

Patterns of ecosystem services supply across farm properties: implications for ecosystem services-based policy incentives

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Abstract

In developing countries, the protection of biodiversity and ecosystem services (ES) rests on the hands of millions of small landowners that coexist with large properties, in a reality of highly unequal land distribution. Guiding the effective allocation of ES-based incentives in such contexts requires researchers and practitioners to tackle a largely overlooked question: for a given targeted area, will single large farms or several small ones provide the most ES supply? The answer to this question has important implications for conservation planning and rural development alike, which transcend efficiency to involve equity issues. We address this question by proposing and testing ES supply-area relations (ESSARs) around three basic hypothesized models, characterized by constant (model 1), increasing (model 2), and decreasing increments (model 3) of ES supply per unit of area or ES “productivity”. Data to explore ESSARs came from 3384 private landholdings located in southern Chile ranging from 0.5 ha to over 30,000 ha and indicators of four ES (forage, timber, recreation opportunities, and water supply). Forage provision best fit model 3, which suggests that targeting several small farms to provide this ES should be a preferred choice, as compared to a single large farm. Timber provision best fit model 2, suggesting that in this case targeting a single large farm would be a more effective choice. Recreation opportunities best fit model 1, which indicates that several small or a single large farm of a comparable size would be equally effective in delivering this ES. Water provision fit model 1 or model 2 depending on the study site. The results corroborate that ES provision is not independent from property area and therefore understanding ESSARs is a necessary condition for setting conservation incentives that are both efficient (deliver the highest conservation outcome at the least cost) and fair for landowners.

Keyword

Equity | | Market incentives | | Agri-environmental schemes | | Farm productivity | | Conservation policy