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REPORT

Active restoration accelerates the carbon recovery of human-modified tropical forests

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The carbon gain in restored logged forest

There is currently great interest in the capacity of global forest to store carbon and hence contribute to the mitigation of climate change in the coming decades. In a study of Southeast Asian tropical forest, Philipson *et al.* show that active restoration of logged forests generates higher rates of carbon accumulation than naturally regenerating forest. To estimate the economic feasibility of restoration treatments, they modeled the carbon price required to offset the cost of restoration, finding that the highest prices seen in recent years would be needed to approach those that could offset restoration costs. These results are important for tropical forest policy, establishing the importance of restoration for the carbon recovery potential of tropical forests.

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Abstract

More than half of all tropical forests are degraded by human impacts, leaving them threatened with conversion to agricultural plantations and risking substantial biodiversity and carbon losses. Restoration could accelerate recovery of aboveground carbon density (ACD), but adoption of restoration is constrained by cost and uncertainties over effectiveness. We report a long-term comparison of ACD recovery rates between naturally regenerating and actively restored logged tropical forests. Restoration enhanced decadal ACD recovery by more than 50%, from 2.9 to 4.4 megagrams per hectare per year. This magnitude of response, coupled with modal values of restoration costs globally, would require higher carbon prices to justify investment in restoration. However, carbon prices required to fulfill the 2016 Paris climate agreement [$40 to $80 (USD) per tonne carbon dioxide equivalent] would provide an economic justification for tropical forest restoration.