PRESS RELEASE

CSTEP Study: High-Intensity Rainfall Events Expected in North-Eastern India

For Immediate Release

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The Center for Study of Science, Technology and Policy (CSTEP)—a Bengaluru-based think tank—published a study on the climate of north-eastern India titled '*District-Level Changes in Climate: Historical Climate and Climate Change Projections for the North-Eastern States of India*'. The study projects changes in temperature and rainfall patterns in Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura over the next three decades (2021–2050) compared to the historical period (1990–2019). It analysed two representative scenarios: moderate emissions (RCP 4.5) and high emissions (RCP 8.5).

Highlights from the study

- Historically (1990–2019), temperature and rainfall have increased, and rainfall variability is high across all the north-eastern states.
- Climate change projections by CSTEP indicate an overall warming of both summer and winter minimum temperatures, an increase in the number of rainy days (>2.5 mm rainfall/day), and an increase in the number of heavy rainfall events across almost all the districts of the north-eastern states.
- Summer maximum and the winter minimum temperatures are projected to increase by 1°C to 1.5°C under the RCP 4.5 scenario and 1°C to 2°C under the RCP 8.5 scenario. The winter minimum temperature is projected to increase largely by 1°C to 1.5°C under the RCP 4.5 scenario and 1°C to 2°C under the RCP 8.5 scenario in a majority of the districts of north-east India.
- The number of rainy days is projected to increase in the 2030s in all the north-eastern districts compared to the historical period. The increase is by 1 to 24 days under the RCP 4.5 scenario, with the maximum increase projected in Sikkim and a minimum increase projected in Assam. The increase is by 1 to 22 days under the RCP 8.5 scenario, with the maximum increase projected in Sikkim.
- Rainfall during kharif (June to September) and rabi (October to December) seasons is projected to increase in the 2030s in almost all the districts of north-eastern India compared to the historical period.
- An increase in high-intensity (51–100 mm/day) and very high-intensity (>100 mm/day) rainfall events is projected in the 2030s across all the districts of north-east India compared to the historical period. The increase in high-intensity rainfall events per annum is by one to four events under the RCP 4.5 scenario and one to five events under the RCP 8.5 scenario.
- A decline in rainfall deficient years is projected in the 2030s across almost all the districts of north-east India compared to the historical period. The decline in rainfall deficient years is by 1 to 4 years out of 30 years under the RCP 4.5 scenario and 1 to 5 years under the RCP 8.5 scenario in the various districts of north-east India.

Climate projections for the north-eastern states at the district level for the period 2021–2050 (the 2030s) **indicate a warmer and wetter future with an increase in heavy rainfall events**. The heavy rainfall events are projected to be more frequent and more intense, and the projections are largely in agreement with the literature available at the global, South Asia, and national levels.

In the north-east, according to a NITI Aayog report, 'With the climate change manifested in the form of rising temperatures, rise in rainfall intensity, reduction in its temporal spread and a marked decline in winter rain, the problem of dying springs is being increasingly felt across the Indian Himalayan region'. This spells doom to the north-eastern states as the water needs are predominantly met from springs—about 37% in Arunachal Pradesh; 45% in Nagaland; 55% in Manipur, Meghalaya, and Mizoram; and 94% in Sikkim. The climate projections clearly indicate the need for improved flood management strategies for effective adaptation. It is only through the integration of climate risk information into programmes and policies that the north-eastern states can buffer losses and be prepared for increasingly intense and frequent extreme events in the future.

The full report is available **here**.

For more details and interviews, please write to us at cpe@cstep.in

About CSTEP: The Center for Study of Science, Technology and Policy (CSTEP) is one of India's leading think tanks, involved in solving Grand Challenges that the country faces. These include a Sustainable and Secure Future, India's Green Energy Transition, Clean Air for All, and Digital Transformation.