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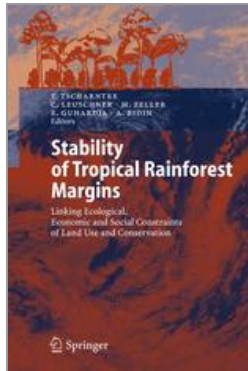
Stability of Tropical Rainforest Margins

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Economic evaluation of ecosystem services as a basis for stabilizing rainforest margins? The example of pollination services and pest management in coffee landscapes

Abstract

The determination and evaluation of ecosystem services provides crucial information for a comprehensive strategy to preserve near natural habitats such as rainforest margins. We show results of an economic evaluation of coffee bee pollination services and pest control in two distinct tropical regions: a low human-impact area in Indonesia with continuous near natural forests neighboring agroforestry and a high-impact landscape in Ecuador with almost no forest fragments left. We evaluate bee pollination services comparing forest destruction scenarios, where coffee yields depend on forests providing nesting sites and foraging habitats for bees and present three novel approaches: first, we show how net coffee revenues depend on pollination services of adjacent forests considering berry weight in addition to fruit set, thereby providing a more comprehensive evaluation. Second, we combine our findings on pollination with an assessment of pest management affecting coffee production. Third, we determine net welfare effects of land-use changes including the fact that former forestland is normally used for alternative crops. In both regions, crop revenues exceed coffee pollination values, generating incentives to convert forest margins even if owners would be compensated for pollination services. The promotion of certified “biodiversity-friendly” coffee is a feasible option to maintain shade-coffee systems for conservation purposes. This is of special importance in high-impact areas where only small forest fragments remain. We conclude that a comprehensive economic analysis is necessary to adequately evaluate rainforest preservation for the enhancement of ecosystem services within a mosaic of competing land-use systems.



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