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# A Revealed Preference Approach to Estimating Supply Curves for Ecosystem Services: Use of Auctions to Set Payments for Soil Erosion Control in Indonesia

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## Keywords:

conservation auction; conservation planning; payments for ecosystem services; poverty alleviation; *curvas de suministro; diseño de programa; disminución de pobreza; pagos por servicios del ecosistema; conservación*

**Abstract:** *To supply ecosystem services, private landholders incur costs. Knowledge of these costs is critical for the design of conservation-payment programs. Estimating these costs accurately is difficult because the minimum acceptable payment to a potential supplier is private information. We describe how an auction of payment contracts can be designed to elicit this information during the design phase of a conservation-payment program. With an estimate of the ecosystem-service supply curve from a pilot auction, conservation planners can explore the financial, ecological, and socioeconomic consequences of alternative scaled-up programs. We demonstrate the potential of our approach in Indonesia, where soil erosion on coffee farms generates downstream ecological and economic costs. Bid data from a small-scale, uniform-price auction for soil-conservation contracts allowed estimates of the costs of a scaled-up program, the gain from integrating biophysical and economic data to target contracts, and the trade-offs between poverty alleviation and supply of ecosystem services. Our study illustrates an auction-based approach to revealing private information about the costs of supplying ecosystem services. Such information can improve the design of programs devised to protect and enhance ecosystem services.*

**Resumen:** *Para proporcionar servicios del ecosistema, los propietarios de tierras incurren en costos. El conocimiento de estos costos es crítico para el diseño de programas de pago por conservar. La estimación precisa de estos costos es difícil porque el pago mínimo aceptable a un proveedor potencial es información privada. Describimos cómo se puede diseñar una subasta de contratos de pago para recabar esta información durante la fase de diseño de un programa de pago por conservar. Con una estimación de la curva de suministro de servicios del ecosistema, los planificadores pueden explorar las consecuencias financieras, ecológicas y socioeconómicas de programas alternativos. Demostramos el potencial de nuestro método en Indonesia, donde la erosión de suelo en fincas cafetaleras genera costos ecológicos y económicos aguas abajo. Datos de oferta de una subasta, de precio uniforme y pequeña escala, de contratos de conservación permitieron estimar los costos de un programa ampliado, la ganancia por integrar datos biofísicos y económicos a los contratos y los pros y contras entre la disminución de pobreza y el suministro de servicios del ecosistema. Nuestro estudio ilustra un método basado en subasta para revelar información privada sobre los costos del suministro de servicios del ecosistema. Tal información puede mejorar el diseño de programas diseñados para proteger e incrementar los servicios del ecosistema.*

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