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Carbon forestry in agricultural landscapes: ready for the competition?

From STEPS working paper 50, "Carbon Offsets and Agricultural Livelihoods: Lessons Learned From a Carbon Credit Project in The Transition Zone of Ghana" February 2015

STEPS Centre briefing

Carbon offset projects are an increasingly important approach to carbon mitigation under the REDD+ (Reducing Emissions by Forest Degradation and Deforestation) framework. But how does 'farming carbon' compete with other land uses? This briefing investigates this question through the experience of the Carbon Credit Project in Ghana.

The project required farmers to plant and maintain Cedrela[1] trees on their farmlands at a density of 100 trees/10,000 ft² over an agreed period of 20 years for carbon revenue of an uncertain amount. This briefing examines the pro-poor claims and local acceptance of the carbon offset project in the context of potential returns from alternative land uses (hybrid cocoa, chili pepper and maize farming), and provides policy recommendations for making REDD-type interventions pro-poor and acceptable in smallholder contexts.

Our analysis draws on case studies from two communities of contrasting land values: Dumasua (peri-urban) and Badu (rural). This contrast helps to show the differing implications of urbanization and land pressure on the future of smallholder agriculture within the framework of REDD+. Socially differentiated access to land, and how it affects grassroots actors' ability to join the project and derive benefits from it, are also factored into the discussion.

[1] A fast growing tree of a high carbon sequestration potential that is native to large areas of Central and South America

Photo: Cedrela trees planted with food crops for carbon sequestration

Carbon forestry: a pro-poor intervention?

Achieving carbon forestry in agricultural landscapes has been touted as a sustainable income generating venture and pro-poor policy intervention, especially in rural areas where the main source of livelihood is farming. But is this rhetoric really attuned to local realities? Some have raised concerns about the livelihood security of subsistence farmers as carbon competes with food crops for land, given that carbon payments may be too low to make up the possible shortfall in their food supply (IIED 2010). The question therefore remains whether forest carbon payments are really profitable.

Understanding the situation on the ground, and linking local realities to wider policies, is essential. This is why a detailed analysis of existing projects – even ones that have ostensibly failed – is needed to learn lessons for the future.

Why hybrid cocoa and chili pepper are accepted more than carbon

The carbon revenue of each tree was agreed between farmers and the Project Developer (Vision 2050 Forestry Ghana Limited) to be GH¢100 (£40) to be standard for a period of 20 years. Thus, carbon revenue of £4,000 was estimated to accrue from 100 trees planted on a 10,000 ft^2 (0.093 ha) parcel of land and this amount was considered to have potential to better the lives of the rural poor.

Landowners, however, did not regard the carbon project as pro-poor, given the high opportunity costs of farmland, increasing land values and inflation. For the project to be considered as profitable and pro-poor, landowners were of the view that the carbon revenue of trees per land unit must exceed income from highly profitable crops (Table 1 and Figure 1) and payment must be short-term.

	Investment	Estimated 20-year income (≈£)	Years to realizing benefits
1.	Carbon offset	4,400	20
2.	Hybrid cocoa	3,328	6
3.	Chili pepper	17,998	1
4.	Rain-fed maize	2103.36	¼ (i.e. 3 months)
5.	Improved maize	7,662.24	¼ (i.e. 3 months)

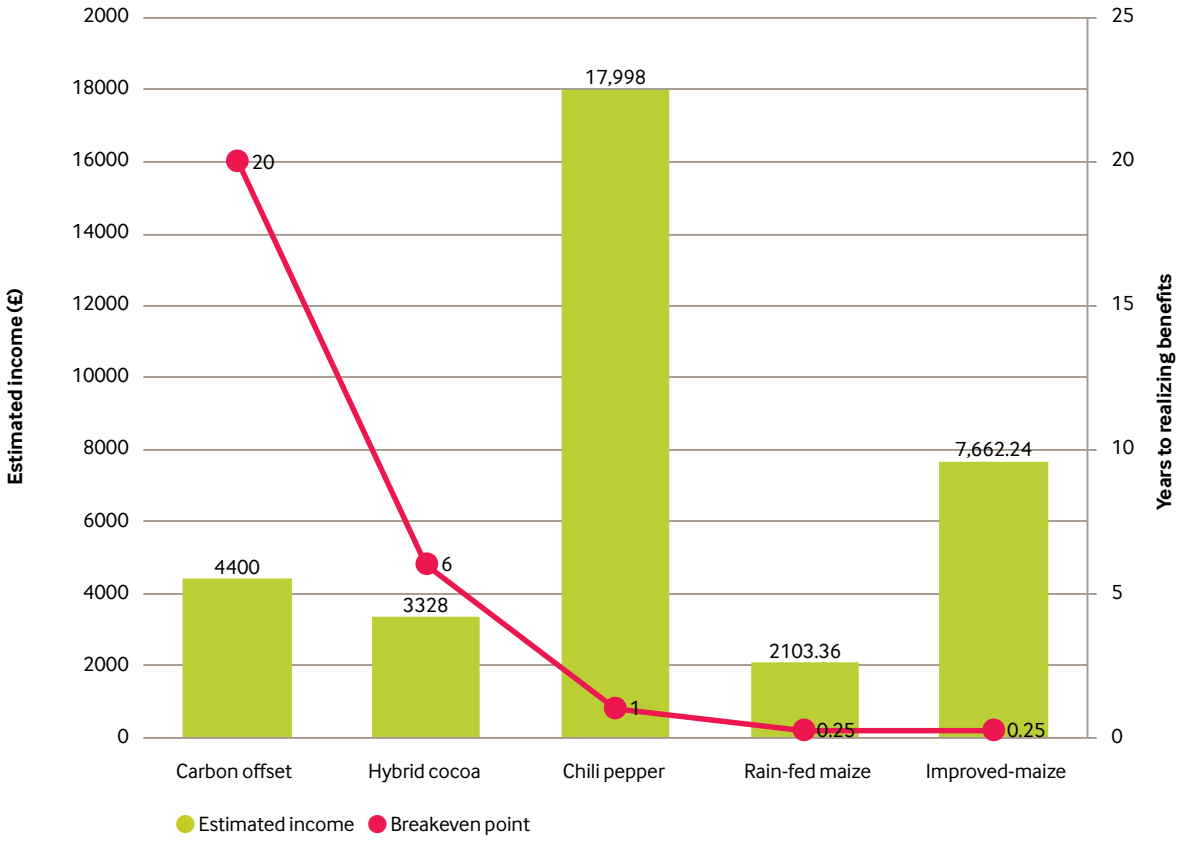
Table 1: Income and years to realizing benefits of carbon offset compared with hybrid cocoa, chili pepper and maize per 10,000 ft^2 (0.093 ha) land unit

Farmers in our two case study sites used different crops as benchmarks to compare revenues. In the peri-urban area (Dumasua), they used income from chili pepper as a benchmark for appraising the adequacy of carbon revenue, as they regarded chili pepper as the most profitable crop in recent times. Chili pepper is also regarded as the most socially acceptable crop for women to grow. In Badu (the rural area), farmers used income from cocoa as the yardstick for assessing carbon revenue of trees, because cocoa was a significant source of wealth in the transition zone prior to the 1983 bush fires, when the soil and climate were ideal for cocoa production.

It can be observed from Table 1 and Figure 1 that carbon revenue was more than twice the income from rain-fed maize but represented just a little more than half the income from improved maize. Since rain-fed production is the common practice, it implies most of the farmers were earning below the expected income from carbon when planting maize. This probably explains why maize was not used as the comparator even though it is the dominant crop.

[2]2012 exchange rate of£1≈GH¢2.5 was used throughout this briefing

Fig.1 Years to realizing benefits and Estimated 20 year Income from Carbon, Cocoa, Pepper and Maize Per 0.093 ha of Land



Estimated income from carbon offsets was, however, far below that of chili pepper, and the income difference is indeed expected to widen over the next 20 years, considering potential increases in the farm gate price of chili pepper and income from other crops grown when pepper is off-season. Although carbon revenue slightly exceeded projected income from hybrid cocoa, cocoa income could exceed carbon revenue if future rises in the producer price of cocoa and non-cocoa income from secondary products (fruits, timber and fuelwood) were taken into account over a 20-year period.

Short-term returns from hybrid cocoa also appealed, particularly to older male farmers, who form the majority of landowners in the area. Older landowners thought they had few years to live and therefore preferred short-term benefits. It is these short-term benefits of hybrid cocoa that have won it the accolade 'akokorabedi', translated from the Twi language as 'the old man shall live to enjoy it'. The competitive advantage of hybrid cocoa can further undermine prospects for carbon forestry, considering that hybrid cocoa performs best under direct sunlight, and this is already causing many farmers to remove shade trees from their farms in order to intensify production (Asare 2005).

None of the above comparisons include the most lucrative crop: marijuana. This is a popular, although illegal crop in Badu and nearby areas, particularly for younger farmers who had never experienced the cocoa boom. The relative returns are significantly more than carbon and probably exceeding pepper, although accurate data were not available.

With regard to the pattern of revenue flows, one farmer in Dumasua posed this rhetorical question: "What is the point in waiting for 20 years for carbon revenue when I can earn more from chili pepper within a short time"? An elderly farmer also remarked, "What is the guarantee that I will be alive in 20 years?" Even farmers who planned to leave their tree investments as legacies to their children were concerned about the long time frame for the carbon offset project. One of them said: "I also deserve to enjoy for a while, although I know my children will inherit my investment if I die too soon!"

The effect of land values and access

The attractiveness of carbon forestry in smallholder contexts is further influenced by the overall value of land. Land values were very different in the two study sites, with land being cheaper and more readily available in Badu (rural) as compared to Dumasua (peri-urban). Dumasua is close to Sunyani, the Regional Capital. The closeness and expansion of Sunyani was limiting availability of farmlands and increasing land prices dramatically, as farmlands were being converted into expensive building plots and intensive chicken production units. Thus, landowners in the peri-urban areas (Dumasua and nearby areas) were very concerned about wasting their lands on carbon offsetting, whereas those in the rural areas (Badu and nearby areas) were relatively satisfied on condition that carbon revenue will be fully paid as promised.

The pro-poor claims of carbon forestry were also undermined by inequities in land control and distribution, which determined how much smallholders were included in projects or could access benefits from them. Customary land inheritance systems generally gave men, older people and indigenous people better access to land and greater holding areas, enabling them to join the project and derive benefits more than women, young people or migrants.

Policy recommendations

In contrast to the simple narrative that carbon forestry will result in pro-poor gains, the situation on the ground is much more complex. The attractiveness of carbon forestry will depend on the potential returns from alternative uses of land. Gender, age and ethnic differences in land access are also important determinants of benefits in smallholder contexts.

The time frame of returns is also significant, with farmers emphasizing the importance of immediate, short-term returns in contrast to the long-term prospects promised under carbon forestry. Carbon offset schemes are designed to operate over a minimum of 20 years, and land values will change dramatically over this period, potentially undermining the incentives to maintain carbon trees, even in areas which have land surplus now.

The uptake of carbon forestry is therefore conditioned by a range of competing factors that influence whether impacts are 'pro-poor'. Despite the rhetoric, it remains debatable whether carbon forestry is up to the competition presented by alternative land uses.

To make forest carbon interventions competitive in smallholder contexts, it is essential for carbon revenues to exceed returns from highly lucrative crops. Payments have to be realizable on a short-term basis. This requires careful planning of carbon forestry projects, with a good understanding of competing land-uses and their returns, and how they are prioritized by different groups of people. Land reforms are also needed to address gender, age and ethnic inequalities in land access in order to enhance the inclusion of socially disadvantaged people.

Further reading
A longer and more detailed overview of the project and its impacts can be found at: steps-centre.org/publication/carbon-forests

The case study is featured in a new book: 'Carbon Conflicts and Forest Landscapes in Africa' (eds. Melissa Leach and Ian Scoones), Routledge, 2015

References
Asare, R. (2005) 'Cocoa Agroforests in West Africa. A Look at Activities on Preferred Trees in Farming Systems', Forest and Landscape Working Paper 6: 6-17, Copenhagen: Faculty of Life Sciences, University of Copenhagen

International Institute for Environment and Development - IIED (2010) 'Beyond forestry: why agriculture is key to the success of REDD+', IIED Briefing

About this briefing
This briefing was written by Ishmael Hashmiu and edited by Nathan Oxley.

This briefing emerged from the 'Political Ecologies of Carbon in Africa' project of the Social, Technological and Environmental Pathways to Sustainability (STEPS) Centre at the University of Sussex, UK (www.steps-centre.org). Further information on this project can be found at steps-centre.org/project/carbon.

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Contact
Tel: +44 (0)1273 915673
Email: steps-centre@ids.ac.uk
Web: www.steps-centre.org
Twitter: @stepscentre

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