Why a new study claims logged tropical forests can emit carbon into the atmosphere

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A new study has found that tropical forests, which have been logged (cut down) or degraded, remain a source of carbon emission for at least a decade. The findings are contrary to a previous assumption – that recovering tropical forests absorb more carbon than they emit into the atmosphere because they witness rapid re-growth of trees.

The study compared data collected from both intact and logged forests and concluded that the latter release a substantial amount of carbon from its damaged soil and decaying deadwood.

Researchers Maria B. Mills (University of Leicester), Terhi Riutta (University of Oxford), Yadvinder Malhi, (University of Oxford) and others from the UK, Malaysia, Peru and Australia authored the latest study, 'Tropical forests post-logging are a persistent net carbon source to the atmosphere', **published in Proceedings of the National Academy of Sciences.**

"Our data directly contradict the default assumption that recovering logged and degraded tropical forests are net carbon sinks, implying the amount of carbon being sequestered across the world's tropical forests may be considerably lower than currently estimated," the researchers wrote in the paper.

What is carbon sequestration and how do forests play a role in it?

Carbon sequestration is a crucial part of the global carbon cycle, as it is the process of capturing and storing atmospheric carbon dioxide. One of the ways this happens is when forests and other land vegetation absorb carbon dioxide during photosynthesis.

According to a 2014 NASA-led study, tropical forests remove up to 30 per cent of human carbon dioxide emissions from the atmosphere and make for an important carbon sink — an area which absorbs more carbon than releases it. Therefore, they have a significant role in keeping global temperatures low.

What makes this study's findings different?

Many of the previous studies on recovering tropical forests estimated the amount of carbon being absorbed by them by only focusing on the regrowing of the trees.

"This means they are only measuring the sink function of the forest. If you imagine your bank account – it would be like only looking at your incomings, not your outgoings," says Terhi Riutta, one of the authors of the study and a researcher with the University of Oxford, while talking to *The Indian Express*.

Unlike their predecessors, Riutta and her team also looked into how much carbon was released from the ground, meaning from soil and deadwood, to calculate the overall carbon budget of the logged and unlogged forests.

Their study was conducted in the forests of Malaysian Borneo, which is a hotspot of deforestation and forest degradation. The region has a vast expanse of logged forests as well as old-growth protected forests, providing "a great logging gradient to study."

To estimate the carbon of the area, the researchers used a handheld infrared gas analyser monitor to test patches of ground and pieces of deadwood. They also set up a 52 metres-high tower, which measured the 'flux' of carbon into and out of the forest.

What are the findings of the study?

The study observed that while intact or unlogged forests are generally carbon-neutral (they release and absorb roughly the same amount of carbon), logged or degraded forests remain a "net source of carbon" for up to a decade. This happens because such forests tend to have damaged soil and large deadwood stocks, originating from abandoned logs and collateral damage during logging. Soil and deadwood naturally release carbon when they decay.

The researchers also point out that although their study is focused on only one particular area, “the potential implications are serious” as the tropical forest carbon sink may be much smaller than previously estimated, if recovering forests are a net carbon source.

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