

Mitigation and adaptation perspectives in sustainable land reform settlements in the Northwest of Mato Grosso, Brazil

Agrarian reform beneficiaries at the tropical forest fringe in the Brazilian Amazon are vulnerable to both environmental and economic stresses that have led them to unsustainable land uses. Environmental stresses have arisen from unusually dry conditions in the Amazon region that may presage global climate change. Price instability and infrastructure deterioration threaten the viability of commodity production, while pasture conversion of native forests and livestock production emerge as the next best option to survive at the frontier. Our study shows how settlers have resisted pressures toward destructive land use by registering collective property rights over common forestlands to comply with environmental legislation, while at the same time managing these forests for non-timber products. Channeled toward more remunerative markets and institutional uses in regional school lunch programs with government regulated minimum pricing has brought the value of Brazil nuts and other forest products and services higher, providing greater returns to farmers.

Abstract

There are a number of features of climate mitigation and adaptation strategies that suggest different pathways toward implementation in specific contexts. In the case of efforts to reduce carbon emissions from deforestation and degradation of forests (REDD), policy instruments that promote land use intensification and provide compensation for avoided deforestation are needed. In contrast, more long-term adjustments in agricultural production, and increased diversity of products may be more appropriate remedies to ensure greater resilience to global warming by farmers at the forest fringe. The integration of policy mechanisms to ensure both immediate mitigation and long-term adaptation to climate change must mesh technical options with capacity of social actors to absorb the imperatives of change.

Our studies accompany settlers at the Amazon frontier in northwest Mato Grosso, Brazil. Settlement was induced in this region in the 1970s as a means to siphon off the rural population expelled from mechanized crop production in southern Brazil. Farmers were able to purchase lots considerably larger than their previous properties, but they were not provided with orientation to the complexities of production in tropical biomes on infertile acid soils. Crop choice was restricted by the absence of market infrastructure. Many failed and became urban workers in the regional timber industry, or soon converted their forested lots to extensive pastures for beef cattle. At that time, they were urged to deforest up to half of their lands as a signature of property rights and a symbol of "productivity". But later, in the 1980s and 90s, global concern for the climate and biodiversity impacts of massive deforestation in the tropics led government to restrict land use requirements to allow only 20% of forests to be removed. More recent debate between agribusiness and environmental interests led to relaxation of these demands, and a search for more forest-compatible production and land use regulation approaches.

Brazil's commitments to reduce deforestation and forest degradation in line with the UNFCCC are significant, calling for an 80% reduction in deforestation in the Amazon biome by 2020.

These commitments were in fact largely met by 2010 through enforcement of command and control rules restricting Amazon land use. But little attention has been paid to the impact of climate changes that are anticipated even with successful mitigation underway. We suggest that agro-environmental measures adopted in successful local projects to promote sustainable forest and land use strategies may represent one part of an integrated mitigation and adaptation strategy to meet the goals of Brazil's national climate control plan in line with the UNFCCC.

We compare two settlements in neighboring municipalities in Northwest Mato Grosso. Both settlements established collective forest reserves to meet environmental codes. But in one case, the Vale do Amanhecer (VA) project was able to diversify agroforestry production and nontimber forest production in the common area and neighboring forest estates for a range of market channels, increasing incomes and improving employment opportunities for rural women. More remunerative markets and institutional uses in regional school lunch programs with government regulated minimum pricing has brought the value of Brazil nuts and other forest products and services higher, providing greater returns to farmers. This was accompanied by a slowing in deforestation on individual lots and a gradual shift away from extensive beef cattle raising. In contrast, the Juruena (JU) settlement project exhibited higher rates of deforestation and a failure to adapt land use systems or make productive use of common forestlands. We trace those features which enabled settlers in VA to develop a more resilient set of economic and land use options than those in JU, chiefly related to exposure to capacity building and successive investments in technical assistance and cooperative management over a 15-year period.

In conclusion we discuss the relationship between such local contrasts and the need to adopt a mix of policies that enable forest dwellers to chart a course through the maze of regulatory demands, commodity cycles and market opportunities while also contributing to efforts to reduce the impacts of global warming.