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What Role Can Carbon Payments Play in Poverty Alleviation? Analysis of a Forestry Carbon Project in Mozambique

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Abstract

In climate change policy, forestry carbon sequestration has emerged as a potential mitigation strategy. While implementation of land use, land use change and forestry (LULUCF) projects into the framework of the Kyoto Protocol is still underway, a market for voluntary emission reductions (VERs) has evolved. Though generally VER-producing projects try to combine carbon sequestration with rural, sustainable development objectives, relatively little research exists on possible trade-offs between these two policy goals. This paper undertakes a cost-benefit analysis of the financial incentives in a forestry carbon projects in Mozambique. The Net Present Values (NPVs) of seven, different eligible land-use systems are calculated. While some systems focus on carbon sequestration, others combine sequestration with the cultivation of cash crops. The results show that, compared with the potential income from cash crop sales, the income generated by carbon sequestration during the early years of the project is relatively small. For all but one option, the benefits do not outweigh the costs over the first nine years, resulting in negative NPVs over this time horizon. Over 15 years, systems combining sequestration and fruit production produce high potential returns, while land-use systems based on carbon sequestration alone are hardly viable. This is particularly true for the environmentally most favourable reforestation system. Thus, the predicted trade-off can also be seen at a project-scale. Regarding payments' role in poverty alleviation, they do contribute significantly to cash income, but are too little in magnitude to substitute income from other land-uses. Nevertheless, they might play a key role by enabling smallholders to afford the investment costs of agricultural income sources. During the early years, additional non-financial incentives are important to turn the NPVs into a positive range. In the long-run, a major task for project developers will be to create land-use systems that combine both carbon sequestration and other products on the same plots, which are attractive for smallholders while ensuring permanence of carbon storage.

Keywords: Carbon sequestration, climate change mitigation, cost-benefit analysis, forestry carbon project, Mozambique, poverty alleviation, trade-off, voluntary emission reductions