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Insight

Enrichment Planting in Secondary Forests: a Promising Clean Development Mechanism to Increase Terrestrial Carbon Sinks

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ABSTRACT. With the increasing need to reduce greenhouse gas concentrations, afforestation and reforestation (A/R) projects are being implemented under the Kyoto Clean Development Mechanism (CDM) and under the voluntary carbon (C) market. The specific objective of A/R C projects is to enhance terrestrial sinks. They could also provide low-income communities in developing countries with a source of revenue, as well as a number of ecological and social services. However, feasibility issues have hindered implementation of A/R CDMs. We propose enrichment planting (EP) in old fallow using high-value native timber species as a land-use alternative and a small-scale C projects opportunity. We present EP in the context of ongoing work in a poor indigenous community in eastern Panama. We consider economic risks and advantages and concordance with existing modalities under the compliance market. The potential storage capacity for EP at the site of our study was $\sim 113 \text{ Mg C ha}^{-1}$, which is comparable to other land uses with high C storage, such as industrial teak plantations and primary forest. Because secondary forests show high aboveground biomass production, C projects using EP could harness large amounts of atmospheric C while improving diversity. Carbon projects using EP can also provide high levels of social, cultural, and ecological services by planting native tree species of traditional importance to local communities and preserving most of the secondary forest's ecological attributes. Therefore, EP planting could be considered as a way to promote synergies between two UN Conventions: climate change and biodiversity.

SÍNTESIS

Con la necesidad apremiante de reducción de los gases de efecto invernadero, proyectos de aforestación y reforestación (A/R) pueden implementarse bajo el Mecanismo de Desarrollo Limpio del Protocolo de Kyoto (MDL) o en el contexto del mercado voluntario. El objetivo específico de los mercados de carbono, voluntario o de compromiso, es de estimular el almacenamiento de carbono terrestre. Además, los proyectos de carbono podrían presentar una oportunidad para cambiar prácticas de uso de la tierra y proteger la biodiversidad mientras se provee un ingreso a las comunidades de países en desarrollo para mantener servicios ambientales. Proponemos un enriquecimiento de plantación cubierta (EP) en rastrojos o bosques secundarios utilizando especies de maderas nativas preciosas como alternativa forestal y proyecto de carbono a pequeña escala. Los diferentes aspectos de implementación del A/R-MDL actual están tomados en cuenta. Discutimos la EP en el contexto de investigaciones continuas en la comunidad indígena Ipetí-Emberá en Panamá-Este. En nuestro sitio, el potencia de almacenamiento de carbono para la EP podría ser de 113 Mg C ha^{-1} , lo cual es comparable a otros usos del suelo como plantaciones de teca y bosque primario. Como los rastrojos presentan una alta producción de biomasa, proyectos de carbono con EP podría acumular cantidades grandes de carbono atmosférico mientras se proveen beneficios socio-económicos. Al mismo tiempo EP podría mantener la estructura ecológica del bosque secundario y la biodiversidad promoviendo sinergias entre dos convenios: el de Biodiversidad y el de cambios climáticos.

Key Words: *biodiversity; carbon sequestration; clean development mechanism; enrichment planting; indigenous communities; payments for environmental services; secondary forests*