

Hand out: Summer Field School [Online] on
MOUNTAIN ECOSYSTEMS AND RESOURCE MANAGEMENT

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Forest Degradation in Himalayan states:

- Climate impact of black carbon emissions due to firewood consumption has resultant effects on forest degradation over time.
- Household consumption levels and demographic reasons as significant factors for forest degradation in the Himalayan region.
- Specifically, they measure the effects of economic growth on forest degradation in terms of household consumption levels and conclude that demographic factors such as rise in population and increased fragmentation of rural households help explain forest degradation comparatively more significantly than economic growth. Further, they conclude that increased inequality or poverty levels do not seem to affect forest degradation.
- (<https://www.teriin.org/article/firewood-consumption-and-forest-degradation-himalayan-states-review-research-gaps>)

Soil erosion and risk assessment in Indian Himalayan region:

- Soil erosion is the major cause of land degradation, which has become a worldwide environmental problem that degrades soil productivity and water quality.
- A study was carried out to estimate the average annual soil erosion and risk area in the Uttarakhand State of Indian Himalayan region using various high-resolution geospatial data layers such as Global rainfall erosivity database, SOILGRIDS, CartoDEM as well as LULC data by employing Revised universal soil loss equation (RUSLE) model in a GIS environment.
- These data layers provided spatially distributed reliable information of erosion factors.
- The average annual soil erosion rate was estimated as 27.45 t ha⁻¹ yr⁻¹, totaling to an amount of 119Mt yr⁻¹ as potential soil loss from the state.
- Among the various physiographic regions, total soil loss amounts were estimated to be 2.94, 5.08, 5.35, 7.48, 15.55 and 82.88 Mt yr⁻¹ from Tarai, Trans Himalaya, Bhabhar (foothills), Shivalik, Greater Himalaya and Middle Himalaya respectively.
- Mean erosion rates estimated for major river basins were found to be 14.64, 22.22, 31.23, 33.24, 36.86 and 38.00 t ha⁻¹yr⁻¹ for Ramganga, Ganga, Alaknanda, Kali, Bhagirathi and Yamuna basins respectively.
- Among the different slope classes, very steep slopes (>60%) showed the highest mean soil loss rates of 40.11 t ha⁻¹yr⁻¹ amounting to total soil loss of 50.28Mt yr⁻¹.
- Study revealed that 20.34% of the area is classified as a very severe erosion class (>40 t ha⁻¹ yr⁻¹).
- (<https://www.sciencedirect.com/science/article/pii/S2666765721000107>)

WildFires in Himachal Pradesh::

- Wildfires described as “the worst in a decade” have engulfed Himalayan mountain states in a thick haze and killed at least eight people in the Indian states of Himachal Pradesh and Uttarakhand.
- According to one estimate, the 2021 wildfires in Uttarakhand alone have led to the release of 0.2 megatons of CO₂ – the highest since 2016.
- Since December 2020, over 1,000 wildfires have been recorded in Uttarakhand – a state that has over 45% forest cover in contrast to India’s overall forest cover of 21.67%.
- In Nepal, nearly 200,000 hectares of forest area are lost to wildfires each year.
- Kathmandu’s air pollution level for particles smaller than 2.5 microns (PM_{2.5}) was 15 times higher than the 25 micrograms per cubic metre (µg/m³) ceiling recommended by the World Health Organization for a 24-hour period.
- Nepal’s National Disaster Risk Reduction and Management Authority (NDRRMA) recorded over 2,700 wildfires since November 2020 – the highest in a decade.
- (<https://www.thethirdpole.net/en/climate/fires-ravage-forests-himalayas-threatening-health-biodiversity/>)

Landslides in Himachal Pradesh:

- A catastrophic landslide in Uttarakhand state in India in February 2021 damaged two hydropower plants, and more than 200 people were killed or are missing.
- In August 2021, there was a massive landslide on the Reckong Peo-Shimla highway, a mountainous Indian state of Himachal Pradesh has killed at least 10 people, injured 14 and left dozens trapped after boulders tumbled onto the highway, smashing and burying several vehicles.
- Repeated landslide warnings have been sounded for Indian states and Union territories like Ladakh (the Kargil area), Himachal, Uttarakhand and Sikkim as well as for Nepal.
- The increase in construction projects in the range, including infrastructure such as four-laned roads could lead to disasters such as landslides.
- The hills and mountains of Himachal Pradesh are liable to suffer landslides during monsoons and also in high intensity earthquakes.
- Landslide prone areas of Himachal Pradesh: <https://www.downtoearth.org.in/news/natural-disasters/kinnaur-landslide-exposes-fragile-himachal-landscape-again-78412>