Carbon offset methodologies, standards and monitoring

Key points:

- Carbon offset projects need to meet the requirements of approved methodologies, standards and monitoring systems in order for the trading of carbon credits to be allowed.
- There are significant barriers to the uptake of forestry and bioenergy carbon offset projects. These include: technical, cost and capacity barriers. Sufficient expertise and finance is necessary in order to overcome these barriers and to initiate and run carbon offset projects.
- Project monitoring for carbon can improve the sustainability of projects, by requiring project implementers to regularly evaluate how well technologies are working and being used.
- Project standards could be useful to improve the effectiveness and developmental benefits of the project. However, there may be cost-benefit tradeoffs in implementing these standards, and little is known about the effectiveness of such standards on actual project outcomes.

What are carbon offset methodologies?

A methodology defines all of the parameters and operations required for the calculation of emission reductions or removals from a carbon offset project during its lifetime. Project developers can either use pre-existing methodologies or develop new ones. For the CDM, any new methodology must be approved by the CDM Executive Board under the United Nations. This helps to ensure that all carbon offset projects globally conform to the same rules. Carbon offset methodologies consist of two main elements:

- **Baseline methodology:** A baseline methodology is the way to estimate the emissions or removals that would have occurred in the most plausible alternative scenario to the implementation of the project activity. The

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Box 1: Climate, community and biodiversity (CCB)

The CCB standard can be applied voluntarily to forestry or other land use based carbon offset projects. It outlines more stringent procedures for projects in terms of impacts on the climate (i.e. carbon measurement), impacts on communities and impacts on biodiversity. The standard consists of a detailed checklist of questions, for which evidence has to be provided by the project to demonstrate that it meets the standard. In terms of the 'community' aspects of the standard, requirements include:

- Demonstrating net positive community benefits
- Detailed analysis of offsite community impacts
- Community impact monitoring.

Implementing the standard incurs extra costs for projects, but it may allow for carbon to be sold at a premium price. The Kikonda forestry project in Uganda has been certified as a 'silver' rated CCB project. The unclear benefits of this project illustrate how offset standards can help to improve procedures, but may not necessarily improve outcomes (see 'Carbon offsets: researching opportunities for poor rural communities' for details of this project).

baseline methodology is important because it allows the emissions/removals with a project to be compared to those without the project in order to calculate the number of carbon credits that have been produced.

- Monitoring methodology: A monitoring methodology refers to the method used by the project to collect all relevant information necessary for the monitoring plan. This allows for the calculation of the project's emissions reductions or removals.

What are carbon offset standards?

Carbon offset standards set out all of the procedures that need to be followed to establish and run a carbon offset project. They include specifications of the methodologies to be used, but also specify how other processes should be handled, such as how governments should approve projects and how wider social and environmental concerns should be taken into account. The CDM itself is a carbon 'standard' because it sets out its own standard procedures for assuring the quality of projects. CDM standard procedures include:

- Requirements for key documents, such as a 'project design document' (PDD) and a letter of approval from the host country government for the project to go ahead.
- Procedures for approving methodologies at UN level.
- Specifications for who is accredited to verify the emissions reductions or removals have occurred.

There are also a number of independent standards operating in the carbon markets. These include:

- Comprehensive standards designed for the voluntary carbon markets that set out all of the requirements for establishing offset projects that can be certified to the standard. The main standard of this type is the Voluntary Carbon Standard (VCS), which resembles the CDM in many of its requirements.
- 'Premium' offset standards designed to be used in conjunction with comprehensive standards such as the CDM or VCS, but which increase the level of detail needed for implementation in certain areas. For example, the Gold Standard and the Climate, Community and Biodiversity Standard aim to enhance the wider social and environmental impacts of projects, by providing further guidance on how to assess and monitor these issues. This can help to increase the value of the credits sold in the carbon markets.

Monitoring

One of the differences between carbon offset bioenergy and forestry projects and more traditional approaches to such projects is the monitoring process. Research indicates that projects are often implemented with little follow-up monitoring to check whether the project is functioning (for example, if the biogas digesters are working properly or being used at all). Because carbon

Box 2: Impact of monitoring systems on the Kikonda Reforestation Project, Uganda

In the Kikonda project, the company claims that the introduction of carbon finance to the plantation has had some positive effects on the way it is managed. Better baseline assessments have been conducted and monitoring systems have been put in place. Submitting the project to the Climate, Community and Biodiversity (CCB) standard means that there has been more consideration of the impacts on local communities and systems to reduce negative impacts and increase benefits. A social survey was conducted early on in the establishment of the community group, Kicofa, which suggested some improvements to company interactions with the group, but few with the more negatively affected communities outside of the group.

credits are being sold in relation to these project activities, rigorous monitoring systems implemented over the lifetime of the project (normally greater than ten years) are required as part of the project methodology. Projects under the CDM have to prepare a monitoring plan which defines how data on emissions reductions will be collected and stored, and how calculations will be made to evaluate emissions periodically throughout the project.

Implications for 'pro-poor' projects

The requirements outlined above can impede the development of 'pro-poor' carbon offset projects because they introduce technical, cost and capacity barriers for project developers.

Technical barriers: The main technical barrier is that there are a limited number of methodologies that exist or have been approved for forestry and bioenergy carbon offset projects. For example, the CDM has only one approved methodology in the forestry sector, for afforestation and reforestation (A/R) projects. This is applicable to only certain kinds of A/R systems, which limits the coverage. Methodologies for certain types of solid fuel clean cook stove projects (which have been popular in rural development projects for many years) do not exist in the CDM, mainly due to methodological and measurement barriers. In the voluntary market, there are currently only around three projects globally that are being implemented. Similar issues have arisen for bioenergy projects. For example, even though clean cook stove projects have been promoted by many donors and governments over the last 30 years for their dual environmental and social benefits, the CDM does not have an approved methodology for such projects.

In general, methodologies for certain tree species or forestry systems are limited because of difficulties in measuring how much carbon different species and systems can sequester under different conditions and over time.

Table 1: Typical transaction costs with methodologies and project design (estimates from carbon transaction consultant)

Skills needed for engaging with carbon offset methodologies

- Science and technical knowledge
- Negotiation skills and contractual experience
- Implementation, monitoring and verification experience

Activity	Transaction costs
Feasibility Assessments	$5,000 - 20,000
Preparation of project design document	$25,000 - 40,000
Any necessary communication with local and/or national government	Unknown
Validation, verification and certification costs	$10,000 - 15,000
Executive Board administrative costs and registration fees, if a CDM project	$10,000

Some carbon offset standards have strong conservation objectives, which can impose further restrictions on the types of tree planting systems that can be implemented. For example, the Plan Vivo standard limits the planting of exotic tree species and requires indigenous trees or local varieties to be planted. From the perspective of small holder farmers, this may be restrictive if they are looking to maximise returns and reduce risks by being able to harvest sooner.

Another barrier in forestry CDM projects, is that the carbon credits are 'temporary', meaning that buyers need to re-purchase or replace them at regular intervals. They are temporary because there is a risk that carbon removed from the atmosphere by trees could be re-released if the trees burn or decay. Energy projects do not suffer from the same problem, so the credits from such projects are often more attractive to buyers than forestry credits.

Cost and capacity barriers: Another barrier to accessing the carbon offset market is the level of capacity and costs required for setting up the methodological, monitoring and standards requirements. High transaction costs associated with project monitoring procedures can be prohibitive for the development of projects (see table 1). Smaller scale projects, rural projects and forestry projects may have even higher transaction costs because of the large number of participants and difficult geographic locations. Carbon offset projects may suffer more than 'traditional' development projects, as they require a wider range of technical procedures and ongoing monitoring processes.

As there is a trend toward the establishment of more rigorous standards, these conditions could push up the cost associated with project development and verification. This is an area that the CDM is trying to address through the development of simplified methodologies for small-scale projects.

Further Resources:

UNFCCC CDM methodologies: Provides information related to baseline and monitoring methodologies for the different types of CDM project activities. http://cdm.unfccc.int/methodologies/index.html

Voluntary Carbon Standard: Methodologies used for the VCS. http://www.v-c-s.org/methodologies.html

The CarbonFix Standard methodology: http://www.carbonfix.info/chameleon//outbox/public/190/CFS_Methodology.pdf?PHPSESSID=q3fj6sisrqkmtsk1m8ts6ssfb4

Gold Standard: http://www.cdmgoldstandard.org/

Climate, Community and Biodiversity standards: http://www.climate-standards.org/

WinRock International: Leaders in developing methodologies and conducting assessments of forest carbon projects.
http://www.winrock.org/.
Winrock's guidebook on the implementation of CDM forestry projects. http://www.winrock.org/ecosystems/files/AR_CDM_Guide_BOOK.pdf

Project FORMA: Guidebook to markets and commercialisation of forestry CDM projects. http://www.proyectoforma.com/Documentos/GuidebooktoMarketsandCommercializationofCDMforestryProjects.pdf

Overseas Development Institute: http://www.odi.org.uk
Overview of social implications of carbon offset standards www.odi.org.uk/resources/download/11.pdf

RE-Impact: forest based bioenergy for sustainable development. Impact assessment frameworks for biofuels plantations