

Himalayas in dire straits

SOE report

By Asha Ramachandran

Not only is the world getting warmer, but in the Himalayan region, we have already crossed one or more “tipping points”, critical thresholds that, when crossed, lead to accelerating and irreversible changes in the region’s climate system, says the recently-released State of India’s Environment 2024 (SOE 2024) report, prepared and brought out every year by the Centre for Science and Environment (CSE) and Down To Earth magazine.

Sounding alarm bells on the Himalayas, the SOE 2024, which was unveiled at the Anil Agarwal Dialogue, an annual conclave organised every year by CSE, speaks of an “uncomfortable trend” projected by the data on disasters in the region, that have led to significant loss of life and damage to property. Between 2013 and 2022, the Himalayan region in India accounted for 44 per cent of all the disasters

reported in the country. Floods, landslides and thunderstorms – 192 in all – constituted the bulk of these incidents.

“The cloudbursts and torrential rains experienced by the western Himalayas and Sikkim in 2023 are curtain-raisers to a future that is already upon us, and will become more pronounced with every passing year of excessive fossil fuel consumption,” the report warns.

Tracking the dramatic rise in the incidence of excess rainfall and cloudbursts in 2023, the report notes that had the excess rainfall been evenly spread across July and August, the months of maximum precipitation, it would have caused a fraction of the damage that it did. But not only did a disproportionate amount of the rain fall in July, but most of it came in a single week at the

beginning of the month, from July 8 to 12.

The catastrophe can be traced directly to the warming of the atmosphere in the Himalayan region. The average warming here has been 1.6 degrees Celcius, against the average of 1 degree Celcius temperature rise in India as a whole, and 1.1 degrees Celcius for the globe. “This level of warming has created what can only be described as an orographic nightmare in the Himalayas,” the report asserts. Orography deals with the interaction between mountain ranges and other uplands, with moisture-bearing winds and temperature changes. This interaction determines not only the micro-climate at different altitudes on the mountain slopes and in the valleys between them but the weather in the river basins and plains into which the rivers



debut.

Between April 2021 and April 2022, 41 incidents of landslides were recorded across the country, of which 38 occurred in the Himalayan states, with Sikkim witnessing the highest number (11). Writes Kiran Pandey, head of CSE's Environment Resources Unit in the CSE report, "A close look at the data shows an uncomfortable trend. In recent decades, these disasters are occurring more frequently and getting more severe, causing a significant loss of life and damage to property."

The worst long-term damage is, however, being recorded in the upper reaches of the Himalayas, and unlike the floods caused by the monsoons, it is relentless. The rise in average surface temperatures in the Himalayas has exceeded 1.6 degrees Celsius and is causing glaciers to melt rapidly and retreat at an accelerating rate.

The ice-melt from the glaciers is forming glacial lakes across the Himalayan range. The number of such lakes in Uttarakhand and east of Himachal Pradesh has increased from 127 in 2005 to 365 in 2015. The increasing frequency and ferocity of cloudbursts is causing these lakes to overflow or burst their banks and cause havoc downstream.

The first such catastrophe occurred in 2013, above Kedarnath. The torrent that raged down the Bhagirathi claimed, officially, 6,074 lives, mostly of pilgrims. A similar "lakeburst" occurred at Chamoli

in Uttarakhand in February 2021. It caused havoc to infrastructure along the Alaknanda for 100 km downstream of the town. In February 2023, the township of Joshimath, also on the Alaknanda river, started sinking as its topsoil had been fatally loosened by the rising incidence and ferocity of cloudbursts, indiscriminate construction along the banks of the river and disturbance of the Earth's crust by a hydropower project of the National Thermal Power Corporation (NTPC). The most recent glacial lake burst occurred in Sikkim on October 4, 2023, and claimed more than 400 lives.

The Hindu Kush Himalayas has seen a 65 per cent faster loss of glacier mass, according to a study by the Nepal-based International Centre for Integrated Mountain Development (ICIMOD). During 2010-19, glaciers in the region lost a mass of 0.28 metre of water equivalent per year (m we) in comparison to 0.17 m we per year in the period 2000-09. The Karakoram Range, which was known to be stable, has also started showing a decline in glacier mass, losing 0.09 m we per year during 2010-19.

The SOE 2024 report quotes Izabella Koziell, ICIMOD's deputy director general, "The glaciers of the Hindu Kush Himalaya are a major component of the Earth system. With two billion people in Asia reliant on the water that glaciers and snow here hold, the consequences of losing this cryosphere are too vast to contemplate. We need leaders to act now to prevent catastrophe."

Overall, the Himalayas have already lost more than 40 per cent of their ice, and are likely to lose up to 75 per cent by the end of this century. This is making the vegetation line in the Himalayas shift upwards at the rate of 11 to 54 m per decade. With 90 per cent of Himalayan agriculture being rainfed, this will make it impossible to sustain the livelihoods of the people who now inhabit the Himalayan region, and endanger the lives of those in the plains who depend on its waters.

Studies say that the western Himalayas had lost 8,340 sq km of permafrost area between 2002-04 and 2018-20; about 965 sq km of area disappeared in the Uttarakhand Himalayas between 1970-2000 and 2001-17. The loss of permafrost can lead to infrastructure damage. "We are already seeing the effects of this, for example, in landslides caused by thawing permafrost," said Dr Miriam Jackson, ICIMOD's senior cryosphere specialist, and one of the speakers at the Anil Agarwal Dialogue.

The head of Dehradun-based Wadia Institute of Himalayan Geology, Dr Kalachand Sain, another speaker at the Dialogue, said, "Stopping development in the Himalayas is not the solution – this development needed to be done properly with guidelines prepared in consultation with all stakeholders. To mitigate disasters, we need to understand their root cause and get everybody — national governments, locals, experts, journalists — involved and interested in addressing them." ■

HUES OF HIMALAYAN FORESTS

By Our Special Correspondent

Alarm bells were set off in the last assessment of India's forests prepared by the Forest Survey of India (FSI), mandated to assess the forest and tree resources of the country, as it reported that forest cover has decreased in five Northeastern states, namely Arunachal Pradesh, Manipur, Meghalaya, Mizoram, and Nagaland. But overall it claims that forest cover has increased which is questionable.

Expressing concern over drop in the forest area, the India State of Forest Report 2021 (ISFR 2021) said there has been a 1,020 sq km loss in the region's overall forest cover. The northeastern region of India, comprising eight states – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura – make up 7.98% of India's landmass. The forest resources in these states account for 23.75% of the total forest cover of the country. The report indicates that there has been a significant increase in the number of small forest patches across the region. This indicates fragmentation of forest cover, which can have adverse effects

on biodiversity and the ecosystem. On the other hand, Uttarakhand, Himachal Pradesh, Jammu and Kashmir and Ladakh have gained two sq km, nine sq km, 29 sq km and 18 sq km, respectively. **In the entire Himalayan region, Arunachal Pradesh has the maximum area under forest cover while Jammu and Kashmir has the least.**

The report attributes the loss in forest cover and deterioration of forest canopy to shifting cultivation, felling of trees, natural calamities and anthropogenic (human activities) pressure, including deforestation, over-grazing and developmental activities. A major chunk of hydro-projects are located in the Himalayan states.

"With deforestation of slopes, environmental degradation processes like soil erosion, slope failures, depletion of soil fertility, scarcity of fuelwood and fodder, increased overland flows, reduced groundwater recharge, loss of biological diversity are accelerated," the Centre for Science and Environment quoted a 1997 paper

by Govind Ballabh Pant Institute of Himalayan Environment and Development, Dehradun.

Add to this the problem of climate change. According to the ISFR 2021, 45-64% of India's forests will be impacted by changing climate and rising temperatures by 2030 leading to more forest fires. Except for Assam, Meghalaya, Tripura, and Nagaland, all states' forests would be extremely sensitive climate hotspots. Ladakh (0.1–0.2% forest cover) is most likely to be impacted, the report says.

According to Geography and You, "Nearly 65% of the total geographical area of the IHR is legally designated as forest land (National Forest Policy, 1988). However, this does not necessarily mean that all this area is actually under forest cover. These parts either remain covered under perpetual snow or are alpine pastures that do not support tree growth

due to harsh climatic conditions. Therefore, in fact, forests cover only about 42% of the total geographical area of the Himalayan region. Of this, 50% is under very good forest cover, and 21% is under dense forest canopy."

This 42% forest consists of tropical deciduous forests in the foothills, temperate forests in the middle altitudes, coniferous, sub-alpine, and alpine forests in higher altitudes. These finally give way to alpine grasslands and high-altitude meadows followed by scrublands.

Forest cover in hill districts

The National Forest Policy (NFP) 1988 envisages a goal of maintaining two third of the area in hills under forest cover. Due to the fragility of hill areas and vulnerability to land degradation, forest cover plays an important role in prevention of soil erosion, land degradation and also maintaining ecological balance and



environmental stability.

Tribal economy, society and culture are intricately linked with forests, which contribute significantly as source of sustenance and livelihood for the tribal community. All districts of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Sikkim fall in the category of tribal districts due to their high tribal population.

As per one estimation reported by CSE, by 2100, only 10 per cent of the Indian Himalayan land area would be covered by dense forests. Western Himalayas' dense forest cover will decrease from 61 per cent in 2000 to 16.8 per cent in 2100; and in eastern Himalayas from 76.2 per cent in 2000 to 38.7 per cent in 2100, said the study.

Sikkim is expected to have the least forest cover by 2100 despite its slower rate of deforestation. This may be because 50 per cent of the state's geographic area lies above timberline where forest growth is not possible, noted the 2006 assessment.

Severe repercussion

A grievous impact of deforestation is soil erosion. In the Himalayan region, the impact of soil erosion can be felt differently in the western and eastern parts. Due to higher rainfall in the northeastern hills (1,500-11,500 millimetres annually) as compared to the northwestern hills (350-

3,000 mm annually), the former is more vulnerable to soil erosion. In the Himalayan region, soil erosion also gives way to river shifting.

Forests are the chief source of livelihood in general and mountains in particular. The Himalayas are responsible for India's ecological security and are a major provider of various forest products and hydro power. The Himalaya is the store house of glaciers, providing perennial river systems for mountain inhabitants as well as millions of people living downstream for settlements, agriculture and industries. Good forest cover in Himalayan states is central to maintain ecological balance and environmental stability as it prevents soil erosion and land degradation.

Way forward

The only strategy is to ensure that forests of Himalayan states are not further degraded. Therefore, urgent need is to utilize the forests in a sustainable manner with focus on minimum depletion. Union government and the respective state governments must lay special emphasis to mitigate all the threats that result in depletion of forest resources through multi-pronged, long-term and integrated approaches, so that Himalayan forests continue to benefit mankind for the present as well as future generations. ■

SERIOUS DOUBTS OVER ACTUAL FOREST COVER; - DR TV RAMACHANDRA



The FSI in its biennial report counts monoculture plantations as forests. "This inclusion is a serious threat, and it leads to the erosion of native forests rich in biodiversity and threatens water sustenance," as Dr TV Ramachandra from the Indian Institute of Science (IISc) Centre for Ecological Sciences puts it. On World Forest Day, the report's finding that over 33% of land in 17 States and Union Territories was covered in forests should have been reason enough to cheer. Instead, the inclusion of plantations has been dubbed as a manipulation. It is not forest cover, but the agro-forestry / commercial forestry which is increasing," he said.

At the heart of this debate is the biodiversity richness of forests compared to the monoculture single-crop plantations. "Indeed, monoculture is a threat to biodiversity. Categorising plantations as forests has another disastrous impact. In regions where native forests have made way for plantations, landslides and mudslides have seen a dangerous spike in both frequency and ferocity. ■