

# Europe forest loss cloud on monsoon

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**New Delhi, March 3:** The loss of forestland in Europe or Russia is likely to push major rain-bearing cloud bands near the equator southward and weaken the Indian monsoon more than deforestation within the country, a team of climate scientists has said.

The scientists at the Indian Institute of Science, Bangalore, have shown through a computer simulation that the remote effects of large-scale deforestation in the middle and upper latitudes of the northern hemisphere have stronger negative impacts on rainfall than local deforestation.

"This is a really big surprise, because this is exactly the opposite of how deforestation effects the temperature — where local effects dominate," Govindasamy Bala, an associate professor at the Centre for Atmospheric and Oceanic Sciences at the IISc, told **The Telegraph**.

Scientists have known for long that the loss of forests can increase the amount of carbon dioxide in the atmosphere

as trees absorb this gas. But several studies in the past have also shown that the forest loss can also reduce the amount of water vapour and change the reflectivity of the land.

Bala and research scholars N. Devaraju and Angshuman Modak set out to investigate what they say are the biogeophysical effects of large-scale forest loss on rainfall patterns across the world. Most previous studies of climate change have not taken into account these effects of deforestation.

Using a global climate simulation model, the scientists removed forestland bit by bit on their computer and observed whether and how the rainfall would change. They found that large-scale deforestation will shift a key rainfall-making mechanism that scientists call the inter-tropical convergence zone (ITCZ) southward, implying less rainfall in the main monsoon regions of the northern hemisphere such as India, East Asia, North Africa, and North America.

"This southward movement of the ITCZ is greater for deforestation in the middle and upper latitudes than for

deforestation within India," Bala said. A research paper describing their simulation was published in the *Proceedings of the National Academy of Sciences* yesterday.

The ITCZ is a tropical rain-bearing cloud band where moisture in the atmosphere converges to generate rain.

In one simulation scenario where the scientists "turned" virtually all forests across middle and upper latitudes into grasslands, the South Asian Monsoon was the most negatively effected, with an 18 per cent decline in annual rainfall over India.

While the remote effects of deforestation on the Indian monsoon are stronger than local effects, the scientists caution that this finding should not be interpreted to justify the diversion of forestland within India.

The researchers say their findings imply that future assessments of the likely impacts of deforestation should take into account not just the effects on carbon dioxide in the atmosphere, but also these biogeophysical effects that the loss of forests would have on different regions of the world.