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Spatial patterns of carbon, biodiversity, deforestation threat, and REDD+ projects in Indonesia

Resource
January 2015

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Summary

There are concerns that Reduced Emissions from Deforestation and forest Degradation (REDD+) may fail to deliver potential biodiversity co-benefits if it is focused on high carbon areas. The authors of this paper explored the spatial overlaps between carbon stocks, biodiversity, projected deforestation threats, and the location of REDD+ projects in Indonesia, a tropical country at the forefront of REDD+ development. For biodiversity, they assembled data on the distribution of terrestrial vertebrates (ranges of amphibians, mammals, birds, reptiles) and plants (species distribution models for 8 families). They then investigated congruence between different measures of biodiversity richness and carbon stocks at the national and sub-national scales. Finally, they mapped active REDD+ projects and investigated the carbon density and potential biodiversity richness and modeled deforestation pressures within these forests relative to protected areas and unprotected forests.

There was little internal overlap among the different hotspots (richest 10% of cells) of species richness. There was also no consistent spatial congruence between carbon stocks and the

biodiversity measures: a weak negative correlation at the national scale masked highly variable and nonlinear relationships island by island. Current REDD+ projects were preferentially located in areas with higher total species richness and threatened species richness but lower carbon densities than protected areas and unprotected forests. Although a quarter of the total area of these REDD+ projects is under relatively high deforestation pressure, the majority of the REDD+ area is not. In Indonesia at least, first-generation REDD+ projects are located where they are likely to deliver biodiversity benefits. However, if REDD+ is to deliver additional gains for climate and biodiversity, projects will need to focus on forests with the highest threat to deforestation, which will have cost implications for future REDD+ implementation.

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