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"Development on the margin"

Monitoring Conservation and Livelihoods: Assessing REDD Effectiveness in the Juma Reserve, Amazonas, Brazil

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Abstract

The 589 km^2 Juma Sustainable Development Reserve is one of the first certified initiatives of Reducing Emissions from Deforestation and Degradation (REDD+) in the Brazilian Amazon created by the Amazonas Sustainable Foundation (FAS). The benefits expected from the project are mainly divided in 4 programs: Strengthening of environmental monitoring and control; Income Generation through the Promotion of Sustainable Businesses; Community Development, Scientific Research and Education; and Payments for Environmental Services (PES), through the "Bolsa Floresta" Program. Apart from social and environmental co-benefits the project aims at avoiding roughly 190 Mt of CO_2 emissions in 40 years. This study assesses the initial conservation outcomes based on a comprehensive remote sensing analysis, and complements findings with results from representative farm-household and village-level survey data.

Land use of small-scale subsistence farmers was recorded via GPS and field interviews in. Beneficial and adverse effects of REDD actions on livelihoods were noted, as well as changes in land use practice. The various components of the benefits from the REDD initiative were rated by the local population in terms of importance for household's land-use decisions, due participatory workshops conducted by FAS. Five years of satellite images were processed to create a multitemporal forest cover map featuring areas of change.

A supervised approach for forest cover map classification with a Support Vector Machine trained by field data proved superior to regularly used unsupervised approaches of PRODES and CLASlite. Deforestation in the study area declined with continuing REDD+ implementation, and support to the project remained high. In qualitative interviews farmers highlighted improved tenure security and quality of education, apart from PES, as important explanatory factors.

Observed land-use change as well as future deforestation models suggest strongest deforestation pressure outside the reserve by cattle ranchers coming from the south. High resolution images can be used for up-to-date monitoring of remote areas for timely fact-finding missions. Stronger field presence of environmental enforcement authorities seems beneficial from a monitoring perspective. FAS has been making partnerships with government agencies and plans to establish more southern outposts and community schools.

Keywords: Conservation, livelihoods, monitoring, REDD, remote sensing

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