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# Land-Use Intensity and Ecosystems Stability

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## Abstract

Land-use intensification is greatly reducing species richness and functional diversity (Flynn et al., 2009). Nonetheless, the relationship between biodiversity and ecosystem services supply is highly context dependent and influenced by the potential trade-offs among services (Maes et al., 2012), in particular modern crop production and regulation services. Through an ecological network model, we address the relationship between ecosystem's complexity, stability and productivity and how it is affected by land-use intensity, measured as the removal of biomass through harvest. We test different harvest intensities and distributions among species in order to assess the impact of land-use intensity in the ecosystem's stability, as both local stability and biomass variability, as well as in the proportion of species extinctions. We found that land-use intensity triggers a decrease in both metrics of ecosystem's stability, while also leading to an high proportion of species extinctions. In this context, our results support the hypothesis that a biomimetic harvest configuration, implying low harvest rates distributed among several producer's species, could mitigate these impacts while also enhancing ecosystems productivity and the yields obtained.

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