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How to maximize the performance of a VCS / CCBS native species reforestation project: findings from a case study in Colombia

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Introduction

Many forest carbon projects are currently in the process of attaining registration and securing verification of Verified Carbon Standard (VCS) carbon credits. However, the number of projects that are being successfully managed according to international standards is limited. The first forestry project in South America that completed VCS registration, issuance, Climate Community and Biodiversity Standard (CCBS) validation and verification was the Asorpar Project in Colombia. This paper summarizes lessons learnt from the Asorpar Project in Colombia (henceforth, CCN project). The authors hope that the information presented herein on the CCNP will maximize the probability of success of other forest carbon projects.

Image 01:
Baseline situation: illegal gold prospecting

Image 02:
Baseline situation: extensive cattle grazing on grasslands

The paper highlights issues that frequently arise during the VCS / CCBS-related work for a reforestation project. The CCN project (entitled "Restoration of degraded areas and reforestation in Cáceres and Cravo Norte, Colombia") serves as a positive case study. A summary of the CCN project is as follows:

The CCN reforestation project is located on 11,000 ha in northern Colombia in the provinces of Antioquia and Arauca. The project areas were previously exposed to extensive cattle grazing activities, and some parts of Antioquia were also negatively impacted by gold mining.

The project promotes sustainable management of forest resources in a manner that fosters natural regeneration. The polyculture project by Asorpar Ltd. and South Pole Carbon Asset Management Ltd. consists of planting 25 different native species adapted to soil conditions and selected according to local biodiversity and conservation needs. Emphasis is placed on promoting mixed-stand models that allow for natural regeneration and enhance tree diversity. Today, there are more than 100 tree species in the project area, as opposed to 25 species at the start of the project.

Many tree species have flourished as a result of the micro-climate and soil conditions created by the planted trees, which are having a positive impact on temperature and humidity regulation, soil formation and soil carbon accumulation.

General rules: expectation management and capacities

Image 03:
Project situation: tree nursery

Image 04:
Project situation: new forest on land stamped by gold mining (compare to image 01)

The core business of reforestation projects is normally the generation of timber. The advantage of claiming carbon credits is the generation of access to international funding in earlier project stages. In the case study, summarized above, initial investment capital was essential due to a significant lack of commercial lines of credit for long-term investments in reforestation projects. In reforestation projects, carbon is not the main revenue stream, and carbon is often perceived from the project owner's perspective as an "easily accessible, low-hanging fruit".

Nevertheless, meeting VCS/CBS requirements is very challenging and requires detailed compliance with the rules. These rules are laid down in complex methodologies and include procedures that need to be complied with, including specific monitoring requests and how to handle complex datasets. During the monitoring of the CCN project in Colombia the team was confronted with exactly 122 different tree species – a variety that had serious implications on the compilation, interpretation, and presentation of the statistics. Among the statistical challenges, a large number of plots had to be implemented to reach a representative sample and not to exceed the permitted error, and large data sets were needed for each tree species, which included such variables as growth curves, density, biomass expansion factor and root to shoot ratio. In addition, because the forestry sector is still a pioneer within the carbon market, there were not a lot of positive models that could be followed.

Whoever is implementing the carbon work – whether it is the project owner or an external specialized carbon company – expectation management (understanding what to expect among all entities involved) is crucial in order to ensure success and to comply with delivery timelines for carbon credits. Extensive training sessions with the implementation team on site, based on the requirement of the methodology, were an important part of the CCN learning process. A clear scheme of responsiveness and an organizational chart had to be defined to avoid misunderstanding and inefficiency.

Expectation management is also needed with regards to transaction cost. In a typical Emission Reduction Purchase Agreements (ERPAs), the responsibility to provide monitoring data is the responsibility of the seller. Yet in forest carbon projects significant costs arise from monitoring activities. In the CCN case study, early incorporation of expected monitoring cost into the budget of the project owner coupled with a significant amount of work by a carbon consultant resolved this issue.

Project validation: how to guarantee a timely and efficient process?

Image 05:
Project situation: "living fence"

The CCN project demonstrated that in order to make the validation process timely and efficient the auditor needs to be selected at the same time that the project documentation is being prepared for validation.

Based on the case study, and South Pole's experience, it is advantageous if the carbon consultant leads the negotiation with the different auditors instead of the project owner. The carbon company's status as "large client" and experience in negotiating contracts can lead to better terms, not only price-wise but more importantly in relation to the expected validation process timeline. Typically, the carbon company has already worked with some or all of the auditors. Past experience working with certain auditors often accelerates the process of communication.

The schedule for the auditor's site visit should be well planned and structured in advance. The visit will likely run efficiently if all documentation that might be necessary for the justification of the contents of the Project Design Document (PDD) is available in both original and electronic formats in the same location where the audit takes place.

Monitoring and verification: where the money comes from

Image 06: Project situation: new forest

Without the successful monitoring and verification of the project there will be no income from carbon credits. Therefore, we suggest taking particular care to develop technical capacities for the field team based on the relevant requirements of the methodology as well as the validated monitoring plan outlined in the PDD. The monitoring plan design should address particular project conditions and take into account any observations made by the implementation team. This ensures that the team is aware from the very beginning of what has to be monitored and is able to achieve the requirements.

It is good practice to implement a pilot sampling. The data taken are used to calculate the standard deviation to elaborate the sample size needed for the biomass/soil samples for getting a representative result. The CCN project's strata had been created according to the baseline land use (livestock farming and gold mining) and the planting year, factors that have a strong impact on the carbon stock. Given the high diversity of trees and uneven patterns of assisted natural regeneration, the original intention to homogenize the strata further, based on the composition of tree species, was proven to be all but impossible.

To make sure that all members of the field teams are aware of the same monitoring techniques, a forestry inventory manual adapted to project's specific conditions should be elaborated. The manual should contain, among other items, detailed information of the sampling design, fieldwork organization, information on how to collect the field data, and descriptions of the data forms. Manuals of this type have proven to be useful at answering questions that arise from field team members during field-measurements.

Data collection is an ongoing process. The sample size has to be updated while more data are available, and new data have to be added to the database. A centralized data system such as an online, server-based and backed-up Monitoring and Verification System (MOVERS) is therefore highly recommended. The complete carbon asset monitoring and verification process is complex; it is often not a part of the standard operating procedures for emission reduction project operators. There is substantial risk in mandatory reporting data being lost, incorrect, or even having not been collected by the implementation team. This results in reduced and delayed issuance of carbon credits, excessive workloads on project staff and high associated costs. The integration of carbon credit centered monitoring activities into one central platform contributes significantly to a reduction in handling costs associated with data/document management while increasing the efficiency and decreasing the amount of errors.

Image 07:
Project situation: planting of seedlings

In the case study, the non-availability of allometric equations of the native tree species did not prevent a successful verification. Instead, the biomass and carbon calculations were based on the measured data at species level combined with the specific density, the biomass expansion factor and the root to shoot ratio. Further, to prove that the verified carbon stock did not exceed the long-term average carbon stock adjusted for thinning and harvest, as prescribed by the VCS, growth curves were created based on the Chapman-Richards growth model. The model resembles a generalized yield model for various tree species for age-class based timber resource projection.

Following this method, aggregate estimates of the mean annual increment (MAI) were calculated based on experience or historical data. As tree growth is not linear, such MAI estimates have to be used in conjunction with a reference age, at which MAI culminates, designated as t_{max}. The MAI at this age is defined as MAI_{max}. The model is applicable to situations where data of MAI_{max} and t_{max} are available.

This example shows that, where data is lacking, there are solutions, a finding that contradicts those who argue that missing curves are a reason for not being able to verify a project with native mixed stands. Intelligent solutions to challenging problems must, however, be justifiable and based on conservative, carbon-wise assumptions.

CCBS requirements: climate, community and bioidiversity impacts

Image 08: Project situation: new forest on previous gold mining areas

The CCB Standard requires proof that a project has net positive impacts on Climate, Community and Biodiversity. While the climate section is largely covered with the data elaborated for the VCS PDD, additional work needs to be done to comply with the social and biodiversity requirements of the standard. When filling in the CCBS format some information has to be provided repetitively in different sections, the same for projects that also seek VCS validation. Therefore, to facilitate joint CCBS and VCS validation South Pole works with the International Forest Carbon Association (IFCA) to submit specific improvements to the CCBS.

The project shall provide a positive impact on the community. It is absolutely worthwhile going that extra mile to fulfill CCBS requirements since local support is a key criterion of forestry projects. Local support was especially important to the success of the CCN project. The project is located in an internal conflict region, and employment opportunities in the formal sector and economic development had been very limited. The investment in reforestation contributed to employment generation and increased sustainable economic activity.

Image 09: Project situation: new forest

CCBS VERIFICATION

The CCN project was the first project verified under the CCBS in Latin America. Only three projects, all of them located in Kenya, were verified before the Colombian project. Even though positive CCBS verification models are scarce and a lack of guidance by the CCBS exists, it is clear that CCBS verification requires three documents:

- The Project Implementation Report (PIR): This is basically the PDD document that needs to be updated and submitted for public comment (following the same procedure as for the CCBS validation process).
- The Monitoring Plan (MP): This document describes the climate, community and biodiversity monitoring procedures.
- The Monitoring Report (MR): This document provides the climate, community and biodiversity monitoring results.

In the CCN project, the direct social impacts were measured during the elaboration of the community monitoring through surveys with employees of the project. The monitored variables were selected based on an evaluation of potential positive and negative direct impacts of the project activity and based on the categories of the “Sustainable Livelihoods Approach (SLA)”. The SLA includes a framework for understanding the complexities of poverty and guiding principles for action. This framework is designed to center around people and the influences that affect how they can support themselves and their families. The basic units of analysis are livelihood assets, which are divided into five categories: human capital, social capital, physical capital, natural capital and financial capital. The survey revealed that it is important for female interviewers to interview female interviewees. This created an environment that enabled women to reply to questions in a more open manner.

The biodiversity inventories of flora were realized in permanent sample plots, which were established as part of, and at the same places as, the carbon stock monitoring. Instead of following a rigid plan for the monitoring of the fauna, it was decided to stick to a more flexible method. The CCN project implemented a system to register all wildlife sightings in the project areas. Employees were trained to write down animals that they saw (what, when, where), describe it and, if possible, take a photo of it. This is a good approach for monitoring fauna such as mammals, since monitoring for such species cannot be done in a limited sample plot on a particular day. This process is continuous and seeks to take advantage of the presence of workers in order to keep a constant watch for different species of fauna.

Looking forward

Image 10: Project situation: local small scale farmers who have found work in the project

The key lessons learnt from the CCN project include:

- The availability and use of an online database, such as MOVERS, results in a data management process that is accurate and efficient, and it avoids unexpected under-delivery of carbon credits during verification.
- In order to standardize fieldwork methodology, a forestry inventory manual needs to be developed that specifically addresses each carbon project.
- Expectation management that is "realistic" is required. It should include all entities involved along with financial and technical components of the project.
- Frequent capacity building and proper alignment of accountability, responsibility and authority are needed to avoid misunderstanding and inefficiency.
- Incorporation of a carbon consultant can facilitate communication between strategic players and auditors, produce more favorable terms, reveal adaptive solutions (e.g. in the case of missing data) and lead to a successful implementation of the carbon cycle.
- The project teams needs to base its expectations about carbon income on realistic assumptions to ensure financially viable planning and project longevity.

In the CCN case study, 128,900 Verified Carbon Units (VCUs) were issued for around 1,280 ha of planted forest in 2011 (the 128,900 VCUs correspond to 70% of the actual CO_2 reductions that are available for sale, while 30% are kept in a buffer pool for unforeseen events). Today around 2,000 ha have been planted; the area stands as a positive example of what additional carbon financing can do within a short time span.

The CCN project activity offers a unique opportunity to obtain valuable knowledge about silvicultural management practices for mixed plantation forestry and suitability of native tree species for commercial plantation forestry. The lack of scientific and technical knowledge of native species can be balanced through collaboration with universities for the elaboration of scientific work (e.g. development of growth curves).

The success of the CCN project sends out a clear signal that with the right approach the joint power of carbon credit related revenue streams and reforestation can be strong drivers for climate change mitigation in the land use sector, implying positive community impacts and biodiversity conservation.

This paper has presented some of the lessons learned from the CCN reforestation project in Colombia, based on issues that arose during the VCS and CCBS carbon cycle implementation of the project. The authors hope that the information contained herein will be valuable to researcher, project implementers, investors, who would like to facilitate VCS/CCBS reforestation.

Resources

Project documentation:
VCS:
https://vcsprojectdatabase1.apx.com/mModule/Interactive.asp?Tab=Projects&a=1&t=1
Project ID: 576
CCBS:
http://www.climate-standards.org/projects/index.html

About South Pole Carbon Asset Management Ltd.
Zurich-based South Pole Carbon Asset Management is one of the world's leading high-quality carbon offsetting companies. In over 20 countries the company enables the implementation and operation of high-quality projects that reduce greenhouse gases, with a focus on forestry and PoA development. In 2011, South Pole was awarded Best Project Developer in Environmental Finance's Annual Voluntary Carbon Market Survey. www.southpolecarbon.com

About Asorpar Ltd.
Asorpar Ltd. seeks to promote urban and rural reforestation and recovery of degraded ecosystems using native species through open-field germination. The company is involved in many areas: reforestation projects, sustainable forest management, landscaping, re-vegetation, transporting and planting mature trees, production of plant material, seed management, environmental impact assessment, and recovery of degraded soils, among others.

For further information please contact:

Yougha von Laer
Senior Forestry Manager
y.vonlaer@southpolecarbon.com
+52 (55) 5564 6793 / 5531 9013

Christian Dannecker
Director of Forestry
c.dannecker@southpolecarbon.com
+57 3117870 924

info@southpolecarbon.com +41 43 501 35 52 www.southpolecarbon.com

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