

# Alarm as study reveals world's tropical forests are huge carbon emission source

Forests globally are so degraded that instead of absorbing emissions they now release more carbon annually than all the traffic in the US, say researchers



The study measured the impact of disturbance and degradation – the thinning of tree density and the culling of biodiversity below an apparently protected canopy. Photograph: AFP/Getty Images

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The world's tropical forests are so degraded they have become a source rather than a sink of carbon emissions, according to a new study that highlights the urgent need to protect and restore the Amazon and similar regions.

Researchers found that forest areas in South America, Africa and Asia – which have until recently played a key role in absorbing greenhouse gases – are now releasing 425

teragrams of carbon annually, which is more than all the traffic in the United States.

This is a far greater loss than previously thought and carries extra force because the data emerges from the most detailed examination of the topic ever undertaken. The authors say their findings - published in the journal *Science* on Thursday - should galvanise policymakers to take remedial action.

"This shows that we can't just sit back. The forest is not doing what we thought it was doing," said Alessandro Baccini, who is one of the leader authors of the research team from Woods Hole Research Center and Boston University. "As always, trees are removing carbon from the atmosphere, but the volume of the forest is no longer enough to compensate for the losses. The region is not a sink any more."

The study went further than any of its predecessors in measuring the impact of disturbance and degradation - the thinning of tree density and the culling of biodiversity below an apparently protected canopy - usually as a result of selective logging, fire, drought and hunting.

This can reduce biomass by up to 75%. But it is more difficult for satellites to monitor than deforestation (the total clearance of foliage) because, when viewed from above, the canopy appears uninterrupted despite the depletion underneath.

To get more accurate data, scientists combined 12 years of satellite data with field studies. They found a net carbon loss on every continent. Latin America - home to the Amazon, the world's biggest forest - accounted for nearly 60% of the emissions, while 24% came from Africa and 16% from Asia.

Overall, more carbon was lost to degradation and disturbance than deforestation. The researchers stressed this was an opportunity as well as a concern because it was now possible to identify which areas are being affected and to restore forests before they disappeared completely.

"Prior to this we knew degradation was a problem but we didn't know where or how much," said Wayne Walker, another of the lead authors. "It's easier to address the problem when there is still some of the forest left standing."

The priority is to protect pristine forests with high carbon density. The most effective way of doing this, he said, was to support land rights for indigenous people. "Those living in the forest can make a difference," Walker said.

Unfortunately, many governments whose territories are home to tropical forests are moving in the opposite direction. In Brazil and Colombia, for example, deforestation has accelerated rapidly in the past year.

"When I look at these numbers and the map of where the changes are occurring, it's shocking," said Baccini, who has a two-year-old son. "My child may not see many of the

forests. At this rate of change, they will not be there.”

But he said the numbers should be a driver for action. “We need to be positive. Let’s turn tropical forests back into a sink. We need to restore degraded areas” he said. “As far as technology for reducing carbon is concerned, this is low-hanging fruit. We know how to protect and sustain forests. It’s relatively cost effective”

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