Peru

Agroforestry systems as CER providers: an analysis for the Peruvian Amazon region

A Policy Brief

An output of the CDKN funded project on modelling the socio-economic implications of mitigation actions in developing countries

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EXECUTIVE SUMMARY

Almost half of all Peru's greenhouse gas emissions come from forestry, and other land use or land use changes. These activities also contribute significantly to the country's economic growth and development.

Global efforts to encourage clean development in developing countries includes efforts to stimulate the preservation of existing forests, and rehabilitation of degraded ones or the reforestation of abandoned areas after a cropping period, through paying for the forests' carbon sequestration properties.

This policy brief considers the findings of a modelling process carried out by the Instituto de Investigación de la Amazonía Peruana (IIAP) team, which compares the economic value of timber felling practices in agroforestry plots in Peru, with the potential financial benefits of using global carbon trading mechanisms to compensate the country for projects which enable reforestation, afforestation, using agroforestry plantations. This could be done through small-scale re-forestation as agroforestry projects.

The modelling uses specific definitions for what constitutes an agroforestry plantation and analyses tree-felling data from the 1950s to calculate the carbon-banking potential of timber planted in agroforestry projects in the Peruvian amazon forests area.

The research also reflects the analysis of one such project in areas close to the Iquitos-Nauta road, in the northeast Peruvian Amazon, to demonstrate viability, context and potential challenges.

Findings show that if prices of the 'certified emissions reduction' units, or CERs, are low, it is only worthwhile to keep trees in such projects standing for 15 years. Thereafter, the income generated by these CERs would not compensate against the income lost from communities not being able to sell the timber products.

However if the global carbon stock market kept the value of CERs at 12 Euros per CER, as they were in 2010, it might be viable to preserve trees for 30 years. This would be enough incentive for regional and local government to invest in small scale agroforestry or forest plantation related projects.

INTRODUCTION

Globally, human activities linked to using land, land use change (such as clearing of forests to make way for agriculture) and forestry, produce 18% of greenhouse gas emissions. In Peru, these activities account for almost half of the country's emissions profile.

However forestry and agroforestry, and the financial benefits derived from selling timber and clearing land for agriculture, significantly contribute to the farmer´s and country's economy.

Peru could potentially benefit from using market mechanisms created by the Kyoto Protocol to help fund the country's forest conservation and land rehabilitation, while at the same time reducing related carbon emissions and increasing carbon sequestration.

Under the Kyoto Protocol's Clean Development Mechanism (CDM), developed world countries can meet a portion of their emissions reduction targets through buying 'certified emissions reduction' units (CERs) from developing countries. This is a way to reduce global emissions, while at the same time encouraging greener development in developing nations.

The current rules governing the CDM process relating to forestry only applies to rehabilitating degraded forests, or planting new forests in previously unforested areas. Peru has the potential to tap into this mechanism. Using small-scale forest plantation or agroforestry, projects aimed at rehabilitating existing degraded lands, managing forestry and agroforestry plantations sustainable could be funded by carbon trading mechanisms, thereby funding carbon banking through tree conservation using developed world money.

By integrating Kyoto Protocol carbon forestry projects as a part of other rural development projects it is possible for carbon capturing projects to bring positive benefits for both local people and the climate.

This policy brief considers the potential viability of such projects for communities living in the Peruvian Amazon. In order to do so, researchers need to:

- find the appropriate data and models to run various scenarios
- define what forests and agroforestry are in this context
- calculate the carbon-banking potential of these forests and agroforestry plantation
- model the potential financial returns of small scale forestry and agroforestry plantation projects when the CERs' value is low, and when it is high
- compare these potential returns with the 'opportunity costs', i.e. the lost revenue if current timber felling and related forestry activities are slowed, or agricultural expansion potential is lost as forests are conserved, this will impact on the economy in terms of lost revenue to timber sales and agricultural production.

APPROACHES AND RESULTS

To calculate the potential for Peruvian Amazon forest and agroforestry to be used as part of a CDM-funded mitigation project, it is necessary to define:

- what constitutes a 'forest' and if "agroforestry plantations" constitutes a forest and thereby establish what falls into the rules of the forestry related CDMs
- how much carbon the trees are able to absorb
- the possible returns based on low and high CER values

How 'bankable' is the Peruvian Amazon?

Tropical forests hold large volumes of carbon; however there is some uncertainty about how much this contributes to the global carbon cycle.

There are ways to calculate the above-ground biomass (AGB) of forests and agroforestry plantations, and thereby estimate how much carbon a forest can bank.

To estimate the carbon carrying capacity of forest and agroforestry plantation in Peru's Amazon area, researchers:

- worked on the premise that 1ha of tropical forest or agroforestry contains up to 300 tree species
- used tree harvesting records dating back to the 1950s, trees coming of out of tropical climate forests, where forests were categorized as either 'young' or 'old growth' forests
- calculated the carbon sequestering capacity of a tree based on its trunk diameter (since the records often did not contain information about tree height because it is very difficult to measure) and the wet weight of the timber (rather thank the dry weight)

What is a 'forest'?

Peru defines a forest as: a minimum tree crown cover of 30%, where the tree height is greater than 5m over at least half a hectare, this description is matched by an agroforestry plantation.

The current rules governing the CDM process relating to forestry only applies to rehabilitating degraded forests, or planting new forests in previously unforested areas. While it does not apply to the emissions reductions related to conserving existing natural forests, it does apply to agroforestry plantations.

Calculating the value of carbon trading 'currency', the CER

Once the IIAP researchers had quantified the 'above ground biomass' of Peru's forests and agroforestry plantation, and the likely carbon-storing capacity of that timber, they needed to then calculate a possible price for the 'certified emissions reduction' units (CERs). This allowed researchers to compare the possible future income receive by selling the wood in the market, which is an income obtained when the trees are not preserved and are felled.

Case study from Iquitos-Nauta, northeast Peruvian Amazon

A small-scale agroforestry project along the Iquitos-Nauta highway in the northeast Peruvian Amazon was designed to benefit 500 households who currently make a living from selling forestry and agricultural products. The project was structured in such a way that they would add to this income by selling CERs in the medium term. Money earned is handled at a household level, and the project is structured in a way that includes and builds women participation.

The farmer's plots close to the Iquitos-Nauta road are typical of the area:

1. A landscape divided into small landholdings occupied by subsistence farming households living well below the poverty line.
2. Slash and burn agriculture is increasingly unsustainable because of population pressure and the inherent infertility of the land to support sustained row crop agriculture.
3. With natural resource degradation there is continuous deforestation of the mature forest.

Drawing on a review of this project, researchers examined the legal and policy structures of the CDM and how this influences the project's ability to generate CERs while at the same time promoting sustainable development:

1. It shows that there are low carbon stocks in areas where mature forest had been removed, indicating a high potential for an increase in carbon storage through project activities.
2. The mean weighted carbon value in the above ground biomass of agroforestry plot is 130 tons of carbon per hectare.
3. Given that the forest inventories used in this study were collected at locations most accessible to Iquitos it is likely that the sampled forests had been selectively logged.
4. The principle source of income for subsistence farmers in the region is currently through the sale of agricultural produce.
5. Family incomes vary widely along with the price of produce in the market few households quantify 'annual' earnings or kept accounts, but rather live day to day.
6. Bottom line agriculture income for most farmers is minimal. With an average land holding of under 20ha, and in many case under 10ha.
7. Houses are of a very low income people, over-crowded, none have running water, or electricity and farmers have few belongings.
8. Farmers struggle to be economically sustainable economic because they lack a competitive advantage in the production and sale of agricultural produce as compared to riverside farming communities elsewhere in Loreto.

A 2008 analysis of the Iquitos-Nauta project concludes that selling CERs could generate over $1,000,000 in income for the community over 20 years once the 'transaction costs' (elaboration of the profiles and proposals, registering the project, certifying it) of all of the CDM aspects of the project are covered. Although this would not be able to fund the start-up and on-going maintenance costs for reforestation, such as nursery establishment, planting costs, training, infrastructure, pest and disease control, etc.

Another caution is that landowners would expect monthly or annual remuneration for keeping the trees on the land if they are to forego the income stream from other farming revenues.

CONCLUSIONS

Once researchers calculated the value of trading preserved trees on the carbon market, with the value that a community would gain from harvesting and selling the timber products from that agroforestry plantation, they were able to show the following:

- There will always be a trade-off between the income earned through carbon trading, and the income lost through not selling the harvested timber.
- If the CERs' value is low, it is only viable to preserve trees for 15 years; after that, keeping the trees standing translates into too much lost revenue from timber harvesting.
- If the CERs' value is as high as it was in 2010, namely, Euros 12 per CER, then it might be viable to preserve trees for 30 years.

This would be enough incentive for regional and local government to invest in small scale forest related projects.

NEXT STEPS

Next steps will be oriented towards introducing the basic concepts of agroforestry plantations as providers of CER among the Regional Forest Authorities, and introducing the theme in the agenda of discussions of the Regional Development Direction in order to promote the investment of funds from the oil company royalties for the establishment of agroforestry plantations.

It is necessary that the Regional Government from the Peruvian Amazon issue a Regional Order (Highest Law level for a region) that indicates the feasibility to use funds from the oil companies royalties for the promotion of agroforestry plantation and at the same time it is necessary that the Regional Government provide support to the farmers to elaborate their project for the carbon markets.

To access the working paper on which this brief is based, please see www.erc.uct.ac.za or email legna.razalas@gmail.com