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Land Cover Analysis and Afforestation Options for Mitigation of Climate Change in the Lowlands of Bolivia

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Abstract

Land use in South and Central America is still very dynamic. While in many regions deforestation is ongoing, in others the abandonment of pasture land is prevailing. Conversion of these lands into forests may have a series of beneficial effects, for the natural resources (such as water, soil, biodiversity), but also from a socio-economic point of view. Potential income from carbon sequestration may serve as an additional stimulus for land owners to systematically convert those lands into forest.

The present study focuses on an evaluation of the overall potential of afforestation projects for carbon sequestration, in the Region of *Buena Vista* in Bolivia.

Satellite image analysis was carried out in order to locate best sites for carbon sequestration. Land use analysis revealed that the area suitable for conversion of pastures into plantations was about 9,800 ha. Plantations of Serebo (*Schizolobium amazonicum*) were considered and biomass estimations taken in 10 plantations of different ages.

With that information, a cost benefit analysis was performed to identify the conditions under which landowners may change their pasture lands into plantations, benefiting from future payment for carbon sequestration. In order to calculate opportunity costs, the net present values of two land uses were compared (cattle ranching and forest plantations).

The study shows that, in the absence payment for carbon sequestration, plantations of Serebo are not competitive compared to cattle ranching. Assuming a forest stand that produces both timber and carbon, the net income of a plantation of Serebo is higher than the net income from cattle ranching in the region.

Keywords: Biomass, carbon sequestration, cost-benefit analysis, land cover analysis