., Sikkim model), tourism contributing over 10% to hill states' GDP**, and major hydropower projects like **Arunachal's 13,000 MW Lohit Basin initiative.**
  - Strategically, they shield India against potential geopolitical threats.



## What are the Key Threats that the Indian Himalayan Region is Facing?

- **Significant Forest Loss:** Between 2019 and 2021, the **Himalayan states experienced a loss of 1,072sqkm of forest cover**, increasing vulnerability to landslides, biodiversity loss, and soil erosion.
- **Decline in Natural Springs:** **Nearly 50% of natural springs across the Indian Himalayan Region are drying up (NITI Aayog)**, leading to water scarcity and impacting local communities' water needs for drinking, agriculture, and sanitation.
- **Glacier Retreat:** Himalayan glaciers are retreating rapidly, increasing the risk of **Glacial Lake Outburst Floods (GLOFs)**. For instance, Arunachal Pradesh alone has lost 110 glaciers over the past 32 years, signalling an alarming trend of cryospheric degradation.
  - **GLOFs** have claimed over 12,000 lives in the past 200 years.
- **Rise in Landslides:** Increased land use for development have made certain Himalayan states (e.g., **Himachal Pradesh**) highly landslide-prone, often triggered or worsened by heavy rainfall and infrastructural development.
  - **Deforestation and construction** have accelerated soil erosion, slope instability, and loss of soil fertility, fueling more frequent landslides and land subsidence incidents, such as witnessed in **Joshimath in 2023**.

## What are the Key India's Initiatives Related to the Indian Himalayan Region?

- [Indian Himalayas Climate Adaptation Programme \(IHCAP\)](#)
- [SECURE Himalaya Project](#)
- [Integrated Himalayan Development Program \(IHDP\)](#)
- [National Mission for Sustaining the Himalayan Ecosystem \(NMSHE\)](#)

## What Measures can be Adopted to Promote Sustainable Development in the Himalayan Region?

- **Eco-Friendly Infrastructure Development:** Enforce **scientific slope cutting and tunneling techniques** to prevent landslides.
  - Promote **green buildings** using local materials and energy-efficient designs.
  - Adopt the **“Build Less, Build Smart”** principle for sustainable hill architecture.
- **Water Resource Conservation:** Restore and maintain **springs, natural aquifers, and catchments** under programs like [Jal Shakti Abhiyan](#).
  - Promote **rainwater harvesting** and **micro-irrigation** systems in farms and hill settlements.
- **Ecotourism and Sustainable Livelihoods:** Shift from mass tourism to **eco-tourism and homestays**, with strict **carrying capacity norms**.
  - Train local youth as **nature guides, biodiversity monitors**, and in handicraft-based livelihoods.
  - Implement **waste management rules** in hill towns and tourist hotspots.
- **Forest and Biodiversity Conservation:** Promote **community-based forest management** (e.g., **Van Panchayats** in Uttarakhand).
  - Promote plantation of **indigenous tree species** to reduce slope erosion and enhance carbon sequestration.
- **Disaster-Resilient Planning:** Mandate **hazard zoning maps** in all construction approvals. Expand **early warning systems** for landslides, flash floods, and GLOFs.
  - Promote **climate-resilient rural housing** under [PM Awaz Yojana \(Gramin\)](#) in fragile zones.
- **Use of Technology and Data:** Use **remote sensing, drones, and GIS** for monitoring deforestation, slope instability, and glacial changes.
  - Develop **real-time dashboards** for tourist pressure, weather alerts, and construction tracking.
  - Deploy **IoT sensors in dams and rivers** to monitor water flow and outburst risks.

### Related Keywords for Mains

- **Climate & Cryosphere**
  - **“From Ice Reserves to Risk Reservoirs”** - Glacial lakes turning into GLOF threats.
  - **“Cryospheric Collapse”** - Impact of rising temperatures on glacier stability.
- **Development vs Ecology**
  - **“Four Lanes into Fragility”** - Highway projects weakening mountain slopes.
  - **“From Eco-Zones to Erosion Zones”** - Poorly planned development disrupting natural systems.
- **Conservation & Sustainability**
  - **“Ecology is Elevation’s Insurance”** - Environment is critical for mountain safety.
  - **“Green Altitudes, Not Grey Attitudes”** - Promoting eco-sensitive infrastructure in hills.
- **Governance & Policy**
  - **“Combining Environmental Impact Assessment (EIA) with Ecological Impact Consciousness (EIC)”** - Making sustainability a mindset, not just a checklist.
  - **“From GDP to GEP (Gross Ecological Product)”** - Incorporating ecological value in policy metrics.

#### **Drishti Mains Question:**

The Indian Himalayan Region is becoming a hotspot for climate-induced disasters. Discuss the role of governance, community participation, and scientific planning in building resilience.

**Mains:**

Q1. Differentiate the causes of landslides in the Himalayan region and Western Ghats. (2021)

Q2. How will the melting of Himalayan glaciers have a far-reaching impact on the water resources of India? (2020)

Q3. "The Himalayas are highly prone to landslides." Discuss the causes and suggest suitable measures of mitigation. (2016)

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