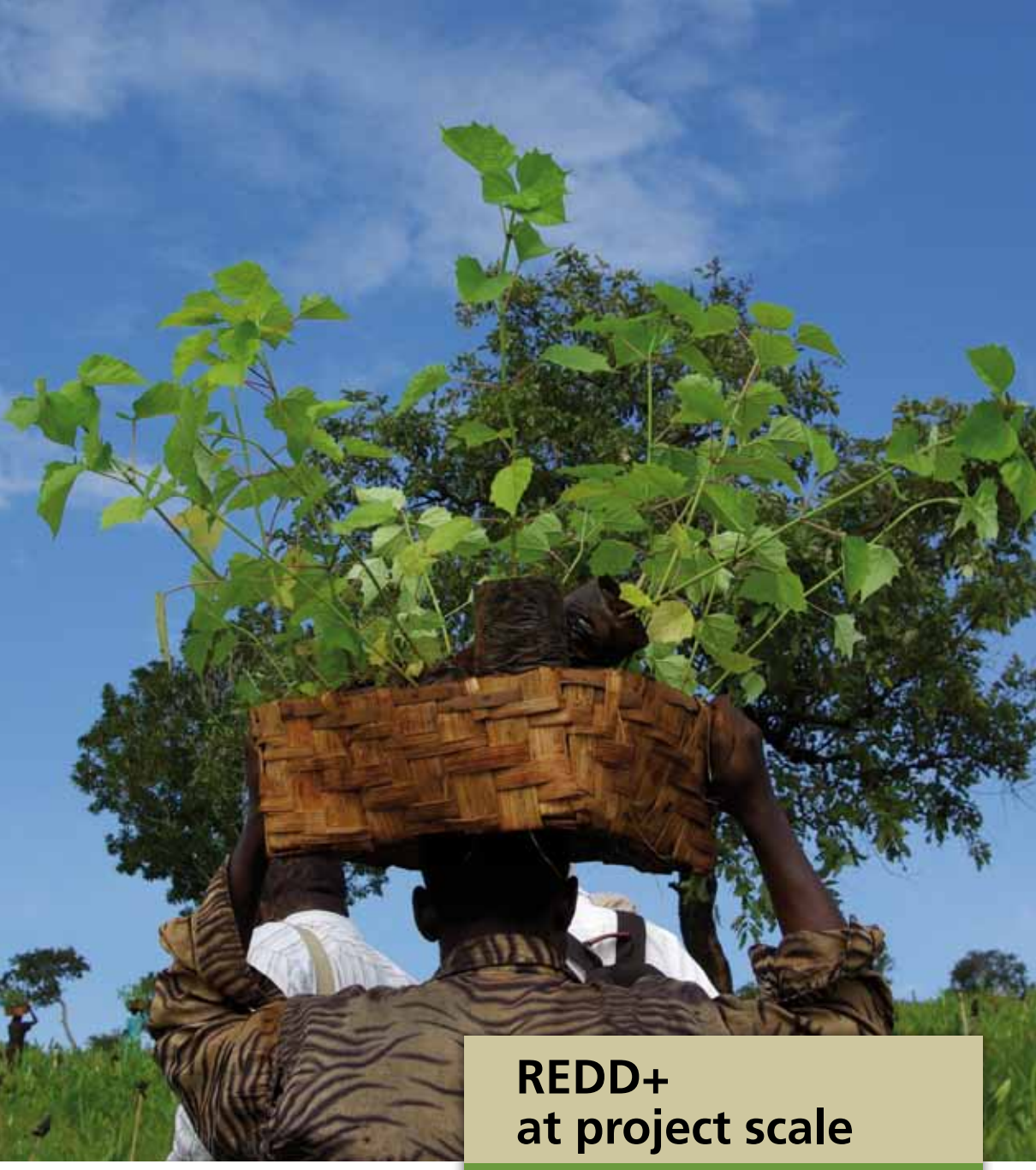

REDD+ at project scale

Evaluation and development guide

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REDD+
at project scale

Evaluation
and development guide

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Preface

Marc-Antoine Martin
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Since 2005, the mechanism for conservation, sustainable forest management and increased carbon stocks known as Reducing Emissions from Deforestation and Forest Degradation (REDD+) has steadily gained ground as a fundamental lever for action against climate change. Many issues are still under discussion and yet to be negotiated at international level, but countries are already making preparations in response to the Bali Action Plan. More than a hundred initiatives are already being implemented at local and sometimes regional project scale, contrasting with or complementing integrated national or sub-national approaches.

The concept is certainly persuasive. For some conservation and local development NGOs, the mechanism offers prospects of sustainable financing for activities in the field. For private investors, whether subject to emission caps or not, it offers possibilities (on a voluntary basis at present) for offsetting their greenhouse gas emissions through projects with a strong emphasis on biodiversity conservation and local development. The integrated nature of the mechanism (development, environment and climate) also interests international funding agencies, which are already financing demonstration activities.

When the FFEM was established by the French government in the wake of the Rio Summit, it had the remarkably prescient objective of linking environment and development issues by promoting the global environment in projects for economic and social development and the emerging in developing countries. The REDD+ mechanism is fully in line with the activities undertaken by the FFEM, which, as an incentive-based concept, it is able to replicate and make more sustainable. Financing activities that contribute to the development of a REDD+ mechanism that combines preservation of the global environment with social and economic development is therefore a priority for the FFEM.

In December 2009 in Copenhagen, furthermore, France undertook to make active contributions to forest preservation.

It is in this context and for the reasons I have given that the FFEM is supporting the publication of this guide, intended for project developers, investors and funding agencies. The moment is timely: by providing keys to understand the fundamental issues of the REDD + mechanism, it will help them to keep risks to a minimum. We hope this guide will accompany and facilitate the development of many REDD+ projects designed to help fulfil our common mission to protect the global environment.

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Contents

Executive summary

The purpose of the *REDD+ at Project Scale: Assessment and Development Guide* is to support project promoters in developing REDD+ projects, and investors or funding agencies in their assessments of these projects. It is not designed to become a methodology or a standard, but to offer insights into existing tools and key questions that have to be addressed at the project scale. On the basis of initial feedbacks from existing REDD+ projects and other more long-standing projects for natural resource management, the guide also deals with aspects that are usually not treated in depth by existing methodologies and standards but are nevertheless crucial to project promoters, particularly the definition of project activities, legal and organisational issues and economic and financial assessments.

Many project promoters responded to the call for pilot initiatives issued under the Bali Action Plan adopted at the COP 13 in 2007. Over 130 REDD+ projects were registered, most of which were launched after 2007, but very few have actually begun to implement project activities. These initiatives are raising questions among civil society groups : could their activities also benefit from REDD+ resources? and if so, how? It is mainly for these groups that this guide was written.

Before moving on to a number of fundamental technical recommendations, it was necessary to take stock of the current status of international negociations and associated issues for project promoters (Part 1). The guide then returns to the main steps in project development, which are: determination of the profile and strategy of a REDD+ project (Part 2), development of the project's organizational structure (Part 3), specific methodological features in REDD+ projects (Part 4), assessing the social and environmental benefits of REDD+ projects and promoting their value (Part 5) and conducting financial and economic assessments (Part 6).

Part 1- What is meant by REDD+ at project scale ?

REDD+ projects cannot be addressed without mentioning the international context. This international context is of considerable importance in the current development of REDD+ projects, and the architecture of the future REDD+ mechanism now being discussed by the UNFCCC will influence their development in the longer term.

In parallel with the UNFCCC negotiations, the main greenhouse gas emitters among the developed nations - especially the United States and the European Union - are showing interest in REDD+. The policy outlook among these players will have a major impact in the short and medium term on the mechanism's development, especially as the outlines of a post-2012 international agreement are a long time coming.

A great deal of uncertainty remains. Although the introduction of national accounting of emission reductions and increased carbon absorption seems very likely - and is desirable in many respects - no conclusions have been reached in the negotiations as to the opportunity of direct carbon remuneration for projects. However, whether or not they receive direct remuneration, these projects will be fundamental to the implementation of REDD+: as of now as a means for taking action against deforestation and forest degradation and for testing national systems, and in the near term by laying the foundations for REDD+ implementation in different countries. Project promoters, already need to give careful consideration to where their projects stand in relation to national provisions, in terms of integration into the national strategy, carbon accounting in national REDD+ registries, development of baseline scenarios and emissions/absorption monitoring.

At present, the ONFI database covers 133 REDD+ projects across the world (including both REDD projects and IFM projects meeting VCS criteria, in both non Annex 1 and Annex 1 countries). Most of these projects are in the identification and feasibility phases; very few have begun the implementation phase. Of these 133 projects, near 30% are in the process of validation under a standard or already validated. The standards that can apply to REDD+ projects in tropical countries are the VCS, CCBs, CCAR, CCX, ACR, Plan Vivo and Social Carbon. However, at present, only the CCBs and Plan Vivo standards have actually certified REDD+ projects in these countries. Although the majority of the projects listed are aimed at the voluntary carbon markets, it is important to bear in mind that this is very much a minority market compared to the regulated markets, and that only if the forestry sector is effectively integrated into compliance markets will forests attract financial flows on a large enough scale to make a real difference to the fight against climate change.

Part 2 – Determining the profile and strategy of a REDD+ project

The dynamics of deforestation and/or forest degradation are specific to each project context, so that each one has to develop its own activities and strategies. REDD+ activities must be targeted to the agents and drivers of deforestation, otherwise they are likely to be ineffective. Therefore, before defining these activities, it is essential to identify the agents of deforestation and any direct and indirect causes that may affect the project perimeter. This is an essential exercise, not only to define the project activities but also for all the other aspects of a REDD+ project. Likely changes in the drivers of deforestation and the possible emergence of new drivers must be analysed in as much detail as possible, because the project activities must be capable of addressing not only the causes of deforestation today, but also those that may appear in the future.

Even though project activities vary from one situation to another, a common feature in all REDD+ projects is that they combine incentives (to increase the value of both standing and cutover forests) and constraints (for example, to prevent a possible increase in the value of cutover forests from becoming an additional incentive to deforestation).

Project activities are selected on the basis of several criteria, with the objective of maximizing the project's cost-effectiveness, social and environmental benefits, and the social acceptability and sustainability of the activities proposed.

Part 3 – Ownership of REDD+ carbon credits and how this can affect the project's organizational structure

The success of any project depends on the development of a sound organizational structure. Ownership of the carbon credits is a fundamental issue, because only the recognized owner of the credits is entitled to market them (or to appoint a third party to do so) and to enjoy the benefits of their sale. Whether they own the credits or are entitled to the usufruct, whether they are actively involved in the project or contribute to it by forfeiting their right to the enjoyment of benefits, anyone able to lay claim to carbon credit ownership is a de facto project stakeholder. Stakeholders must be identified as exhaustively as possible and included in the project's organisational chart.

As well as secure land tenure as a basis for the sound development of project activities, another specific feature of REDD+ projects arises from the fact that national REDD+ strategies and the legal framework in which the mechanism is to be developed are still being discussed and negotiated at international level. The legal and policy foundations for these projects are rarely fully defined, so that it is not necessarily easy to determine the legal nature of REDD+ carbon credits or to identify their owner(s).

Whether they are considered as a personal property, a service or a natural resource will determine whether or not a private player (investor, promoter, user landowner) will be able to claim ownership of these carbon credits and trade them on the market. If the host country law does not identify the owner(s) of the carbon credits, but if it is possible to describe them, by analogy with other existing instruments, as able to be privately owned, then the owner or owners can be determined on the basis of several criteria or indications. To do so, two key questions have to be answered:

- Who has rights over the lands on which the trees are, in the trees themselves and in their fruits?
- Who is contributing to the production of the carbon credits (in other words, who is making contributions that enable the project to take place, given that these contributions may be of different kinds, for example in capital, in land or in industry)?

The project's organization chart aims at clearly identifying the role of each stakeholder in developing and running the project. It should also give a clear picture of the relationships between stakeholders and identify the relationships that need to be formalised through contracts in order to secure the project's viability in the longer term and, as far as possible, its success, as well as the ownership of the carbon credits.

The project's success will depend in particular on the promoter's ability to:

- Identify the players whose active participation and/or support are necessary, and understand the issues arising from their involvement in, exclusion from or rejection of the project.
- Secure their participation in, or support for, the project in the longer term.
- Identify and secure the skills and expertise required for the project to run smoothly throughout its lifetime.
- Share out roles between those involved and ensure responsive coordination.

Part 4 – Specific methodologies for REDD+ projects

Nine methodologies (5 REDD and 4 IFM) are in the process of validation under the standard VCS. These address questions that cover some of the reasons why tropical deforestation was excluded from the Kyoto Protocol, in particular the demonstration of a project's net impact on climate in comparison with a baseline scenario, its additionality, management of leakage and permanence of emission reductions. These methodologies have a number of specific features, as regards managing leakage or determining baseline scenarios and project scenarios, for example.

One of the most decisive issues at project scale is the baseline scenario, since this will influence assessments of the project's impact on climate as well as its economic and financial viability. One of three approaches (depending on the methodology) may be used to quantify future deforestation in the baseline scenario: historical rate, historical trend, and modelling. The choice will depend on past deforestation trends in the project zone, predictable trends in the future, but also capacities of project stakeholders, time and budget available. In all cases, project promoters should take care not to overestimate emissions in the baseline scenario, as this may cause them to overestimate the climate benefits of the project, which would come to light when the time comes to readjust the scenario. Furthermore, the sum of all projects' baseline scenarios' emissions must be smaller than in the national scenario. This conservative estimate principle will also be a key criterion for the emissions monitoring system, along with the significance of selected carbon pools and sources, how existing local information is put to use and the cost-effectiveness of the measures applied.

Discussions are currently ongoing at VCS level to find ways of linking methodological aspects at project scale with the sub-national and national scales. The latest methodology updates aim to ensure that when a project is located in a reference zone for which a baseline scenario has already been validated under the VCS or in the UNFCCC framework, the project has to use this existing scenario. Similarly, when a sub-national or national monitoring system exists, any leakage associated with the project will be estimated through the national MRV system. Project developers are therefore advised to keep a close check on the development of national and sub-national scenarios and monitoring systems.

Part 5 – Assessment and certification of the social and environmental impacts of REDD+ projects

Although it has not been validated by the countries, an outline policy was developed by the Parties to the UNFCCC at the AWG-LCA organized during the COP 15 in Copenhagen. This unofficial document - generally referred to as a "non-paper" - clarifies a number of points under discussion and sets out 19 principles and safeguards, five of which are directly relevant to the question of the REDD+ mechanism's social and environmental impacts.

All projects will be concerned in different ways by these social and environmental impacts. Activities they may implement will vary depending on the environmental value of the project zone and the ties that exist between populations and the area. However, all projects will have to ensure - before they begin and throughout their duration, for ideological and/or strategic reasons - that they have no negative impacts on the environment or on the populations living within or around the project perimeter.

The assessment and monitoring process, whether for social or environmental impacts, must always:

1. Draw up a state of the initial situation, before the project.
2. Describe and/or quantify the initial state.
3. Check for changes in the situation on a regular basis and compare the new status with the initial situation (quantitatively, when this is the method adopted).
4. Adjust project activities if the previous steps show negative impacts on indicators.

On the voluntary markets, there are three standards that are more or less dedicated to REDD+ and where the priority emphasis is on the social and environmental benefits of projects:

- The *Climate, Community & Biodiversity Alliance* standards;
- The *Social Carbon* standards;
- The *Plan Vivo* standards.

Depending on the project's profile and marketing strategy, preference will either be given to one of these standards over the others, or certification may be sought under two standards.

Part 6 – Financial and economic assessment of REDD+ projects

The distinguishing feature of REDD+ projects is that they are geared directly to the production of carbon units that can be traded on dedicated carbon markets. The feasibility of a project will be determined by the income and expenses it generates, which means that project promoters need to make an exhaustive and objective financial analysis in order to assess the viability of their initiatives before they start.
The financial analysis involves three steps that must be rigorously observed and subsequently incorporated into a synoptic analytical framework. To avoid

any bias in the conclusions, it is essential to consider each component as indispensable to the credibility of the assessment:

1. **Development of the project's business model** will introduce fundamental factors such as project expenses and incomes and how they will be spread out over time. This is a crucial stage, in particular because over or under-estimations that come out when wrong assumptions on project expenses and incomes have been made will be detrimental for both project implementation and credibility.
2. **The analysis of financial indicators** will, once the flows generated by the REDD+ project have been estimated, enable an initial appraisal of the project's financial feasibility. This analysis is based on specific profitability criteria and indicators (Net Present Value, Internal Rate of Return, Equivalent Annual Value).
3. **The sensitivity analysis** is the third step, to be undertaken if the previous indicators point to a financially viable project. Its purpose is to identify, among the assumptions made for the financial analysis, those with a significant impact on the project's financial results, and to draw the right conclusions.

REDD+ projects have several specific features that must be considered in the financial analysis:

- They require initial investments that can prove costly.
- First carbon credits will be generated only after emission reductions have been verified, in other words after the first monitoring and verification session.
- Transaction costs (development of the carbon component and certification) are relatively high and in some cases (when implementation costs are low), they can make up a significant proportion of investment costs.
- Carbon revenues may be associated with other types of commercial income that may help to improve prospects for the project's financial feasibility.
- The risks associated with REDD+ projects are substantial.
- REDD+ projects generate additional social and environmental benefits. In virtually all REDD+ projects, added value is not limited to the carbon flows generated: it also stems from other more or less quantifiable benefits, some of which may require specific investments. If these benefits are quantifiable, they must be included in the financial analysis. If not, they should be included in the economic analysis.

There are several ways of leveraging finance, both public and private, for a REDD+ project, and projects rarely use only one source to cover all of their costs. The financing arrangements available today for REDD+ projects are influenced by the fact that the context surrounding the mechanism's development is still evolving, which heightens the investment risks. The numerous environmental and social externalities associated with REDD+ projects give them access to funding through environmental patronage schemes and increase the attractiveness in terms of voluntary offsets. The demonstrative nature of projects now being developed also enables them to apply for public financing, from the REDD+ countries themselves, and through bilateral and multilateral cooperation programmes.

Conclusion

The REDD+ mechanism is one of the areas where the most progress was made during the Copenhagen negotiations. Recent promises under the fast-start scheme have opened prospects for even faster progress, and more and more REDD+ projects are being announced. National REDD+ readiness and implementation will have to include project scale activities. For the time being, projects enable to directly test and feed REDD+ national strategies. In the future, they will be essentials to effectlively reduce deforestation. This is reflected in the importance given to these projects in the Readiness Preparation Proposals (RPP) submitted to the World Bank's Forest Carbon Partnership Fund (FCPF) and R-PP equivalents to other readiness funds.

Despite these positive signals, the future for REDD+ projects is still uncertain:

- The architecture of the REDD+ mechanism to be determined at international level (in a negotiating agenda linked to other less consensual topics) has yet to clarify the role of REDD+ projects, particularly as regards the opportunity of direct carbon remuneration for projects;
- Although the validation of VCS methodologies should lead to certification for many projects, the voluntary markets, which are often a component in corporate communication strategies, have far more limited capacities for absorbing trade in carbon credits than the compliance markets;
- The European and American markets seem prepared to open up to forest carbon credits, but a lots of uncertainty remains and procedures have yet to be developed.

While their importance is undeniable and seems to be recognised, very few projects already Started the implementation phase. The lack of available funding, especially to support early stages of the project development, is the main barrier. Possibilities remain and will remain limited on voluntary market and uncertain on compliant one. In addition, readiness funds are hardly available for project developers.

Even if it shouldn't lead to unreasonable development of REDD+ project and arouse too high expectations from local stakeholders, can't we hope that a portion of the fast-start funds will be used in addition (quantitatively, but also because different procedures can be used) to funds that are already available to develop projects? If they live up to their promise, these interim financing arrangements could tide projects over until such time as their position on international markets becomes clearer, while also making a real contribution to climate change action.

Part 1

What is meant by REDD+ at project scale?

Fuel wood transportation in Cameroon © ONFI

1 What are the international negotiations saying about REDD+ projects?

Before we go into REDD+ projects in detail, we need to see where they stand in the context of international negotiations. At present, REDD+ activities at project scale are aiming for the carbon markets or are financed by public REDD+ readiness funds, but how they will evolved in the longer term will depend closely on the procedures established to implement the mechanism at the international level. Moreover, these international discussions will have a considerable impact on project methodologies.

Whether at the international, national or sub-national scale (including the project scale), the question of how to guarantee the environmental integrity of the REDD+ mechanism has been challenging technicians, researchers and negotiators for several years now. REDD+ initiatives must be guaranteed to have a net positive impact on climate over the long term, in other words, the emission reductions must be real, permanent and not merely a matter of transferring emissions elsewhere.

Therefore, we need to look into how the project's impacts on climate are estimated, how permanence is guaranteed and how leakage can be handled.

- Guaranteeing the project's **net positive impact on climate** means comparing actual observed emissions with a so-called baseline level of emissions, which is the theoretical level of emissions that would have been released without the REDD+ mechanism. Determining this baseline, or reference level, is an important methodological issue, since deforestation is a complex process in which trends are difficult to predict.
- Guaranteeing **permanence** means making sure that trees that are protected today will not be felled tomorrow.
- The **risk of leakage** arises on two levels: the agents responsible for deforestation may move elsewhere, and pressures on forests may be transferred to other areas, particularly when market forces come into play.

These questions relating to leakage, non-permanence and the estimation of a project's impact on climate, will be detailed in further sections of this guide. However, it is important for readers to keep them in mind as they represent fundamental aspects of REDD+ at the project scale as well as in REDD+ international negotiations.

1.1 - REDD+ negotiations under the UNFCCC

The opportunity of introducing a mechanism providing incentives for reducing greenhouse gas (GHG) emissions from deforestation and forest degradation (REDD) has been the subject of very active negotiations since the 11th Conference of the

Parties (CoP) to the United Nations Framework Convention on Climate Change (UNFCCC) in Montreal in December 2005. REDD is part of an action plan adopted by the Parties to the climate convention during the conference in Bali in December 2007 (CoP-13). It was anticipated that this action plan would lead to the adoption of a new international agreement on climate change at the Copenhagen conference (CoP-15, December 2009), but an agreement will probably be postponed at least until CoP-16, which will be held in December 2010 in Cancun, Mexico.

In response to the various UNFCCC declarations and decisions concerning the REDD+ mechanism and following-up to the 2007 Bali conference in particular, demonstration activities have been developed and numerous REDD+ projects announced. However, a number of fundamental issues have not yet been resolved, including the question of scope, referring to the activities actually covered by the mechanism, and the question of the accounting and crediting scale, where the point at issue is how projects implemented on a national territory by non-government players will tie in with government policy.

• The issue of REDD+ scope

The Bali decision gives a broad definition of the REDD+ mechanism scope, which covers activities of:

1. Reducing emissions from deforestation;
2. Reducing emissions from forest degradation;
3. Conserving forest carbon stocks;
4. Managing forests sustainably;
5. Increasing forest carbon stocks[1].

This definition has been maintained up to now. It is therefore likely that countries participating in the REDD+ mechanism will be free to include, among those activities, the ones they choose as best meeting their own national priorities. The Copenhagen text, which could not be formally adopted as a Decision of the Parties, nevertheless calls for provisions guaranteeing that natural forests with abundant biodiversity will not be converted into timber plantations.

In practice, the nature of the activities included by any given country will also depend on the technologies available to monitor GHG emissions (monitoring forest degradation is highly complex, for example), and also on the relative weight of these activities compared to national GHG emissions from the forestry sector.

• Where do these projects stand in relation to the three phases of the REDD+ mechanism

Concerning implementation and financing procedures, a consensus emerged (but was not officially approved by the CoP) in favour of a process in three successive phases[2]:

1. Whether or not (re)forestation activities will be included in the REDD+ is not yet clear: afforestation may be included in the post-2012 period, either (i) via the CDM, with possibilities for changes in scale via the programmatic CDM, or (ii) via REDD+, as demanded by China and India in particular. If reforestation activities remain eligible for the CDM, emission credits generated by CDM projects will not be counted under REDD+ activities, to avoid any risk of double accounting. The same will apply to credits generated by CDM projects currently being implemented, assuming that afforestation is included in the scope of REDD+ activities in the future.
2. For a detailed description of the different financing phases, readers are referred to the Option Assessment Report published by the Meridian Institute. The IWG-IFR report and Chenost et al. 2010 also describe these different phases in detail.

1. An initial phase to prepare national strategies and build capacities;
2. An intermediate phase to implement policies and measures;
    a. Capacity building in key institutions and policy reforms,
    b. Payments based on the performance of REDD+ activities, to be assessed on the basis of indicators providing an approximation of the emission reductions to be obtained (number of hectares of protected forests, for example);
3. A final phase based on payment for emission reductions, to be estimated in comparison with a baseline scenario by means of a reliable and transparent monitoring, reporting and verification system (MRV).

Box 1.1
The different approaches of the REDD+ mechanism in terms of scale

In the international negotiations, although some countries (such as the United States, Colombia and Indonesia) have firmly expressed a position in favour of a project approach similar to that of the Clean Development Mechanism as established by Article 12 of the Kyoto Protocol, most of the parties to the UNFCCC seem to favour a national approach.

In the national approach, any country wishing to do so would have to establish a national strategy and adopt a national baseline level of GHG emissions from deforestation and forest degradation. These countries will receive payment if their emissions are reduced compared to the baseline level. A national emissions monitoring system would also be established to verify that these emission reductions are real. It is important to stress here that what is at issue is not the opportunity of developing REDD+ projects, but the scale at which credits or financing will be awarded. The principle of the national approach is that the beneficiary of the carbon credits generated is the State, which would be responsible for distributing them among the concerned stakeholders in accordance with procedures established during the preparation phase. Project activities would be implemented *via* a system of domestic projects under State supervision. This is the system already applied in some developed countries as part of their GHG emissions reduction policies and to comply with their Kyoto Protocol commitments (the mechanism is similar to Joint Implementation). However, it must be borne in mind that, unlike REDD+ host countries, developed countries which have introduced a domestic projects policy, already have a cap on their emissions *via* a quantified reduction or limitation target under the Kyoto Protocol, and that all of their emissions or removals are covered by a national inventory.

A third approach, known as the *"nested approach"* (supported by some of the Latin American countries), involves starting with an approach involving activity development and crediting at project scale before establishing a national approach. Under this approach, projects would continue to generate credits directly after the switch to national-level accounting.

While it is likely, and desirable in many respects, that national-level accounting of emission reductions and increased absorption will be established, the question of direct remuneration to projects has not yet been resolved by the negotiators. Whatever the outcome - adoption of national-level accounting or the nested approach (see box 1.1) - it will be possible for REDD+ projects development to

be tied in more or less closely with national activities: even with a strictly speaking national approach, some factors of deforestation will need to be addressed at local level through specific projects, while emission reductions would be counted at the national level only. Table 1.1 shows how REDD+ projects would contribute to the different phases of the mechanism.

Table 1.1:
Project contributions to the different phases of the REDD+ mechanism

	Phase 1	Phase 2a	Phase 2b	Phase 3
Benefits of the projects	• Testing and providing input to the national strategy • Capacity-building among national private and public stakeholders, including in areas at risk of deforestation • Channelling private investments to the country • Early reductions in deforestation (fast-start) • Testing different methodological options and providing input for the development of the national scenario and MRV system		• Reducing deforestation in zones where activities at central or provincial level would have little or no effect, thereby enabling the state to focus its efforts on other measures • Attracting interest in REDD+ activities in the host country's private sector • Channelling private investments to the country • Testing different methodological options and providing input for the development of the national scenario and MRV system	
Possible project types	• State-supported pilot projects (readiness fund) • Direct crediting to projects (nested approach) • Voluntary market projects		• Compliance projects (financing *via* State redistribution of earnings to project promoters) •Direct crediting to projects *(nested approach)* • Voluntary market projects (depending on countries)	
Key issues addressed	• Anticipating issues arising in phases 2b and 3.		• Conversion of voluntary projects into compliance projects or direct-crediting projects under the international REDD+ mechanism • Authorisation procedures • Double accounting • Redistribution from national to projects • Additionality and leakage risk • Methodological articulations, etc.	

The REDD+ mechanism is one of the very few issues on which negotiators made progress during the Copenhagen Conference. By the end of the Conference, the negotiators had reached a compromise on fundamental aspects of the mechanism (except on scale), but hopes for an overall agreement were dashed as no decision could be reached. However, the Copenhagen conference did lead to Decision 4/CP.15 asking the developing countries to take a number of methodological aspects into consideration (identification of deforestation factors, establishment of robust and transparent monitoring systems at national and, if appropriate, sub-national levels), particularly for the implementation of activities initiated since the Bali conference on the basis of Decision 2/CP.13. In pursuance of the Copenhagen Agreement, and with a view to reaching an international agreement in the shortest possible time, the agenda for the 2010 negotiations will focus in particular on how to determine national baseline scenarios, on resolving outstanding issues and on placing the mechanism for coordinating national financial support to REDD+ activities on an operational footing.

1.2 - REDD+ activities outside the scope of the UNFCCC

Whatever progress is made under the auspices of the climate convention, it must be stressed that the majority of developing countries have made unilateral commitments to reduce their GHG emissions. This is the case, for example of the European Union, which is aiming by 2020 for a 20% reduction in its emissions, compared to 1990 emission levels, and with promises made by developed countries listed in Annex 1 of the Copenhagen Agreement. Some of these are intending to press for REDD+ implementation - either in addition to their internal reduction efforts or as a flexible mechanism enabling them to reach compliance with part of the targeted reduction of emissions achieved in developing countries (as with the CDM under the Kyoto Protocol), which requires that REDD+ credits are approved for this purpose. In parallel, the number of REDD+ projects is increasing on the voluntary offset markets, reflecting interest in projects of this type among investors.

• Unilateral initiatives in developed countries

In parallel with the UNFCCC negotiations, the main GHG-emitting developed countries – the United States and European Union in particular - are now introducing incentives to encourage REDD+ type activities. The kinds of policies they decide on could have a significant impact both in the short and medium terms on the mechanism's development, especially as the outlines of an international agreement for the post-2012 period are still far from clear.

The European Union Member states may allocate to REDD+, part of their revenues from auctioning EU-ETS quotas for the 2012-2020 period. The money raised could probably be allocated to capacity building and the development of national REDD+ strategies in developing countries and, eventually, to financing for emission reductions under a national approach. However, it seems unlikely, in the short and medium terms, that the EU-ETS will accept credits generated by REDD+ initiatives. This is because, although it may become possible for governments to use REDD+ credits between 2013 and 2020 to reach their national objectives in sectors not covered by the ETS (*Effort Sharing Decision*),

this would depend on the (early) adoption of an international agreement providing for REDD+ credit fungibility. For sectors covered by the EU-ETS, the European Commission is opposed to any credit linking until 2020, provided the same preconditions would be satisfied.

A decision on REDD+ is eagerly awaited from the United States, where a cap-and-trade system is now under discussion. As in the European Union, this could generate substantial resources for REDD+ implementation through quota auctions. Furthermore, it would enable American companies subject to quotas to comply with their obligations by purchasing REDD+ credits. However, the introduction of a cap-and-trade system in the United States is highly controversial and the outcome is far from certain, especially as the most recent version of the American Power Act (APA) – published at the time the writing of this guide – backtracks substantially on the subject and brings the whole idea of creating a Federal cap-and-trade mechanism for REDD+ into question. Over and above this issue, the draft APA seemed to exclude any possibility for direct crediting to REDD+ projects. At the time of completing the final draft of this guide, a vote seemed likely in mid-July, so this question should be followed up closely.

• The voluntary carbon markets

REDD+ projects are clearly attracting interest on the voluntary markets. The demand for credits reflects growing interest among companies in social and environmental responsibility, including among those not subject to quotas and mainly for purposes of communication. The co-benefits expected from REDD+ projects, whether social and economic (job creation in agro-sylviculture, diversification of livelihoods, poverty reduction, etc.) or environmental (erosion control, protection of water resources and biodiversity, etc.), are of particular importance in this regard.

However, it should be noted that only 20.8 MteqCO_2-e in forest carbon credits have been traded to date on these markets (*Ecosystem Marketplace*, 2009). Credits generated by REDD+ projects specifically account for only 3.1 MteqCO_2-e. These figures should alert project promoters to the fact that the voluntary markets may be unable to absorb the large credit volumes announced by many REDD+ projects[3].

1.3 - Consistency between projects and national REDD+ strategies

Many countries, prompted by a number of international initiatives (FCPF, UN-REDD), have already begun the readiness for the introduction of a REDD+ mechanism at national level (phase 1 of the REDD+ mechanism as described in 1.1.1). Despite uncertainties on the approach that will ultimately be adopted under international negotiations or at the domestic level (in the EU or the United States for example), project promoters need to be very careful that their projects are consistent with the host country's national strategy.
In the absence of a recognized REDD+ mechanism in international and national laws, REDD+ projects now being developed are targeted to the voluntary

3. For a more detailed analysis of the position of forest carbon projects on the voluntary markets, see Chenost *et al.*, 2010.

carbon markets and standards open to REDD+ activities (VCS, CCBs, CCAR, CCX, ACR, Plan Vivo, Social Carbon; for a description of thee standards, please refer to Part 1.2.3). At the time of writing, the only standards that had effectively certified REDD+ projects in tropical countries were CCBA and Plan Vivo. If a national approach is finally agreed to at international level, then - once the host country has adopted a national baseline emissions level and established an emissions monitoring system - REDD+ projects will have to be incorporated into the national system. They may then be aimed either at the voluntary markets as before, or become compliance projects. This will depend on many different factors, including the national regulation in force, the scope of the mechanism chosen by the country, the project promoters chosen, etc. Other pilot projects at the national level, not aimed at the voluntary markets, are also being set up in some countries (DRC for example); these are aiming to test aspects of the preliminary national strategy without attempting to generate any carbon income in the short term. Provided they effectively reduce emissions or increase removals, these projects could (in phases 2b and 3) become compliance projects or certified voluntary ones.

The integration of voluntary projects or pilot national projects into the national REDD+ system can be expected to occur at three levels:

1. Integration into the national strategy,
2. Accounting in a national REDD+ registry,
3. Baseline scenario and emissions monitoring system.

• Project integration into the national strategy

Deforestation is a complex process involving interactions between multiple causes (economic, social, institutional, cultural, etc.). Reducing deforestation therefore means implementing an integrated and multi-sector national strategy (forests, agriculture, energy, transport, mining, spatial planning, economy and finance) that combines regulation and control measures with economic and fiscal incentives and is applied at national and local levels. In this context, the REDD+ project approach - which assumes that activities are restricted to a particular geographic zone, set of stakeholders and period of time - could become a tool for implementing the national strategy. However, project development cannot suppress every possible factor of deforestation.

It will be up to each country to decide how to implement the national REDD+ strategy, taking their national circumstances into account, if necessary by implementing REDD+ project activities or programmes. Those options should preferably be analysed at the earliest stages of developing the national REDD+ strategy, and in consultation with the stakeholders. In several countries, REDD+ project promoters are involved in coordination platforms that are in contact with the national authorities responsible for elaborating the country's REDD+ strategy.

It is important for project developers and potential investors to be in contact with the national authorities in charge of REDD+ policy from the earliest stages of project development, and to ensure, as far as possible, that the project is consistent with the national strategy being developed.

• The problem of carbon accounting

Once a host country has adopted a national accounting system for emissions and removals in its forestry sector, the question will arise, regardless of the approach decided on, of how the project scale will tie in with the national scale (see Box 1.1 above). It is a given that one and the same carbon credit cannot, for reasons of environmental integrity, be used twice, once by the country including it in its emission absorption/reduction balance and once by the project proponent, even if it is traded on the voluntary market. The VCS is currently considering new rules to facilitate articulations between projects and sub-national and national baseline scenarios, MRVs and accounting systems, in order to prevent the same emission reductions from being counted twice or more.

This could lead to two different scenarios:

1. Project activities are not included in national accounts (for example, the project aims at reducing emissions linked to forest degradation and the country is only monitoring emissions or removals associated with deforestation[4]): in this case, the project can continue to generate carbon credits independently of the national accounts.
2. Project activities are included in national accounts (which will always be the case for projects concerned only with reducing emissions from deforestation - RED): in this case, the project will have to negotiate with the host country. There are two possible outcomes:
    - the host country agrees to deduct the credits generated by the project from its national accounts (nested approach), and the project may continue to generate credits under voluntary market standards or under an international REDD+ mechanism;
    - the credits generated by the project are included in the national accounts and the host country pays the project developers directly.

It should be noted that in theory, some projects could combine activities that are included in the national accounts and others that are not. This could be the case, for example, with an REDD VCS project (deforestation and degradation) in a country which has adopted a system that only concerns deforestation under the post-2012 international REDD+ mechanism. In this case, some of the credits could still be traded on the voluntary markets (those generated by reduced forest degradation), while others would be included in the national accounts (those generated by reduced deforestation).

The policy adopted by the host countries concerning project activities and credit accounting will have a major impact on the future of voluntary projects. It is therefore essential to have in-depth discussions with the national authorities from early stages of project development.

4. International negotiations since COP13 in Bali have officially registered the idea of a REDD+ mechanism. The countries will therefore have to notify their carbon emissions/removals for all activities covered by the REDD+. However, for some of these activities, emissions/removals will be low and/or have little mitigation potential. If the emissions/removals generated by this activity are not significant and their non-inclusion does not lead to an over-estimation of the country's emission reductions, the country will have to demonstrate this and may then choose not to monitor them. In this case, this activity may be considered as not included in the national accounts.

• The baseline scenario and the emissions monitoring system

The adoption of a national baseline emissions level is critical to national REDD+ strategies, since it establishes the level against which the country's REDD+ performance will be calculated (i.e., the emission reductions and increased removals to be achieved in phase 3).

It is also a complex exercise, given the difficulties involved in predicting future deforestation trends. At best, scenarios may be based on key variables that will facilitate decision-making (for example, trends in population density, GDP or other economic development indicators, spatial variables such as the location of infrastructure, etc.).

The national baseline scenario will be as much a result of internal negotiations as of international negotiations between Annex 1 and non-Annex 1 countries. These negotiations will concern both the overall baseline adopted, which will be the benchmark for the joint efforts that tropical forest countries agree to undertake, and the baseline for each country, which will determine how these efforts are to be shared out.

When funds are transferred from the government to sub-national entities (projects and/or provinces or other administrative entities) on the basis of their results in reducing deforestation, the baseline scenario will have to be scaled to the level of these entities (this can be done either by using the national scenario and generating results on the scale of the entity, or by building up specific scenarios, given that they will have to use various data obtained for the national level, on macro-economic aspects for example). Scaling may also be relevant for countries where land-use change varies widely and where deforestation agents are fairly static.

On the other hand, projects targeting the carbon market and projects that may receive credits directly and whose results are deducted from the national accounts will have to present methodologies that are compatible with those implemented at national level to ensure consistency in deducting credits.

It is therefore in the interests of project promoters to keep a close check on the development of the national baseline scenario and how it is likely to be scaled down to the sub-national level, to ensure that the baseline level adopted for the project is consistent with the baseline for the region where the project is located.

In fact, it is likely that baseline scenarios developed by REDD+ projects in different regions will provide valuable learning experiences and feedback for the development of national baseline scenarios. It may be in the interest of projects located in the same region to develop a common baseline scenario, which would not only allow them to share development costs but also to enhance the visibility and credibility of their projects in the eyes of regional and national authorities.

This means that the national baseline scenario developed will probably result from a convergence between a top-down approach (from the negotiating level to the national level and possibly decentralized levels) and a bottom-up approach (from project level to the regional and national levels) (see table 1.2).

Table 1.2:
Convergence of different scales to develop a baseline scenario

	Data	Methods	Results
Bottom-up approach	• Data collected at the sub-national level will be useful to understand disparities that the national scenario will need to take into account, as well as the national circumstances on which to base negotiating arguments	• Methods tested at the sub-national level and providing input to discussions on the appropriate national approach • Capacity-building for the use of these methods	• Verification of the relevance of the national scenario as regards representations of sub-national deforestation processes
Top-down approach	• National data, especially on macro-economic aspects, will be useful to take various indirect drivers of deforestation into account in sub-national scenarios	• International recommendations for developing national scenarios • Project guidelines set out at national level	• International models, potentially scalable to the national level • National models, potentially scalable to the sub-national level

The project monitoring system will also have to be compatible with the national system so that emission reductions stemming from the project can be identified in the national registry. Monitoring systems will have to be consistent on several issues, including for example, project activities and analysis level of details.

The approach should also be convergent, insofar as the monitoring systems established at the project level are able to feed into the national system (data and methodology) and the national level may also supply information to project promoters on carbon stock data for different ecosystems. As for the baseline scenario, project developers are advised to keep a check on the national process and to establish partnerships with neighbouring projects in order to establish forest carbon inventory systems that are consistent from one region to another (which will also generate economies of scale and enhance credibility).

2 REDD+ projects today

A number of questions, both political and economic, regarding the future of the REDD+ mechanism at project scale, are still unresolved. Despite this, the mechanism is attracting interest in many different quarters: since 2007, innumerable news items, announcements and citations have referred to REDD+ initiatives, sometimes giving the impression that many projects already exist or are being developed. Some 500 projects are referred to in announcements alone, although a more in-depth analysis only provides basic information on 133 projects. Of these 133, only 39 are in the process of validation or registration with a standard. To draw up our inventory, we had to define exactly what is meant by an “REDD+ project”, and this necessarily involved some presupposition. For this guide, it was decided to define REDD+ projects as initiatives aiming to halt, effectively and in a given defined zone, the dynamics of deforestation and/or forest degradation in order to generate tradable carbon credits, calculated in accordance with an estimated baseline scenario, in exchange for measured, verified and validated avoidance of CO2 emissions. The implications of this definition for the projects selection, as well as the methodology used for the inventory, are described in Annex 1.

2.1 - Inventory of REDD+ initiatives at project scale

This study identified 133 REDD+ projects across the world. Of these 133 projects, 80% are REDD projects (as defined by the VCS – see Chapter 4), mainly under development in tropical forest countries, and 20% are IFM projects (of which 85% are being developed in Annex 1 countries). Almost 40% of the inventoried REDD+ projects are in Latin America (see figure 1.1). At present, most REDD+ projects under development are in Indonesia and Brazil (21 and 16 projects respectively according to the ONFI inventory). Most of the projects therefore appear to concern heavily forested countries where rates of deforestation are historically, in humid forests with a high density of biodiversity (Wertz-Kanounnikoff *et al*. 2009, and see Box 1.2 for an analysis of the factors accounting for the location of REDD+ projects at present).

Box 1.2 – Factors accounting for the geographical location of current REDD+ projects

To understand the current geographical distribution of REDD+ projects, Cerbu *et al.* (2009) looked into the motivations of project developers and investors in selecting their project zones. The main official criterion cited concern over benefits for biodiversity, followed by benefits for communities, and lastly, the fact that the zone is under threat of deforestation. Unofficially (i.e. other than in project documents, web sites, commercial documents, etc.), developers, promoters and investors particularly mention pre-existing relationships with national and/or local players and the fact that the different stakeholders (NGOs and governments) are taking an interest in the zone. As Cerbu points out, these criteria, whether formalized or not, are mainly accounted for by the fact that many current REDD+ initiatives are extensions of existing conservation projects focusing essentially on biodiversity conservation. This also explains the interest taken by different players in the zone, pre-existing relationships with stakeholders and the fact that carbon value appears to be of fairly secondary importance (Angelsen *et al.*, 2009).

In 2009, Ecosecurities conducted a survey on expectations among private enterprises regarding forest carbon projects. This showed that social and environmental benefits were a fundamental reason for their interest. This may also explain the fact that these benefits are mentioned in particular by project developers. It should also be remembered that the only standards that actually certify REDD+ projects today are the CCBA and Plan Vivo standards, which focus primarily on the social and environmental benefits of forest projects.

Although certification is a stated aim in most projects, fewer than one third are in fact registered or are in the process of validation. The most frequently used standards for REDD+ projects at present are the CAR (for improved forest management projects in the United States) and CCBs (see figure 1.2). Regarding project size, 50.000 ha is the mean among the projects listed, and about 40% are large-scale projects (>100.000ha) (see figure 1.3). Size profiles are highly variable from one region to another, ranging from a mean size of 21.000 ha in Central America to more than 230.000 ha en Asia.

Most of REDD+ projects identified around the world are recent and still in their early stages. There are a few older projects for avoided

Figure 1.a - Location of REDD+ projects

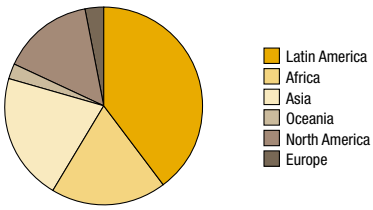
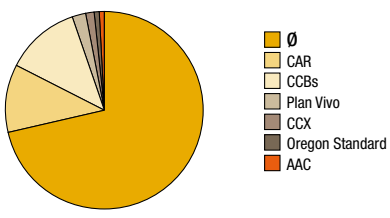
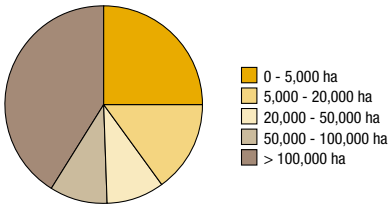


Figure 1.b - Standards used in REDD+ projects



deforestation that explicitly state action against climate change as an objective (such as the Noël Kempf Climate Action Project in Bolivia, which began in 1996, or the Mbaracayu project in Paraguay, which began in 1991).

Figure 1.c - Size of REDD+ projects



2.2 - Chronology of a REDD+ project

Beyond project implementation, carbon valuation of avoided deforestation projects is realised in several stages. The most common is a three-stage process: identification, feasibility and implementation (see table 1.3), although there is often some overlap between the three. A project's state of advancement depends on the level of data available and the status of activities in the field. Each phase will produce a result that must be validated by the certification bodies.

How long the project will take to curb the dynamics of deforestation will depend on the initial deforestation and forest degradation situation, but also on the REDD+ activities to be developed. The project's lifetime will depend on maintaining additionality and on its net positive impact on climate. The end of the project does not necessarily equate with the end of deforestation, since it will not be possible to halt deforestation entirely in some zones, but rather with the establishment of enduring processes at project scale that effectively prevent deforestation.

On this point, it is important to remember that standards have different requirements regarding project lifetimes, which may range from a minimum of 20 years to a maximum of 100 years for the VCS and Plan Vivo standards. The 20-years minimum is a constraint aiming to guarantee the permanence of emission reductions. The lifetime of a project is defined at its start. Depending on the standards used for certification, the accounting period may also be renewed, subject to adjustment of the baseline scenario (the VCS requires a re-evaluation of the baseline scenario every 10 years). Obviously, none of the existing REDD+ projects have reached the end of their lifetime.

2.3 - REDD+ standards

There are several standards on the voluntary offset markets that certify credits generated by REDD+ projects or aim to do so.

• What are the standards for?

Standards provide the maximum possible guarantee to financial institutions, investors and purchasers of carbon credits that projects will produce the stated effects on deforestation and that the resulting credits satisfy the MRV

Table 1.3: Phases in REDD+ project development

Phase	Steps	Data level	Products / Documents
Identification *This is when project opportunity is analyzed, to determine whether, and on what scale, the project will be able to generate carbon credits.*	• Identification of the project zone • Identification of deforestation agents and drivers • Basic forest cover assessment • Contacts with local stakeholders (letter of approval from the authorities) • Rough estimate of carbon potential (deforestation rate and carbon density in the zone) • Additionality and eligibility tests • Identification of possible project activities • Initial financial analysis	The data used must be reliable, credible and reflect real trends as closely as possible. Nevertheless, project developers may use data processed not specifically for the project but at a larger scale and/or for similar regions. To avoid overestimating carbon benefits, which would be counterproductive in later stages, the data must be selected and processed on a conservative estimate principle (taking the lowest self-penalising estimation to remain on the side of caution).	Project Idea Note (PIN) or equivalent Besides the opportunity analysis itself, this document will clarify the project's profile and help to locate financing for subsequent phases
Feasibility *This is the stage when project feasibility is analysed, to produce, as accurately as possible, an* ex-ante *quantification of the project's carbon benefits. In the feasibility phase, the project will not yet be generating carbon credits and project activities will not have begun. It is also the phase when the project will be validated by the standards.*	• Analysis of deforestation agents and drivers • Estimation of the baseline scenario • *Ex-ante* estimation of the project's effectiveness (project scenario and leakage) • Project registration with national and local authorities • Agreements with landowners and/or beneficiaries of carbon credits • Development of a monitoring plan • Selection of project activities and development of implementation procedures • Financial and economic analysis of the project • Analysis of the project compared to the national strategy, if any, and with respect to national laws and regulations (impact studies, environmental and social standards).	The data used must reflect trends that are specific to the project zone. Data that do not apply specifically to the project may only be used if they give a true reflection of the situation in the project zone. In many cases, items will need to be produced specifically for the project. To avoid overestimating carbon benefits, which would be counterproductive in later stages, the data must be selected and processed on a conservative estimate principle.	Project Design Document (PDD) or equivalent As well as providing the feasibility study, this document will be submitted to the standards authorities for certification. It will answer various questions from financial institutions and investors.
Implementation *This is the phase when a project can generate carbon credits. It must enable* ex-post *quantification of the carbon benefits and verification of the social and environmental impacts of the project. This phase is usually divided into several monitoring and credit certification sessions*	• Implementation of project activities • *Ex-post* estimation of their effectiveness • Monitoring of carbon, social and environmental benefits. • Redistribution of benefits.	The data used must be produced for the project and/or in the project zone. These are monitoring data and must be sufficiently accurate to allow monitoring indicators to be assessed.	Carbon credits Monitoring reports and credit certification reports.

principle (measurable, reportable and verifiable). Standards provide a practical and methodological framework to guarantee the environmental integrity of project activities by helping developers to avoid various risks inherent to REDD+, which are:

- **Risk of not generating net positive impacts in terms of climate change mitigation**

This can happen for different reasons:

- because deforestation is not effectively reduced; in other words, the actual verified level of emissions in the project turns out to be higher than emissions in the baseline scenario (absence of results),
- because emissions would have dropped even if the project had not been implemented, so that it cannot claim to have reduced emissions (the project is not additional),
- because the emissions avoided in the project zone are in fact the result of a displacement of pressures in other forest zones (the project has engendered leakages for which it can be held directly responsible).

Methodological guidelines of the present guide describe tools provided by the standards to ensure that REDD+ projects have a net positive impact on climate.

- **Risk of non-permanence**

This is the general risk of not maintaining forest cover, which must be addressed by each individual REDD+ project and anticipated in every one of its aspects, whether organizational or methodological. The risk of non-permanence may arise from:

- a lack of genuine support for the project from agents of deforestation (absence of real results),
- natural risks (fires, pests or diseases, land slops, etc.).

The standards check for non-permanence risks in the project activities selection and in the organizational structure of the project.

- **Risk of failure to respect local and indigenous populations**

REDD+ projects bring economic value to forest ecosystems. Because these ecosystems provide a number of basic environmental services (food, goods and fertile soils), they already have a high intrinsic value for the local populations who rely on them. Projects,could encourage speculation in those areas and endanger community rights over the lands, especially when these rights are not recognised by governments. The risk of ignoring indigenous populations is increasingly addressed in international REDD+ negotiations. Some of the standards place an emphasis on the social and environmental impacts of projects. These are detailed in Part 5 of this guide.

• The different categories of REDD+ standards

Several standards exist, with different approaches and eligibility criteria. The choice of standards will depend on their specific eligibility criteria but also on the project proponent's strategy and on the financial opportunity of standardising the project in question (is it worth trying to cover transaction costs for a small-

scale project generating very small profits? Will certification really add value to the generated carbon credits? etc.).

The standards fall into two categories:

- The ones that enable projects to generate carbon assets expressed in tonnes of avoided CO_2 emissions, in accordance with predefined rules and criteria on the risks of non-permanence, non-additionality and leakage and with the evaluation of the project's net impact on climate. The most widely known of those **carbon standards** include the VCS, CCX, CAR, Plan Vivo and ACR.
- **Project standards** that guarantee overall project quality without allowing them to generate credits, but which usually emphasise related issues such as biodiversity or the project's social and economic impacts: these include the *Community, Climate and Biodiversity Alliance (CCBA) and Social Carbon standards*.

These categories are not mutually exclusive; rather, they are complementary and project promoters usually seek to use both at once so that they can generate credits that reflect the project's positive impacts on climate while also ensuring that the activities have additional social and environmental value.

Project standards will be described in detail in the recommendations concerning the environmental and social impacts of projects (Part 5), along with the Plan Vivo standard that places particular emphasis on these aspects.

The carbon standards differ mainly in their eligibility conditions (host country and project activities). The credits issued by these different standards will be traded at different prices on the carbon markets, depending in particular on the social and environmental requirements. Table 1.4 shows their basic differences. For more details, see Lopes, 2009 and Chenost *et al.* 2010.

Table 1.4: Comparison between REDD+ standards
(Source: Lopes, 2009 and Chenost *et al.* 2010)

		Geographical zone	Price of credits	Comments
Carbon standards	**VCS** *(Voluntary Carbon Standard*	Worldwide (provided there is no conflict with regulated carbon sectors at national level).	1.3 to 20€ (average 3.5)	The VCS has a very good reputation among buyers and may become the main standard on the voluntary markets. It provides a number of methodological tools and offers a permanent credit solution *via* an insurance system (see chapters 4 and 6). It nevertheless has some of the disadvantages of the CDM: complex implementation and high transaction costs. Few projects have registered as yet (none under REDD+).
	CAR *(Climate Action Reserve)*	California for version 2.1 United States, Canada, Mexico and Brazil for Version 3		
	CCX *(Chicago Climate Exchange)*	United States or non-Annex 1 countries	0.6 to 10€ (average 2.6)	The CCX is not a high-quality standard (e.g. regarding additionality and permanence) and is therefore intended for projects that do not satisfy these criteria. The very low trading price of these credits should nevertheless be underlined.
	ACR *(American Carbon Registry)*	United States or non-Annex 1 countries		
	Plan Vivo	Developing countries (rural areas)	3.5 to 7.5€ (average 3.7)	The Plan Vivo standard is suited to some types of small-scale forest projects that mainly aim to benefit rural communities. However, studies have pointed out the complexity of the project documents required (scientific approach) and the low quality requirements of some criteria.
Project standards	**CCBs** *(Climate, Community, Biodiversity)*	Worldwide	1.3 to 10€ (average 6)	The CCBs standard is recognized for the social and environmental benefits of forest carbon projects. It is an additional asset for projects, which can be reflected in the credit trading price.
	Social Carbon	Worldwide (only active in Brazil at present)	3.5 to 6.5€ (average 5)	The Social Carbon standard mainly focus on the social component of projects, and may therefore be considered narrower in scope than the CCBs.

3 Project assessment and development guide

When developing and evaluating a REDD+ project, every aspect must be addressed, from the design of activities and methodological requirements to financial feasibility. The mechanism may be broken down into five main components, which are all interconnected:

- The project's REDD+ strategy,
- The organisational component,
- The methodological component,
- The social and environmental component,
- The financial component.

This guide provides specific technical recommendations for each component. A summary of the main elements to be considered are compiled in an analysis grid, attached in Annex 2 of the guide.

Five case studies are also presented in Annex 4: the main project features are described and each study details a particular feature to illustrate the different sections of this guide (Table 1.5).

Table 1.5: The case studies

Name	Location	Project Proponent	Analysis
Protecting A Native Forest	Australia Tasmania	REDD Forests	Carbon finance as an alternative source of income to logging concessions
Sao Francisco Forest Project (formerly Genesis Forest Project)	Brazil	Instituto Ecologica	Evaluating and quantifying the social benefits of a REDD+ project
Juma	Brazil	FAS	Establishing a projected baseline scenario
Oddar Meanchey	Cambodia	Forests Administration of the Royal Government of Cambodia	1. Linking REDD+ and the National Community Forestry Programme 2. *Ex-ante* estimation of project effectiveness
Kasigau	Kenya	Wildlife Works	Estimating forest carbon density

Para Walnut in Brazil © ONFI

Part 2

Recommendations for REDD+ project development:

Determining the project's profile and strategy

Ibi Bateke Project in DRC © ONFI

In brief…

- There is no single type of REDD+ project. They all have the same common objective of trading a quantity of avoided or absorbed CO_2-e emissions on the carbon markets. However, they each deal with specific deforestation and all degradation dynamics and therefore should develop different activities and strategies.
- By definition, the greater the threat of deforestation in the zone, the greater the felling potential. However, some deforestation drivers may, for institutional, financial and/or technical reasons, be difficult to control at project scale. It is up to those involved in the project to determine, beforehand, their strategy for reducing deforestation and degradation in the zone.
- REDD+ activities will not be effective unless they target the agents and drivers of deforestation. Selecting and/or designing these activities will require meticulous prior analysis of current and foreseeable local deforestation/degradation dynamics in the zone.
- The developer should use this prior qualitative analysis, also quantitative as far as possible, as a basis for developing or adjusting the strategy for reducing deforestation. This initial analysis will also be necessary to establish the baseline scenario as well as the initial diagnosis required to assess the project's social and environmental impacts.

The technical recommendations dedicated to REDD+ project elaboration set out the following steps:

1. Definition of the project perimeter
2. Identification and analysis of deforestation agents and drivers
3. Development of the project's REDD+ strategy

1 Defining the project perimeter

The first point to consider in developing a REDD+ strategy at project scale is the location of the project. The perimeter selected for a REDD+ project will depend on many different criteria. The climate benefit is often the main criterion but other aspects also come into play, which may be political (the government's will to act), historical (long-standing experience in the zone, for example) or emblematic (such as the presence of endemic species). Strictly speaking, the project perimeter is the area in which the project intends to act to reduce deforestation. Except in some rare cases, this is not limited to the forested areas eligible for credits but should include areas where alternative activities can be developed in the non-forested zone (see Part 4.3.1 of chapter 4 for the different geographical boundaries of a REDD+ project).

From the point of view of overall additionality, the regions of most interest are those under severe threat of deforestation and which, a priori, would not have attracted any investment for conservation (Miles *et al.*, 2008). In practice, the selection mainly obeys a risk management strategy. The following are among the most important criteria:

- **Criteria relating to the project's long-term carbon potential, in other words:**
  - The existence of forest ecosystems as defined by the UN, without which the project would not be eligible[5].
  - A threat of deforestation or degradation: it would not be relevant to develop a REDD+ project in a zone where no deforestation or degradation has occurred in the past or where no threats are anticipated. A forest area which is completely inaccessible and therefore, in theory, not under threat from human activity in the medium or even the long term does not necessarily need protection[6].
  - The potential for establishing alternative activities, which means the possibility of effectively curbing deforestation drivers at project scale, both technically and from financial and institutional points of view. This would include, in particular, qualification and experience of stakeholders in terms of curbing deforestation drivers that occur in the zone.
  - Interest and support of stakeholders for the project in so far as the project's success depends largely on the long-term involvement of all concerned stakeholders, whether local, national or international. The project perimeter may be defined as the area which is under the control of project participants.
  - The degree of natural risk that may jeopardise the project's permanence, regardless of stakeholders' efforts, is a critical factor.
  - Political, financial and legal security in the country or zone, which should secure the initiative's long-term viability.

5. For consistency with the UN, this is the definition given by the UNFCCC in the Marrakech accords and used by the standards.
6. There could be changes on this point, depending on interpretations of the "conservation and sustainable management activities" in REDD+.

- **The project's financial feasibility, in other words:**
  - Interest from investors is a potentially important criterion in selecting the project zone. From this point of view, social and environmental benefits will increase the financial feasibility of a REDD+ project, since they increase the zone's attractiveness.
  - Political, financial and legal security in the country or zone, which will, a priori, help to secure investment. This particularly concerns projects still in the early stages of development, whose implementation will need early financing. Legal security in this context refers to the rights that are, or may be, exercised in the project zone and over any carbon credits generated.
  - The cost-effectiveness of project activities.
  - Possibilities for generating income other than carbon revenues strictly speaking, which will strengthen the project's financial feasibility (and may also strengthen its additionality and permanence).
  - The project's social and environmental acceptability, if not research of excellence on those issues, which will affect not only the initiative's eligibility for the REDD+ mechanism (see REDD+ non-paper developed in the wake of the Copenhagen summit), but also its long-term impact on climate resulting from local communities engagement, the zone's attractiveness to investors, support from institutions and interest among the different stakeholders.

There is no ideal size for a REDD+ project. All the points described above will have an effect on its size. Given the high transaction costs (see Part 6), developers should always bear in mind that a project where the threatened forest area is too small may not be profitable. Conversely, it is essential to remember that, by definition, the larger the area, the higher the costs of reducing deforestation and project monitoring will be. There is no guarantee that a large-scale project will systematically be more profitable in the long term than a medium-scale project.

2 Identifying and analysing the agents and drivers of deforestation

Identification and analysis of agents and drivers of deforestation are required in all REDD+ projects, to ensure that the dynamics of local deforestation are well understood. This will also contribute to many of the later stages, such as development and selection of project activities, identification of involved stakeholders and determination of carbon credits ownership, as well as development of the organisational chart, forecasting and location of future deforestation, evaluation of the project socio-economical impacts, and development of benefit redistribution mechanisms, etc.
Agents and drivers, both present and future, must be identified as exhaustively as possible. As far as possible, the analysis must be detailed and quantitative.

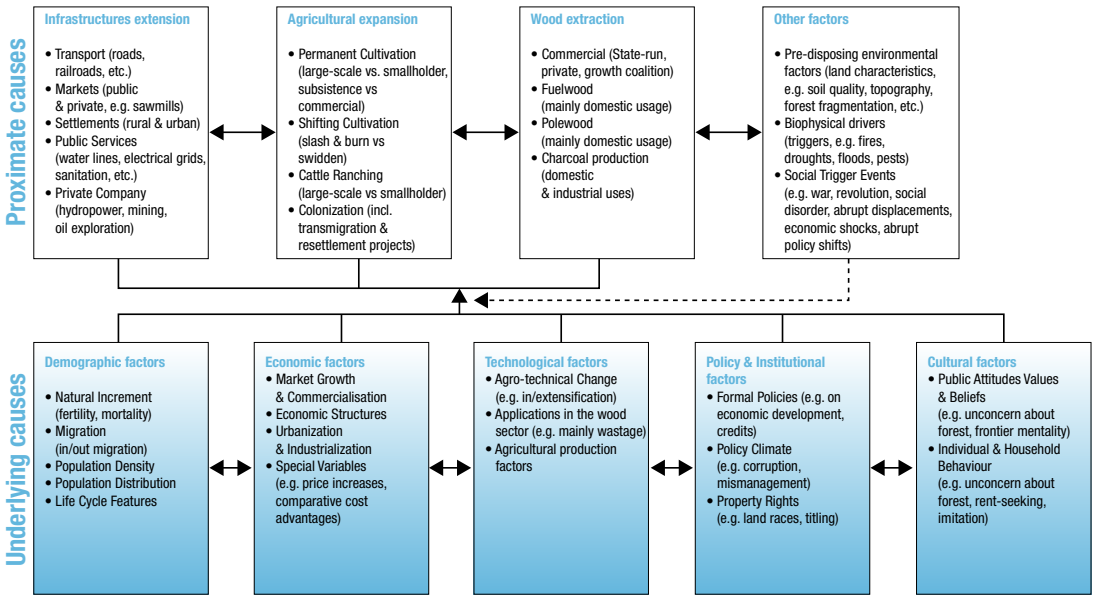
2.1 - What is a driver of deforestation?

Agents" of deforestation must be distinguished from direct and indirect causes of deforestation, or "drivers" (Angelsen and Kaimowitz, 1999 ; Geist and Lambin, 2001):

- The agents of deforestation or degradation are the people who are directly or indirectly responsible for the act of deforestation and/or degradation. Agents of deforestation may therefore be farmers, forestry or mining operators, users of wood and timber resources, governments investing in infrastructure, etc.
- The direct causes are the activities that drive deforestation and/or degradation, and are the immediate reasons why an agent will deforest or degrade forest cover. Subsistence agriculture or cash crops, agro industry, road building, mines, logging and so on are direct drivers of deforestation.
- The indirect (or underlying) causes of deforestation/degradation are the signals that have an influence on direct causes. These may be, for example, an increase in the price of agricultural products, increasing poverty or inability to access energy supplies, unclear land titles (which encourages land grabbing), increased demographic density, economic development policies, etc.

Based on 150 case studies, Geist and Lambin (2001) have drawn up an exhaustive list of direct and indirect causes of deforestation worldwide (see figure 2.a).

Figure 2.a: Direct and indirect causes of deforestation
(Source: Geist and Lambin, 2001)



The identification phase in a REDD+ project must include an in-depth analysis of the relationships between the different agents and direct and indirect drivers of deforestation/degradation. Despite the fact that they are tedious work, descriptive efforts are crucial. They are required by all the standards to draw up the Project Design Document (PDD), as they ensure that project developers are well aware of the issues at stake in reducing deforestation in the project zone.

The VCS methodologies recommend identifying and describing the spatial distribution and future trends in the key variables driving the different agent categories. This stage enables project developers to identify the stakeholders who will have to be involved in the project to guarantee its success, but also to determine the project activities. A good description of agents and direct and indirect causes of deforestation will also help to structure the project strategy, by making it possible to consider, from the outset, the degree of carbon efficiency that can reasonably be expected from the project.

Some indirect drivers that come into play at much larger scales – particularly demographic, political institutional and economic factors (although local incentives can modify the local economic context up to a point) – cannot be curbed effectively at project scale. This is an additional argument in favour of developing national and international REDD+ strategies and ensuring that projects are consistent, and even integrated, with these strategies.

Some agents of deforestation/degradation have an influence on the project zone even if they are not present within it. These must be targeted by different activities and often require political, institutional or economic measures to accompany the project strategy. This is the case with future agents of deforestation in particular.

2.2 - Future agents and drivers

As far as possible and in order to guarantee its effectiveness and additionality in the long-term, a REDD+ project will need to anticipate future agents and drivers of deforestation and try to address them. Those future agents and drivers must be included in the identification and analysis processes described above.

The methodologies that have been submitted to VCS for approval, recommend both analysing how existing agents and drivers of deforestation/degradation may evolve in the future, and anticipating the emergence of new drivers. The reference zone should include these future agents and drivers, so that the baseline scenario can be adjusted throughout the project's lifetime (see Chapter 4).

In most projects, establishing project perimeters as protected areas will prevent new drivers and agents from appearing in the future (see Juma project example in box 2.1). It should also be remembered that the drivers of deforestation/degradation in the project zone must be monitored as well as the project activities. If new causes or new drivers appear, the project activities will have to be adjusted.

Box 2.1 – Anticipating future agents and drivers in the Juma project

The Juma project (see case study in the Annex 4) gives a good example of how future agents and drivers of deforestation can be anticipated.
The activities implemented by the project concern local communities living in the zone. However, the main cause identified, which explains the scale of deforestation in the baseline scenario, is the advancing pioneer front for soybeans and livestock. At the time of project development, this particular driver of deforestation did not exist in the zone. It will become a threat to the forest in the long term, as shown by the projected baseline scenario (see Chapter 4). Classifying the zone as a nature reserve should prevent the emergence of these drivers.

3 Selecting suitable REDD+ activities for a project

Given the diversity of agents and drivers of deforestation and degradation, there is also a wide range of possible activities to address them. Their common feature is that they are designed to reduce deforestation and leakage permanently, while avoiding adverse social and environmental impacts and fostering positive impacts. These activities must be suited to the projects and therefore have to be selected with care.

3.1 - What is a REDD+ activity?

From the economical point of view, REDD+ activities seek to make up the profitability gap between a standing forest and a forest that has been felled or degraded for various purposes. If it is not possible to make up this difference, regulatory levers may be used, but, compensatory measures will need to be implemented in any case to avoid leakage and to ensure that local socio-economic conditions haven't been affected. To be effective, any REDD+ project must propose an optimum combination of activities that act as incentives and activities that act as restraints ("carrot and stick" principle).

There are three kinds of levers, the first two acting as incentives ("carrots") and the third as restraints ("sticks"):

- Increasing the value of a standing forest (whether it is intact, exploited or degraded): this can include ecotourism, income-generating uses of non-timber products, forest certification, payment for environmental services, etc., all of which make it more profitable to preserve the forest.

- Increasing the value of already deforested zones to relieve pressure on standing forests: this can include agricultural intensification, restoring soil fertility, developing new economical field and certification processes for agricultural produces, developing alternative livelihoods, etc. The

goal is to generate additional incomes for the deforestation agents and thus make deforestation less "necessary". However, the design of these activities must avoid any incentive to further deforestation. For example, introducing new agricultural techniques can make deforestation more profitable, and if labour is or becomes available thanks to these new technologies, deforestation is liable to increase. This lever, like the first, can also encourage new populations to settle in the zone and thus increase pressure. Therefore, regulatory measures will generally be required to accompany these activities, in order to avoid driving increased deforestation.

- Restraints may, for example, involve establishing the zone as a protected area or strengthening the control of illegal activities. Restraining levers may be established at national level (obliging government to abide by their conservation and concessions non-issuance commitments) or at local level *via* contracts signed with landowners or users, whereby parties commit to abstain from further deforestation. In most cases, this lever should not be used on its own, as doing so may worsen local living conditions or simply displace carbon emissions elsewhere. Compensation measures must accompany any ban on activities to offer a satisfactory alternative to destructive activities, and effectively enable agents to stop, change or reduce these. These compensatory measures will usually involve the two incentive measures described above and must be designed for long term project lifetime efficiency.

3.2 - Putting drivers and activities into perspective

This first step consists of short listing activities which, in theory and as they target the agents and drivers identified in the zone, have the potential to reduce deforestation/degradation. This perspective is based on an in-depth analysis of the causes and agents of deforestation/degradation.

Beyond project activities identification and qualitative analysis described in the previous section, project developers must attempt to rank the causes of deforestation/degradation according to their impact on past, present and future deforestation. The analysis may also be quantitative, as suggested in the methodology developed by Terra Global Capital and submitted to the VCS, which recommends estimating the impact on deforestation of each individual factor.

By cross-referencing the available quantitative and qualitative data, it becomes possible to identify the drivers to be given priority attention to ensure that the project is effective, those which cannot or should not be stopped but merely curbed (as in cases where impacts are produced by infrastructure development that also improves local socio-economic conditions). For each of these drivers, the corresponding potential levers must be developed, taking their feasibility in the zone into account (social acceptability, required qualification and expertise, etc.).

Table 2.1: Drivers of deforestation and incentives/restraints used in the case studies

Case study	Identified existing and future drivers of deforestation	Examples of incentives in the projects*	Examples of restraints in the projects*
Oddar Meanchey	• Small scale farming, fuelwood collection, wildfires caused by hunting or swidden agriculture, illegal logging, large-scale agricultural or logging concessions	• Clarification of land rights • Land-use plans • Agricultural intensification • Improved stoves • Market development for non-timber forest products	• Clarification and strengthening of land titles
Juma	• Land conversion for subsistence farming, livestock, illegal logging and mining • Future causes: large-scale livestock farming and agriculture	• Incomes generation from sustainable livelihoods • Payment for environmental services • Community education	• Establishment of a protected area • Surveillance and law enforcement
Kasigau	• Subsistence farming and land grabbing by migrant populations	• Alternative livelihoods for local communities • Land titles clarification for local populations	• Clarification and strengthening of land titles • Eviction of migrant populations
Tasmania	• Logging, conversion to plantations	• Substitution of logging income by carbon income	• Development of protection forests and contracts with their owners
Tocantins	• Fire management of crop and pasture lands, urban expansion	• Capacity building for management of non-timber forest products • Environmental education	• Creation of a protected area

*This is not an exhaustive list of examples. It is based on the analysis of available PDDs and/or exchanges with project developers.

3.3 - Estimating the cost-effectiveness of each activity

In theory, several activities can be implemented to address each driver. The choice may be based on a more or less rough estimation of their respective carbon efficiency, in other words their potential to effectively halt or reduce deforestation/degradation. Their carbon efficiency is then compared with the cost of implementing the activity.

Given that one activity can act on several causes, that its success may have an impact on another activity success, that causes interact with one another and

that their influence on deforestation rates is not unilateral or easily identifiable, measuring the effectiveness of a given activity is not an easy matter. Up to now, only the methodology developed by Terra Global Capital addresses this problem (see Oddar Meanchey case study in Annex 4). This proposes to:

1. Quantify the impact of existing drivers on future deforestation,
2. Quantify the impact that each activity may have on each driver (percentage of emission reductions compared to the baseline scenario).

This is a useful analysis, not only to facilitate decisions on the choice of activities but also and subsequently, to define the project scenario. Summing impact of each activity on each cause, the potential effectiveness of all the activities can be deduced. Reference to previously conduct socio-economical studies, project assessments and so on in the project area or comparable zones, can lessen the risk of subjective bias in the activities efficiency analysis.

Another approach consists of using the built up baseline scenario to simulate the impacts of project activities. This has the advantage of including interactions between the different drivers and activities. However, this requires that:

1. the baseline scenario has been built up from a model (and project developers rarely have such models available– see Part 3.3 of chapter 4),
2. the model has been configured to enable testing of various activities under consideration.

Neither of these two approaches is entirely satisfactory. The first could be too subjective and does not easily take into account the inter-relationships between different activities, different drivers and between activities and drivers, while the second is much less feasible. Therefore, project developers still do not have a robust tool to make *ex-ante* estimations of the effectiveness of REDD+ activities. Lessons can likely be learned from *ex-ante* assessments made in other development areas.

Once carbon efficiency of project activities has been appraised, it needs to be compared with their cost in order to select the most cost-effective among them. The cost of activities will depend on the opportunity costs to be offset, the costs of implementing the activity and, to a lesser extent, the transaction costs. Though, those transactions costs can be high in some cases, for example when contracts have to be signed with a large number of landowners. As well as costs, the economic benefits stemming from the activity also have to be taken into account. In some cases and depending on the developer's intentions, these benefits can be substituted for benefits generated by the other activity and ultimately reduce the cost of the project. For example, if an agricultural intensification activity raises incomes and living standards for the targeted populations, it can replace compensatory payments and avoid the need for a system of payment for environmental services.

3.4 - Additional parameters

Other parameters also need to be considered, especially the social and environmental benefits of project activities. Although they are not marketable, they can increase the trading price of carbon credits, for example if they are certified by a dedicated standard (see Part 5). They may also help to secure other sources of finance, such as environmental patronage or cooperation schemes.

The risks arising from implementation of identified activities must also be considered. Some activities may have an optimal cost-effectiveness ratio, but may also carry greater risks and fewer chances of success. A given activity may involve more risk if it requires support from large number of partners, if it has never been attempted before by stakeholders involved in the zone, if it depends on the success of other activities, etc.

On completion of this analysis, performed at the time of the feasibility study, the activities to be implemented will have been identified and designed.

3.5 - Monitoring and adjusting activities

At the end of the first monitoring period, the project's carbon gains compared to the baseline scenario must be measured *ex-post* to give an indication of activity effectiveness. Results are sometimes lower than estimated, either because previously unidentified drivers of deforestation have appeared or because the activities were not optimally adjusted.
Socio-economic studies conducted among the populations should help to understand their reasons for continuing and contributing to deforestation, especially when they apply practices promoted by the project. These studies can then provide deeper insights into the reasons for total or partial failure of the activities and why the goals set *ex-ante* have not been achieved.
So that failure is not discovered too late, ongoing liaison with the agents of deforestation/degradation will help to keep track in real time of the relevance of project activities in terms of their context and how they evolve over time. Should inconsistencies become apparent, the activities should be gradually reoriented or readjusted. Insofar as the local context is continually subject to change and because REDD+ projects are based on forecasts of future deforestation in the zone, it is important to bear in mind that the projects are learning processes and must be responsive and adaptable throughout the project's duration.

REDD in Southern Cardamoms Project, Cambodia © Wildlife Alliance

Part 3

Recommendations for the organisational REDD+ component:

Ownership of REDD+ carbon credits and repercussions for the project's organisational structure

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In brief…

- **REDD+ projects require more or less active participation from a wide range of stakeholders. Consequently, its success will among others things depend on the developer's ability to:**
  - **identify the stakeholders whose active participation and/or support are necessary,**
  - **secure their participation in or support for the project in the long term,**
  - **identify and secure the skills and expertise required for the project to run smoothly throughout its lifetime,**
  - **share roles between those involved and ensure responsive coordination.**
- **Like all forestry projects, REDD+ projects are subject to complex legal and political systems which they will need to adapt to and comply with. Beyond the need for secure land titles to effectively develop project activities, one of the specific characteristic of REDD+ projects is the fact that national REDD+ strategies and the legal framework in which the mechanism will be built up are still being developed and negotiated at international level. Therefore, there are few clear and definitive legal and political references.**
- **In any project, the development of a robust organisational structure is critical to its success. The allocation of titles to carbon credits generated by REDD+ projects largely reflects the project structure, as this will be based on the contributions of the different stakeholders involved.**

The question of carbon credits ownership is fundamental, because only the recognised owner of the credits is entitled to market them (or to appoint a third-party to do so) and to enjoy the benefits of their sale. It must also be remembered that:

- **the legal nature of the carbon credits and whether or not they can be privately owned will have a very substantial impact on the project's financial strategy,**
- **the process of project certification by the standards demands that the question of carbon credit ownership is settled before the project is validated.**

The specific recommendations on organisational requirements for REDD+ projects require developers to:

1. determine ownership of the carbon credits,
2. develop an organisation chart and contractual arrangements

1 Ownership of carbon credits

Project developers must answer the question of credit ownership as soon as possible, before the project begins. This is fundamental to project development and to its success in the long term, and necessary to allow trade in the credits. Who will be entitled to sell the carbon credits generated by a REDD+ project? Answering this question requires several stages of analysis:

1. determine the legal nature of the credits and whether or not they can be privately owned,
2. identify all parties likely to claim rights over the credits, if these can be privately owned,
3. in parallel, determine the most appropriate distribution of credits and designate the most suitable owner(s), who will therefore be responsible for the credits,
4. develop and sign contractual arrangements whereby all identified rights-holders hand over their ownership and receive compensation for doing so,
5. finally, allow the designated owner(s) to trade the credits, in person or through a duly authorised third party, *via* an Emission Reductions Purchase Agreement (ERPA).

1.1 - The legal nature of carbon credits

It is important to understand the legal nature of carbon credits in order to determine the rights and obligations of those who own them and possibilities for transferring the legal title to the credit purchaser. The legal nature of carbon credits also gives an indication to determine who can own the credits, in accordance with the rights and obligations that arise from their production and ownership, including applicable land titles or use rights under current legislation.

• What is a carbon credit?

Carbon credits are essentially accounting units that certify the results of activities undertaken - either qualitatively or quantitatively - in terms of performance or tonnes of CO_2 equivalent. Accordingly, a carbon credit is a title that allows the bearer (the owner who produced it or the purchaser) to, in this case, emit tonnes of CO_2 equivalent, offset tonnes already emitted or offer proof of the environmental performance of an activity.

Carbon credits have different names depending on the standard used (CERs, VCUs, etc.). They are only given material existence - in the form of titles - once they have been registered in the appropriate registry, and therefore after they have been certified.

Carbon credits are sui generis instruments that are (in case of the CDM) or may be (in the case of REDD+) created either by instruments governed by international law or through private voluntary initiatives. However, the legal nature of carbon credits is defined neither under international law (which can only govern legal relationships between States) nor by voluntary initiatives

(which are under private law and cannot substitute the legislator). Given this situation, the matter has to be referred to the most appropriate legal framework, which may be the law applying to credit sale contract or the laws of the host country where the REDD+ activities are implemented.

On the worldwide CDM market, CERs are generally considered as "intangible goods" or "commodities", but also sometimes as financial instruments (when the transaction is effectively a forward contract) or even as a provision of services.
Tangible or not, an "asset" is a good that may be privately or publicly owned. In countries with civil law systems, a carbon credit is akin to an intangible personal good. This is representative of a right that can be freely assigned by its holder, who is thus entitled to transfer it with no public policy restrictions. For the rights-holder, this right of transfer creates a subjective right in a heritage asset (which has a monetary value, in other words a market price) that may be privately owned (including by persons governed by public law for the management of their private assets).
However, and by virtue of national laws in the host country, carbon credits may also be akin to rights over a natural resource (stored/avoided carbon).

The carbon markets have gained a certain amount of experience in carbon credit transactions. However, transactions in REDD+ credits are still very infrequent, and pending clarification of the mechanism at international level, they occur exclusively on the voluntary markets.

Credits generated by REDD+ activities cannot be handled in the same way as those from afforestation and reforestation activities under the CDM, since these activities differ in ways that have to be reflected in legal provisions. In some legal systems, it is considered that carbon sequestered by afforestation and/or reforestation is an "industrial" fruit. By analogy, carbon not emitted thanks to activities that aim to avoid deforestation or degradation (i.e. avoided emissions) may be considered as a "natural" fruit, which is only indirectly the result of human activities.

Projects for afforestation or deforestation that are eligible for the CDM also generate credits that certify carbon removals and which may be either "temporary" (and must be replaced when their validity expires) or "long-term". REDD+ projects generate emission reductions that should, subject to the outcome of the international negotiations under way, be much more akin to the certified emission reduction units generated by non-AFOLU CDM projects, except if afforestation and reforestation activities are also part of a national REDD+ strategy. This does not affect the voluntary offset market, where the standards allow their own accounting units to be issued.

• What are the issues?

It is the legal nature of a carbon credit that determines the rights and obligations of its owner and possibilities for the owner to transfer the legal title to a purchaser. It therefore substantially determines the project developer's strategy. The fact that a carbon credit is considered as an asset, a service or a natural resource is what enables a private player (investor, developer, user or landowner) to claim ownership of the carbon credit and trade it on the market.

• Applicable national laws

In order to ascertain the legal nature of a carbon credit, the project developer must first of all check whether carbon credits are legally characterised under national law in the host country.

Many industrialized countries purchasing carbon credits have legally defined the nature of carbon credits[7], but this is not necessarily the case in project host countries, whether the projects are already eligible for the CDM or may become eligible for any future international REDD+ mechanism.

If there is no legal definition in the host country, the legal nature of the carbon credits will be decided on by the project stakeholders. They have to decide on the legal nature they consider most appropriate, in particular to identify the owner(s) and to guarantee - assuming that a contract is signed transferring the credits to a third party - that the vendor may validly transfer the legal title on credits to the exclusive benefit of the purchaser, with no objection possible from any third party.

The sale agreement does not need to mention the chosen legal characterisation, which will be implicit from the contractual arrangements made between buyer and vendor in accordance with the legislation governing the contract (in the vendor's country, i.e. the host country, or in the buyer's country). Since the legal nature will be established by project participants themselves without specific law clarification on those issues, this will only result in a presumption of credits ownership, which may be supported by additional factors stemmed from the conditions of project development and implementation, in order to further secure the transaction.

Finally, for ongoing projects, it is important to keep a close check on changes in the legislation of host countries where REDD+ legislation could be developed that provide a framework for the national strategy and bring it into substantive effect through projects, but also that definitively and legally qualify carbon credits.

In order to determine the legal nature of carbon credits where no legal characterisation exists under a specific law, it is therefore essential to:

- Keep a close check on developments regarding the government's position on the legal nature of carbon credits. In terms of REDD+, although the preparations made by countries and the documents submitted to the FCPF or UN-REDD do not always give clear information, they do provide insights on the national context.
- Refer to applicable national laws (on natural resources, civil law, legal obligations, land titles, etc.) relevant to the legal characterisation of carbon credits, i.e., essentially forest, trade and land title legislations.
- Keep up an open and ongoing dialogue with project participants and local and national authorities in preparation for bringing carbon credits to the market.

It is recommended to seek advice from a suitably qualified lawyer in the field of forest carbon projects who is also familiar with the legal context in the host country.

7. For example, a definition of CERs has been included in the French Environment Code (Article L.229-22), characterising them as movable assets.

1.2 - Carbon credit ownership

If the law of the host country does not identify the owner(s) of carbon credits, but if - by analogy with other existing instruments - they can be characterised as being privately owned, then it is possible to determine the owner(s) on the basis of several criteria or indications. Some standards demand proof that titles to the carbon credits have been duly attributed (see Box 3.1).

• Determining the ownership of REDD+ carbon credits

Theoretically, in a national approach, the government should concentrate the ownership of emission reductions and consequently act as the contracting party for the buyers, while stakeholders with real rights (landowners, usufruct and customary rights holders) lose all claims to the ownership of non-emitted carbon and therefore of the carbon credits.

If a country decides to introduce a domestic system for market-linked REDD+ projects, the position would then be closer to current practice observed under the CDM. The government could decide that the holders of ownership rights are the project developers, subject to distribution among all stakeholders within the project perimeter.

In this context, voluntary market projects are something of a special case since they could be excluded from a national REDD+ strategy. In this case, project developers would be responsible for distributing credits ownership rights amongst themselves.

It is important to understand that carbon credits ownership depends crucially on the legal traditions of the host country (civil law or common law) and on a whole series of legal issues that are specific to each project and to its location (linkages between modern and customary laws).

Two key questions must be answered to determine who owns the carbon credits:

- **Who has rights over the lands where the trees are growing, over the trees themselves and over their fruits?** Traditionally, a fruit goes to the owner of the asset which produces them (trees, in this case), in accordance with the right of enjoyment (*fructus*), which is one of the three pillars of property law. However, they can also go to those who only have a usufruct right. That being said and in some countries, the law can specify that certain use rights over plantations do not cover sequestered carbon. It is important to take land titles into consideration, including recognised (and duly registered) customary rights and resources use rights, including those enjoyed by concession holders, according to whether they exercise their rights in such a way as to contribute to carbon sequestration or emission reductions.
- **Who contributes to the production of carbon credits (i.e., who provides inputs allowing the project to take place)?** Contributions in capital or industry that have enabled carbon to be sequestered or emissions reduced should be taken into consideration. If there are no legal rules on the allocation of carbon credits ownership, it is possible to share and distribute ownership in proportion to the contributions

or efforts made by the different parties involved in the activity. In this context, relinquishing real customary rights or resource use rights may be considered as a contribution.

Box 3.1- Carbon credit ownership issues in the certification process

Among the different standards that certify REDD+ projects, some require that arrangements have been made to secure carbon credit ownership by the time of project validation and registration. Obviously, this is the case for standards that allow credits to be generated.

- Until January 2010, the Voluntary Carbon Standard (VCS) required developers to supply documents establishing their rights on emission reductions or removals and their ownership of the project. The criteria have changed somewhat, because since 21 January 2010, the documents required must supply documented proof that irrefutably establishes developers' use rights (and not ownership) in the emission reductions or removals. This use right is understood as an unconditional, uncontested and unmortgaged right to claim that the project will generate, or has generated, such reductions or removals.** These use rights can stem from the legislation or be recognised by a competent authority. They may also result from proof of rights over the sources or sinks that will generate emission reductions or increased removals.
- Among its eligibility criteria, the American Carbon Registry (ACR) requires project developers to provide, before registration, documentation and certificates of title to all the credits. The legal titles must be clear, unique and uncontested. The standard does not specify that the titles must be established to the project developer benefit, but requires proof that the matter has been settled. Developers must also prove that the intended emission reductions or removals increase will result directly from the project, which means that they must own or control the sources or the sinks. For a REDD+ project, this effectively means that the project developer must be the owner or must control the forests under threat of deforestation or where deforestation is to be reduced.*
- The Plan Vivo standards stipulate land title criteria (Box 3.3) but does not mention ownership rights over the carbon or the carbon credits.

* ACR, Forest Carbon Project Standard, version 1. March 2009
**http://www.v-c-s.org/docs/VCS-Program-Update_21JAN2010.pdf

Project participants also have to agree on the result of their respective contributions: carbon sequestration/emission reductions, and/or production of carbon credits certifying such carbon sequestration/emission reductions, and/or potential to sequester/reduce during the project entire crediting period.

Contributions may be different in nature: capital, land or industry.

• Capital contributions

As long as financing contributed, directly or indirectly, to a reduction in emissions compared to what would have occurred if the REDD+ project had not taken place, and regardless of the project phase financed by the investor or donor, this capital contributions can support claims to the ownership of at least some of the carbon credits.

The number of credits that can be claimed depends on the amount that has been invested and must be decided after negotiating with other project participants. There are no rules on this point. Not all investors or donor will want to act upon their credits ownership. In that case, their relinquishment must be contractually translated. The type of finance must be agreed on (donation, investment, forward credit sales, etc.), as well as the products expected by the investor or donor.

Box 3.2 – Land tenure in REDD+ project perimeters

(Various sources, PDDs and communications from developers)

Project name	Tenure issue and Project Approach
Kasigau	Government owned lands with recognised lease rights held by Rukinga Ranching Co. Ltd. Local and migrant communities are identified as agents of deforestation. They have no legally recognised title to the lands they use or occupy in the project zone and region.
Oddar Meanchey*	State Forest under Forestry Administration authority. Some lands have no recognised title, or their boundaries have never been clearly defined. The main project activity aims to clarify land titles and secure recognition of long-term use rights for the communities.
Sao Francisco Forest Project* (formerly Genesis Forest Project)	Private lands owned by the project developer (Instituto Ecologica).
Protecting a native forest	Private lands. Through an exploitation contract, the owners transfer their carbon rights to REDD+ Forests, the project proponent and developer.
Juma	The lands are owned by the State, which has transferred its rights to FAS for the project's implementation.

* Projects with a draft PDD not yet validated by the CCBs

• Contributions in land – landowners

Projects are implemented on lands that must be made available in order to reduce deforestation.

REDD+ projects may be developed in different types of land that should be distinguished:

- **The zone for which credits are allocated (crediting area)**, in other words, the forested lands in which carbon is stored, which are under threat of deforestation (Chapter 2 of this guide) and where carbon valuation is to be generated. In some projects, and depending on the forest cover condition, activities will be implemented directly on those lands to protect or strengthen the value of the standing forest (non-timber forest products, patrols, increased carbon forest stocks, etc.).
- **Lands ineligible to carbon crediting** (for example because they are not forested) and where the project will be acting to reduce pressure on the eligible zone where forests still exist and to reduce deforestation and/or degradation (for example by developing afforestation or reforestation activities, agricultural intensification, restoration, etc.), as well as **installations** that will be modified, created or established (such as improved smoke-ovens). That includes what the recent versions of methodologies are referring to as *Leakage Management Areas*.

In both cases, the landowners will have to make the land available and commit not to exercise their use rights for at least the entire duration of the project. By doing so, they contribute to carbon credits generation and may therefore claim partial ownership. Controlling carbon sources or sinks where carbon emissions reduction or removals increase is to be valued, is critical to the project's viability. Some standards require that before the project validation, tenure would have been clarified (if not secured), on at least part of the lands (Box 3.3).

In the forestry sector, ownership is rarely absolute. In many cases, it is on the contrary dismembered, allowing people other than the landowner to enjoy real rights over the land surface or substrate, or on the installations that are used to carry out the project. This is referred to as the right of enjoyment, and usually applies to trees and fruits (such as carbon) without invalidating land ownership itself.

In most tropical countries, forests are construed as belonging to the public domain. The state may then grant resources use rights to public or private entities for a given period. Depending on the terms of these agreements, concession holders and owners may both claim rights over the carbon credits. However, in some countries, the law may specify that some rights to use plantation resources do not cover sequestered carbon (as in the case of Brazilian concessions).

Beyond rights over the soil, the surface or the substrate, the trees or the fruits, the fact that an effort is made to contribute to the reduction of deforestation should be considered to decide how carbon credits ownership will be shared. In eligible lands, these efforts often involve forgoing an activity, a benefit

or a use of resources in order to reduce pressures on forest areas. Those **relinquishment efforts** made by landowners and/or use rights holders are an important issue of REDD+ projects. These efforts may give them rights over part of the carbon credits that will be generated by the project, depending on what would have been agreed upon between project participants.

Box 3.3 - Land titles and the certification process

• The **VCS** requires the PDD to be provided along with supporting documentation on use rights in credits (Box 3.1). Unless such rights are excluded by recognised rights, they are taken by the VCS as a potential result of the rights, awarded under contract, of ownership or enjoyment in the plants, facilities or processes that will generate emission reductions or increased absorption and in the lands, the vegetation and the conservation process. These use rights may also be the result of an applicable and irrevocable legal agreement with the holders of ownership or enjoyment rights.

• Besides proof of title to the future credits (Box 3.1), **ACR** eligibility criteria demand secure land titles. Project developers must provide documents certifying that they own (property rights) or control (rights of usufruct, agreement with the owners and/or holders of enjoyment rights) the lands associated with the project.

• **Plan Vivo** only certifies projects implemented on lands that are owned or controlled by local farmers taking part in the project. The developer must prove that the land rights cannot be subject to any reappraisal that would affect the project's implementation and validity (see Chapter 5).

• If land ownership or use rights are disputed in the project zone, the **CCBA (Climate, Community and Biodiversity Alliance)** standard require the project to explain how it will help to find solutions to clarify the situation and ensure that no unresolved conflicts remain when the project begins.

• Contributions in land – rights of enjoyment

Rights of enjoyment may be recognised by a contract, a law or a custom. They concern lands, vegetation and fruits, or the facilities related to the project. Rights of enjoyment may be rights of usufruct, use, exploitation, tenancy, etc. They may also be rights arising from laws or traditional customs. Particular attention should be given to possible conflicts between modern written laws and customary laws (which raise specific issues in the case of non recognised land occupancy, see below).

For REDD+, what needs to be analysed first of all are rights over carbon credits that may be claimed in return for relinquishing an initial right of enjoyment. Rights over the carbon credits will be proportional to the lands and/or resources thus frogone.

- **The usufruct right** is the right to use and enjoy movable and immovable assets which are the property of another person (the owner), who is responsible for preserving its substance. The usufruct right is therefore a real but temporary right. In general, the usufruct right is consigned in a public land registry, which helps to identify usufruct rights-holders.

  > If the project prevents them from freely exercising their rights of use and enjoyment, those holding usufruct rights may demand compensation and claim property of part of the credits. Depending on the contract, the usufruct right may also concern forest carbon.

- **Exploitation, logging and sylviculture rights,** etc. give the holder real rights over the trees. These rights are granted for a fixed duration, explicitly or implicitly, in a specific contract or by virtue of wider rights of enjoyment.

  > When a REDD+ project is implemented, it is usually assumed that timber harvesting activities that impact the forest cover condition will have to be ceased or reduced. Those holding exploitation, logging or sylviculture rights, etc. will therefore have to fully or partly relinquish their rights. This gives them grounds to claim compensation, which may be in the form of carbon credits ownership.

- **Tenancy rights** are obtained by signing a lease agreement with the owner or usufruct holder. This agreement concerns only land or facilities.

  > The project's implementation may limit a tenant's rights of access to forest fruits, including industrial fruits, or limit the exercise of these rights. In both cases, the tenant may claim rights over carbon credits.

- **Rights** of use are real temporary rights that give the holder the right to use assets belonging to another person, in the limit of his/her own or family needs. Unlike the usufruct rights holder, the rights of use holder cannot transfer or lease out property that belongs to another. Use rights must be recognised and formulated either in law or in a contract by the owner. They do not affect carbon ownership rights since beneficiaries of use rights can only claims rights over the fruits in kind that they or their families may need. Even when use rights exist, the legal carbon owners remain the landowner and/or usufruct holder.

  > If a user finds that he or she must relinquish rights to use the resource, they may claim compensation in kind, in cash or in the form of carbon credits property. For example, members of a community with recognised rights over timber use may request compensation if they can no longer enjoy this right because of the REDD+ project implementation.

• Legally unrecognised occupancy and use of land

In many situations, identification of land rights holders is complex and land occupancy and tenure issues can cause conflict (Box 3.4). Landowners and holders of enjoyment rights may claim ownership of at least part of the carbon credits and, if they prefer or in the absence of an ownership right may require compensation for relinquishing the exercise of their rights. What would be the

situation in the case of populations who occupy and/or use forest lands with no legally recognised rights to do so?

Box 3.4 - REDD+ project and land tenure insecurity

Although the determination of REDD+ credits ownership depends on the recognition of land tenure rights, developers must realize that in many developing countries, land tenure remains a very sensitive issue. It is often difficult to identify the owner of the forest, either because there is no clear registered titles or because several people can legitimately claim ownership over the land. Rights of enjoyment are still more complex, especially customary rights, which are rarely recognised in law and even more rarely enforced (Larson et al. 2008).

Depending on regions, a small proportion of tropical forest areas are being transferred from state to private or community ownership (IRR, 2010). In 2008, in the 25 largest forest nations, 74.3% of the forests were designated as state property, as against 80.3% in 2002 (Sunderlin et al. 2008). In many situations, states do not recognise customary rights claimed by forest communities, and conversely, many forest communities reject state control over forests they consider to be theirs (Sunderlin et al. 2008b). What impact does this have for deforestation and for REDD+ projects? And especially, what impact do REDD+ projects have on land tenure insecurity among forest communities?

Land tenure insecurity has long been associated with deforestation (Sunderlin et al. 2008b). According to the land degradation-deforestation hypothesis (Angelsen and Kaimowitz, 1999), farmers will invest less in land to which they have no long term title, soil quality will rapidly deteriorate and farmers will tend to cut down another tract of forest for cultivation. On the other hand, forest conversion often enables, in both customary and modern laws, to establish or confirm rights over lands (Angelsen 2009). In that case, deforestation becomes a means to obtain a title to the land. But securing land titles can also increase conversion for commercial uses, which in some cases will weaken forest communities who are already very poor and vulnerable (CDB/IUCN 2010).

REDD+ opportunities and forest carbon valuation in general, are liable to exacerbate land speculation. Efforts to clarify land tenure could also benefit states or private companies and exclude communities who depend on forest resources and are often identified as local agents of deforestation. Conversely, the REDD+ mechanism could be used to finance the implementation of sustainable community forestry systems. In some projects, activities intended to clarify land tenure rights for the benefit of local communities are promoted as a means of effectively reducing deforestation.

In some cases, this issue is a very critical one whose repercussions far exceed legal aspects. Populations who illegally occupy or use the land usually

contribute to deforestation. They are identified as agents of deforestation and their illegal activities are often their only means of subsistence. If the project intends to generate carbon credits, these populations will have to put an end to their practices. Should the fact that they have no recognised right to use the land deny them any compensation right for the effort they make by forgoing their use?

If no rights exist, communities will have no legal claim to carbon credits or compensation, but this does not prevent project developers from granting compensation, including compensation for strategic reasons.
It is important, in this respect, to note that:

- From the point of view of additionality and regardless of the legality of their occupancy, it is out of the question for a project to evict populations occupying the lands for subsistence without offering alternative resources, as this would merely shift their activities elsewhere and cancel out the project's climate benefits.
- Depending on the factors being considered, clarifying land rights may be seen as either an encouragement to deforestation or, on the contrary, a means of reducing deforestation (Box 3.4).
- The absence of legally recognised rights for local communities is often the result of gaps in forest governance: either the legislation does not exist or is not enforced. Some projects give legal rights to communities in the project zone or its surroundings, in the hope that doing so will reduce deforestation (for example the Oddar Meanchey project in Cambodia, which uses the REDD+ mechanism to enforce the country's community forestry measures – see detailed case study in Annex 4).
- Some standards will not accept projects implemented in lands where use conflicts exist.

In practice, apart from certain principles in the so-called "safeguards" of the Copenhagen REDD+ "non-paper", there is nothing to encourage project developers to compensate populations who abandon their illegal use or occupancy of forest land. And unless project developers agree to the constraints of special certification demanding a positive social impact of the project, nothing can force them to adopt a socially responsible approach. In brief, using or occupying lands with no legally recognised right to do so does not give any grounds for claiming ownership of carbon credits.

• Contribution in industry

Reducing deforestation involves contribution from a wide range of stakeholders, each providing their skills, time or resources, whether human or material. In return for contributions in industry, the different stakeholders may claim ownership of at least some of the carbon credits. If they prefer or in the absence of recognised ownership rights, they may claim compensation for their participation.

Identifying the different industry contributions requires a good grasp of project implementation procedures and proper identification of each active participant. In theory, the organisation chart will provide the necessary information for identification, and will clarify the issues arising from each player's participation in the project.

A priori, all active participants may claim credits ownership in proportion to their participation in the project. For example:

- Contributions in expertise and competences, for points requiring specific technical expertise. This is the case for the development and validation of a PDD or methodology, for project managing and brokering, etc.
- Contributions in kind that refer to human or material resources that would be provided to ensure that the project runs smoothly at all times during its development. An example would be a local government authority allowing the project to use its teams, vehicles, seeds, etc.
- Active participation, which means actually taking part in carrying out the project. For example, local communities may become involved in the project in various ways, by accompanying project teams, taking part in monitoring activities, enrichment planting, boundary marking, etc.

For all of these industry contributions, stakeholders can claim ownership rights over part of the carbon credits generated. In practice and for many validated or under validation projects, the proponent is designated as the carbon credits owner (Box 3.5) and offers compensation to other players in return for their contributions.

Box 3.5 - Who owns REDD+ credits?

(Various sources, PDDs and information communicated by developers)

Name	Credit owner
Kasigau	The project developer and financer - Wildlife Works Inc.
Oddar Meanchey	The Forestry Administration (owner of the land), which committed to pay 50% of the net benefits to the local communities (who hold a right of enjoyment). Terra Global Capital covers its financial and industry contribution (methodology development/validation and marketing of the credits) by recovering 7% of the credits generated.
Genesis Forest Project	The project developer, Instituto Ecologica, who pre-sold the credits to its partner Carbonfund.org, who itself has signed an agreement with Hyundaï, the project financer.
Protecting a native forest	REDD+ Forests that develop and finance the project
Juma	The project developer - FAS that sale it to Marriot Hotels (that is also financing the project).

2 Developing an organisation chart and the necessary contracts

Whether they are landowners or usufruct holders, whether they are active project participants or contribute to it by relinquishment efforts, whether they are legally or customary recognised parties, anyone with a claim to carbon credits ownership should *de facto* be considered a project stakeholder. There may be others, who have to be identified and included in the project organisation chart.

As explicit in its name, the organisation chart shows the project's organisational structure in the form of a diagram. It clearly identifies the role that each stakeholder will have in developing and conducting the project. It also clarifies the relationships between stakeholders and identifies those for which a contract should be established in order to ensure – on the longer-time and as far as possible – the project success and carbon credits ownership security.

• Identifying project stakeholders

Any individual, group of individuals, organisation or system that has or may have an impact on, and that is or may be affected by the running of the project, should be considered as a project stakeholder. Not all of them will necessarily have a claim to carbon credits ownership, but they must all be included in the project's organizational structure, and the issues arising from acceptance or non-acceptance of the initiative must be well understood for each of them.

Box 3.6 -
Consultations with stakeholders in the CCBA certification process

The need to conduct effective consultations with stakeholders and publish project documents and results it is mentioned several times in the CCBA standards, which gives the following definition:

"Effective consultations depend on (…) providing information for all community groups and other stakeholders using socially and culturally appropriate methods. Consultations must include all genders and generations. The venue must be agreed to by all concerned and the consultations must involve representatives chosen by the communities themselves in accordance with their own procedures. All stakeholders concerned by the project must be able to assess its impacts and express concerns as to possible negative effects, formulate the results they want to see and contribute to the project design, before finalisation during implementation."

Source: *CCBA, Standards 2nd Edition, 2008*

Identifying the project stakeholders is a fundamental prerequisite whose importance is not limited to legal or organisational aspects; it will be more or less critical, depending on each situation. Provided that the process does not prove too much of a burden, it will always be worthwhile to do this exercise as it will clarify and facilitate the different tasks involved in conceptualising the project, identify and analyse deforestation agents and drivers, assess the project's socio-economic impacts, manage risks, etc.

Project stakeholders are of two types:

- *De facto* stakeholders are those who live in, work in or have an influence on the project zone or region, whether the project is implemented or not.
- Specific stakeholders that will have to be drawn into the project, in addition to de facto stakeholders, in order to ensure that all expertises required for its success are gathered.

REDD+ projects stakeholders will obviously differ from one project to another. Usually, they will include:

• Local communities; • Farming, logging and hunting groups; • Private-sector businesses; • Locally established and active NGOs; • Government institutions and authorities; • etc.	***De facto* stakeholders**
• Consultancies, research groups, development NGOs; • Technical and logistic players under contract; • Investors; • Brokers; • etc.	**Specific stakeholders**

The larger the number of stakeholders, the more complex the project structure will be. In some cases, it may be useful and even necessary to divide them into distinct groups, according to specific project variables (profile, potential influence, proximity to the zone, impacts on the forest, vulnerability, etc.)

The international *Social Analysis Systems2* initiative offers a number of methods and processes to identify, analyse and classify project stakeholders. These, as well as case studies, are available from the initiative's web site:
http://www.sas2.net/tools/social-analysis-techniques/actors

The main risk involved in identifying stakeholders is that some may be left out, because they have not made themselves known or because the process didn't locate them. By multiplying methods, this risk can be reduced in order to ensure that the project is not jeopardised by parties that would have been omitted. Also included among those methods are the identification by experts or by stakeholders themselves, public meetings, descriptions of the context by stakeholders already identified, checklists[8], presentations and availability of project documents to attract comments from the public, effective consultation with stakeholders (Box 3.6), etc.

• Analyzing stakeholder interests

To avoid organisational risks, developers also need a good grasp of:

1. the technical and logistic capacities and capabilities required to develop, implement and run the project (an environmental protection group, for example, may not necessarily have enough expertise and experiences to successfully implement community-oriented activities. Conversely, an NGO specialised in local and community development may not have the necessary forestry and carbon expertise);
2. the government processes, authorities and decision-making institutions in the forestry and commercial sectors in general, as well as in the carbon credits and REDD+ markets when existing (for example, foreign investment is usually regulated and sometimes requires the creation of holdings or local partnerships. See also articulations between the project and the national REDD+ strategy, part 1.3 of Chapter 1);
3. the way project's implementation will affect the different stakeholders and their expectations regarding the project.

Beyond the identification itself, the point here is – by analysing all the different interests, claims and ethical or legal rights – to improve the understanding of the dynamics of deforestation versus conservation as well as the processes involved in implementing the project. The work carried out should identify any synergies, trade-offs or conflicts of interest (whether pre-existing or potential), as well as the potential roles and responsibilities of each stakeholder in the project.

Methods borrowed from the social sciences are particularly useful in complex natural resource management situations (Grimble, 1998) that frequently arise in REDD+ projects:

- transversal systems and interests scales (e.g. a REDD+ project developed at the scale of a watershed basin, a province, a management unit, etc.) ;
- a resource sought after by several users, for different purposes with sometimes conflicting aims (which is effectively the case in a REDD+ project designed to substitute carbon valuation for a destructive use of forest;
- a zone where land titles are not clearly defined or demarcated (see Box 3.4);
- situations of extreme poverty and of political under-representation of peoples.

8. A checklist for stakeholder identification is proposed in Annex A in Chevalier, J.M. (2009), SAS²: http://www.idrc.ca/fr/ev-133058-201-1_TOPIC.html

Among the methods that exist, one example is the so-called CLIP method (*Collaboration and Conflict, Legitimacy, Interests, Power*), which is designed to define the profiles of parties by cross-referencing factors of power, interest, legitimacy and existing relationships (of conflict or collaboration). This method describes characteristics and relationships of each stakeholder and identifies conflict and organisational opportunities[9].

• Developing the project's organisational structure

Developers usually need to start thinking about the organisation chart from the earliest project stages (identification), but it will not be finalised until all stakeholders (including deforestation agents) have been identified and analysed and the project activities selected and described. The organisation chart often provides the first coherent overview of the project as a whole.

This overview is necessary to:

- determine optimal structural conditions for the project,
- clarify which parties are involved in the project and among those, which may influence its success or failure in any way,
- clarify the functions and roles of all parties involved,
- locate existing and potential areas of conflict,
- identify organisational weaknesses, structural risks and sources of problems that may not be immediately apparent.

There are no strict rules for the development of a REDD+ project organisational structure, but the following points should be noticed:

- a stakeholder may have several different roles at once (for example, a consultancy may be commissioned by the project owner to run the project while also providing technical assistance);
- conversely, a particular role may be performed by several different agents;
- if they are functional and as far as possible, it is preferable to use existing organisational structures that stakeholders are familiar with (such as forestry management units);
- recruiting a local stakeholder to perform a predefined function which they already understand or for which they will have been trained is often a better solution than importing external competencies (monitoring by local communities, for example).

The main difficulty in developing an organisation chart is that it has to include every important aspect of the project's structure, i.e. political considerations and factors of influence, financial aspects, factors arising from the transfer of competencies and services, etc. Each of these aspects is represented by different kinds of flows from one party to another. Representing all of these flows and all stakeholders on a single diagram often makes it difficult to understand. Some developers prefer to use several specific diagrams rather than a single overall diagram (for example, an institutional and governance diagram + a carbon transactions diagram + a technical and financial organisation chart). This will depend on the complexity of the project.

9. Chevalier, J.M. 'SAS2 1.0: Social Analysis CLIP,' in *Social Analysis Systems2* 1.0, http://www-sas-pm.com/

• Contracts establishment

Analysing and cross-referencing the organisation charts will enable the identification of relationships between parties that need to be translated into contracts. These contracts should secure stakeholder contributions and the benefit sharing among them, and finally, secure carbon credits ownership. Owners will then be clearly defined so that an Emissions Reductions Purchase Agreement (ERPA) can be signed with the credits purchaser.

Upstream from project development, some relationships will not require contracts as more or less binding written agreements may be sufficient between project participants (such as a Memorandum of Understanding or negotiations Term Sheet prior to contract finalisation) and the host country (such as letter of non objection).

In all cases, bringing these relationships under contract will ensure that all parties agree to the organisational structure and guarantee their commitments:

- The contract will clarify the legal situation and facilitate the future credit trading process by designating a small number of owners. It is also possible that – without relinquishing their ownership rights – the different stakeholders agree on one of them (or a third party) to represent all of them when selling the credits. In the Oddar Meanchey project in Cambodia for example, the Forests Department acts as the trader on behalf of the local communities.

- If those involved in the project relinquish their rights over the credits, the contract should establish compensation rules. This may be a share on benefits earned from the credits sale or compensation in kind or in services, depending on the contributions and needs of each party.

- Agreements with agents of deforestation must be considered with particular care, including if the agents are indigenous populations. In such cases, success will depend on their acceptance of the project, which must therefore be to their immediate and long term advantage. Although they should be drawn up separately from contracts for carbon credits, these agreements are by no means of secondary importance.

- Benefits sharing may depend on the amount of benefits earned from the sale of carbon credits and may depend entirely on its success. In that case, the different parties can include a clause requiring the designated owner of the credits, who will be their future trader, to proceed with the sale in accordance with the best existing practices.

- Contracts should also include clauses applying in the case of non-execution of contractual obligations that may cause the loss of carbon stocks (problem of permanence).

• Credit sales contracts

CDM projects credits' sales contracts reveal that most transactions are over-the-counter (OTC) sales on the primary market, established well ahead of the project's development or implementation, and even before it is validated by a

standard so that it will provide project proponents with an additional source of financing or collateral for bank loans.
The transaction model could be different in the case of REDD+, depending in particular on the approach that will be adopted by the host country.

The CDM transaction model presupposes the existence of a legal relationship, which is effectively a contract for the purchase of certified emission reductions (Emission Reduction Purchase Agreement - ERPA). ERPAs are designed to manage the relationship between the seller and the buyer, and to set out the conditions governing this relationship, subject to the proper execution of the project itself.

Standard contacts are existing and are sometimes available for free on Internet[10]. It should however be recognized that each contract is unique in the sense that it relates to a specific project and takes its particular characteristics into account, as well as any commercial and non-commercial risks arising specifically in the host country.

An ERPA must specify:

- The parties to the agreement, i.e. the purchaser and the seller;
- The seller's responsibilities should the credits not be issued;
- Conditions for the delivery of credits;
- The sale price of the credits;
- Whether the credits are sold directly or through an intermediary.

Each of these points is explained in detail in Chenost C. *et al. Bringing Forest Carbon Projects to the Markets*, 2010.

10. On this point, the CERSPA initiative provides free access to a simple contract model which can be easily adapted to different situations - www.cerspa.org

Part 4

Recommendations for the methodological REDD+ component

Methodological issues of REDD+ projects

REDD Project in Southern Cardamoms, Cambodia © Wildlife Alliance, ONFI

In brief…

- **Particular attention has been given to a number of methodological aspects that were among the arguments against non-inclusion of tropical deforestation in the Kyoto Protocol. These concern:**
  - **The demonstration of the project's net positive impact on climate, designed to guarantee that emissions with the project are lower that if the project had not existed (based on the conservative estimate principle), and that this would not have been possible without carbon financing (additionality).**
  - **Management of leakages, which requires demonstration of the fact that deforestation has not simply been shifted to a different zone in the country.**
  - **The guarantee that emission reductions achieved, thanks to the project, will be permanent.**

- **The REDD+ mechanism is still a relatively recent field and these methodological issues have not all been satisfactorily resolved. However, existing methodologies submitted to the VCS for validation offer several possibilities to address these issues.**

- **The purpose of this component is to draw attention to key methodological points that must be addressed by project developers, and to ways projects have developed to address some of these points.**

- **Particular attention must be given to the complex question of the baseline scenario, which is used to estimate the project's impact on climate and its economic and financial viability.**

For this analysis of REDD+ projects methodological aspects, the following steps will be examined in detail:

1. Establishing the methodological framework of REDD+ projects
2. Demonstrating their impact on climate in the long term
3. Predicting future land-use changes
4. *Ex-ante* estimation of emission reductions
5. *Ex-post* estimation of emission reductions

1 Establishing the methodological framework of REDD+ projects

1.1 - Scope of the REDD+

A REDD project is a project that reduces carbon emissions due to deforestation and forest degradation. The 2007 Bali Declaration also mentions "conservation, sustainable forest management and increased carbon stocks in developing countries" (REDD+), which was confirmed at the Conference of the Parties in Copenhagen in December 2009. It has not yet been clearly determined whether afforestation/reforestation activities will be included in the REDD+ mechanism or addressed under the forestry CDM. These negotiations concern the national level, but the potential scope of REDD+ projects considered into national strategies has been broadened. However, existing standards and methodologies do not yet explicitly provide operational application of these concepts at project scale (except in the case of sustainable forest management introduced through projects for improved forest management under the VCS standard, or projects to increase carbon stocks by maintaining forest areas that absorb carbon and would have been felled in the baseline scenario). These methodological guidelines therefore focus on avoided deforestation and degradation.

Deforestation refers to an enduring change from a forested state to a non-forested state caused by human activity. To be eligible for the REDD+ mechanism, the zone must have satisfied the criteria defining it as a forest for at least 10 years (VCS, 2007). The definition of a "forest" to be used by the project is the definition used in the host country[11]. This is because, to facilitate accounting and ensure its consistency with the national registry (insofar as REDD+ gives priority to the national scale – see Part 1.1 in Chapter 1), it is important to use the same definition for all REDD+ activities undertaken in a given national territory.

When the host country has not chosen a definition, the VCS recommends using the FAO definition (minimum area of 0.5 ha, 10% forest cover at least 5 m in height) (VCS, 2007). The main question that then arises is how to manage the potential risk of a change in the forest definition during the project's lifetime. Assuming that a country has not yet chosen a definition, and the project chooses to use the FAO's definition, the VCS guidelines do not specify whether the definition used by the project can change if the country eventually establishes its own definition. Among those submitted to the VCS for validation, the methodology developed by Terra Global Capital specifies that the forest definition cannot be changed during the project, which implies that the host country has already chosen its forest definition. The FAS and BioCF methodologies, on the other hand, do allow for a change in forest definition during the project. Risks arising from a change in definition must be taken into consideration by project developers and/or investors; the definition chosen by the host country could be less favourable than the FAO's definition. One

11. For definitions of forests in different countries, see http://cdm.unfccc.int/DNA/index.html

way of avoiding the risk, if there is no national definition, might be to choose a definition based on the 3 most unfavourable criteria, to make sure that avoided emissions are not over-estimated. However, this is not allowed under the VCS standard (which recommends the FAO definition), although it is acceptable under the Plan Vivo and ACR standards.

There is no specification (or associated methodologies) on the definition of forest degradation to be used for the different standards. Project developers are therefore advised to use the IPCC guidelines (2003) as a basis. These allow degradation to be defined as an enduring loss of a percentage of the carbon stocks of a wooded area, even if this area still satisfies the criteria defining it as a forest for the purposes of the project. In practice, a degraded zone will be classified as a forest stratum that has lost carbon density. The exact definition of degradation varies and will therefore depend directly on the performance of the technological instruments (remote sensing, field inventories) used to distinguish between the different forest strata according to their carbon density (the methodology developed by TGC for the Oddar Meanchey project illustrates this point).

1.2 Existing methodologies

• Review of REDD+ methodological tools provided by the standards

Table 4.1 shows how REDD+ methodological aspects are treated by the different standards (at the time of publication of this guide).

The remainder of this document is based on the methodologies submitted to the VCS, insofar as they are the most recent (and therefore include progress made in REDD+ negotiations) and the most detailed. When the standards refer to other approaches, this will be mentioned.

• Activities included in REDD+ methodologies

The VCS (2008a) sets out three main types of eligible REDD activities, which differ in the level of planning and spatial pattern of deforestation and degradation processes:

- *unplanned, frontier-type deforestation and/or degradation:* this concerns previously remote areas where human activities were relatively undeveloped and/or limited to the pioneer front. In these cases, deforestation and degradation are essentially the result of improving access to the forest for populations (by road building for example).
- *unplanned, mosaic-type deforestation and/or degradation:* deforestation and degradation occur in a mosaic pattern that usually reflects the fact that the entire forest area is accessible to human activities (farming, infrastructure, etc.). The activities are distributed fairly uniformly in the landscape. The main drivers of deforestation in these zones may be population pressure and/or soil degradation forcing people to cultivate ever larger areas.
- *planned deforestation:* in this case, the conversion of forested lands to non-forested lands is legally authorised and documented. There must not

only be proof that deforestation is authorised in the zone but also that it will actually take place. Planned deforestation may be associated with programmes to move populations to forested zones, with the conversion of state forests into productive lands (agricultural or other), for example. Other types of planned deforestation may include decisions made by individual owners or communities to convert their forests into farmland (provided that their lands are part of an agricultural zone defined by a zoning plan, for example). In the case of individuals, any deforestation of degradation activity could theoretically be considered as planned, but this is difficult to demonstrate. Proof is nevertheless necessary to avoid increasing the risk of deforestation by landowners.

Table 4.1: Treatment of REDD+ methodological aspects by the different standards

Standard	Treatment of REDD+ methodological aspects
VCS	• 5 REDD methodologies submitted for approval • 4 IFM methodologies submitted for approval (see table 4.2 for details)
CCBS	• Guidelines provided in the general section and the climate section (baseline scenario, *ex-ante* estimation of emission reductions, leakage, monitoring plan) • References to CDM tools, IPCC guidelines 2006 and/or stricter and/or more detailed methodologies
Social Carbon	• Prior certification by a standard certifying credits (the list of accepted standards will be published shortly), which means that the specific methodological points are those of the other standard
Plan Vivo	• Each project must provide a technical document of specification addressing additionality, the project's carbon impact, monitoring, assessment of permanence and leakage. Existing methodologies may be used and the document must be reviewed by an external expert before validation by the Plan Vivo expert panel. It must also be submitted for approval every five years • Three technical specification documents, to be attached to projects, have been made public, of which two have already been validated
ACR	• Accepts VCS methodologies (and also CDM, EPA Climate Leaders, WRI/WBCSD GHG Protocol, if these eventually concern REDD activities)
CCAR	• The official version 3 of the standard, shortly to be published, should include REDD activities as well as a dedicated methodological section (a provisional version is available at: http://www.climateregistry.org/resources/docs/protocols/project/forest/forest-revisions/draft-forest-project-protocol-december-2008.pdf)
CCX	• A REDD methodology is currently under development

Planned degradation, under the VCS, is treated as *Improved Forest Management* (IFM). This concerns only areas where felling is authorised for timber, pulpwood or fuelwood. Management practices described as IFM are as follows:

- moving from conventional logging to low-impact logging;
- changing logged forests (or forests that may be logged if carbon finance is not an option) into protective forests;
- increasing the rotation age of forests managed as even-aged stands;
- converting marginal forests into highly productive forests.

When different types of deforestation/degradation coexist within the same project zone, forest strata must be identified by type, and different methodologies applied to each tier.

Box 4.1 – Why the distinction between planned/unplanned and mosaic/frontier deforestation?

Levels of planning

In cases where deforestation is planned, the reference situation is less hypothetical and may be justified by planning documents, which greatly simplifies matters methodologically, especially for the development of the baseline scenario. Leakage issues are treated differently, because in the case of planned deforestation, leakage management mainly involves making sure that the management of other areas controlled by the agent has not changed. With unplanned deforestation however, this is more difficult to control in the sense that agents can theoretically move anywhere in the national territory.

Spatial patterns of deforestation

The *Avoided Deforestation Partners* methodology addresses mosaic and frontier deforestation but does not distinguish patterns that are specific to one or the other, although some modules may mention specific features, whereas other methodologies have been developed for specific circumstances. However, our analysis shows that the difference between the two cases does not necessarily justify the development of specific methodologies. The main differences are the drivers of deforestation and the activities that will need to be implemented to address them and avoid leakage. The baseline scenario can be historic in a mosaic zone, but this will be less coherent in a frontier zone (although a historic approach could be used with a reference zone in which similar processes have taken place, or to keep to the conservative estimate principle). In the ADP methodology, the location of future deforestation in a “mosaic” area does not have to be given (provided it is considered that deforestation will begin in zones with the lowest carbon density), but this is mandatory for frontier-type deforestation.

• List of REDD+ methodologies

At the time of publication of this guide, nine methodologies answering to the description of REDD+ methodologies (as understood in the negotiations) have been published. These are briefly described in Table 4.2.

Table 4.2:
Brief description of REDD+ methodologies submitted to the VCS

Name	Activities	Pilot projects*and/or case studies
REDD (VCS definition)		
Methodology for Estimating GHG Emission Reductions in Mosaic Deforestation (BioCarbon Fund)	Unplanned mosaic deforestation	"Ankeniheny - Zahamena" biological corridor*
Methodology for Estimating Greenhouse Gases Emission Reductions in Frontier Deforestation (IDESAM, FAS, CDI)	Unplanned frontier deforestation	Juma *
Baseline and monitoring methodology for project activities that reduce emissions from d eforestation on degraded land (Terra Global Capital LLC, Community Forestry International Inc.)	Unplanned mosaic deforestation and degradation (+ assisted natural regeneration activities up to 30% of emission reductions)	Oddar Meanchey*
*REDD Methodology Framework** (Avoided Deforestation Partners)*	Unplanned mosaic and frontier deforestation and degradation Planned deforestation	Kasigau
Methodology for conservation projects that avoid planned land use conversion in peat swamp forests (Infinité Earth)	Planned deforestation in peat swamp forests	Rimba Raya*
IFM (VCS definition)		
Proposed VCS methodology for Improved Forest Management : Improved Forest Management through extension of rotation age (Ecotrust)	Increased rotation age in forests managed as even-aged stands	-
IFM methodology : estimating greenhouse gas emission reductions from planned degradation (Carbon Planet Limited)	Conversion of logged forests to protective forests	-
VCS Proposed Methodology for Improved Forest Management : Conversion of Low-productive forests to High Productive forests (Face the future)	Conversion of marginal forests to highly productive forests	-
Improved Forest Management - Logged to Protected Forest Methodology (GreenCollar Climate Solutions)	Conversion of logged forests to protective forests	-

* Here "pilot project" is referring to projects based on which or for which a methodology is developed while "case study" refers to the projects described in Annex 4 to this guide.

** The "REDD+ methodology framework" should be distinguished from other methodologies insofar as it is a combination of materials that can be used as required to build up a methodology for a particular project, without requiring further validation by the VCS.

2 Demonstrating long-term impacts on climate

2.1 - Additionality

Like other carbon projects, a REDD+ project must demonstrate that it is additional, which means that the project would not have taken place without the creation of carbon value *via* carbon credits. The standards propose a number of tools to assess project additionality (Table 4.3).

Table 4.3: Tools recommended by the standards to address the additionality question

Standards	Recommended tools
CDM afforestation/ reforestation (A/R CDM)	The project must satisfy all 4 of the following criteria: 1. Carbon credits sales are critical to the decision to implement the project; 2. At least two land-use scenarios can be identified, one with the project and the other without; 3. An investment analysis demonstrates that the scenario with a REDD+ project is economically less attractive and/or a barrier analysis demonstrates that barriers to investment or institutional, technological, cultural or ecological barriers related to current practice, to social conditions or to land issues, prevent the implementation of project activities. It must then be demonstrated that selling carbon credits will overcome these barriers; 4. A test of common practice shows that there is no similar project generating carbon credits in the project zone*.
VCS	Three possibilities: A/R CDM tools, tools specific to VCS methodologies or tests supplied by VCS 2007.1 (project test, performance test, technology test) At present, the methodologies propose adaptations of the A/R CDM tool to REDD, to complement the tests set out in VCS 2007.1.
Plan Vivo	A/R CDM Or a demonstration that the project is not supported by external commercial or legislative interests + identification of financial, technical, institutional, ecological, social or cultural barriers, plus other proof that the activities would not have taken place without the project + possibilities for conducting a common practice test to reinforce the analysis
CCBS	A/R CDM, other tools (economic analyses or barrier analysis or common practice test, etc.)

* This tool is available at: http://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-01-v2.pdf

As well as being additional, the project must effectively bring emission reductions to the so-called *business as usual* level, which assumes that the emissions with the project will be lower than emissions without the project and that leakage does not cancel out the emission reductions associated with the project.

Box 4.2
Demonstrating additionality can be difficult…

Demonstrating additionality is not always easy, for example:

• If the project activities are provided for by law: the project promoter must then be able to prove that the law is not being complied with in the sector in question, for example because the state lacks law enforcement capacity. Encouraging projects of this type could lead to the undesired effect of not strengthening state capacities and would not encourage any spontaneous change in illegal behaviour. The project should anticipate that a national REDD+ strategy may be implemented that would strengthen state capacities, thus making the project non-additional. A project where the baseline scenario is based on the continuation of illegal activities will need to be vigilant on this point.

• If the project itself or other projects in the zone have been receiving funds from sponsors or cooperation: in this case, it does not pass the common practice test and the developer will need to demonstrate that the funds received by the project (or others in the zone) no longer exist and that there is no other source of financing to continue the activities apart from the sale of credits on the carbon market.

2.2 - Net changes in emissions

To have an impact on carbon emissions, the project activities must actively reduce deforestation and degradation in the project zone, and it must be possible to make sufficiently reliable estimations of these emissions, both *ex-ante* (in order to assess project feasibility) and *ex-post* (to generate carbon credits after verification).

The effectiveness of project activities in regards to emission reductions will depend on:

- a good grasp of the causes of deforestation (present and future);
- the definition of project activities in accordance with the *ex-ante* estimation of their impact on deforestation;
- the capacities of project participants to implement these activities.

This question is addressed in Chapter 2.

Two main methodological tools are used to estimate emission reductions (detailed in Parts 3 and 4 from present chapter):

- construction of a baseline scenario that establishes the level of *business as usual* emissions without the project;
- emissions monitoring during the project (also covering any increases in emissions specifically caused by project activities), which should also indicate the project's long-term positive impact on climate.

2.3 - Leakages

The project will only have a net positive effect on climate if emissions due to leakages are lower than the emission reductions the project is able to achieve.

Leakage risks refer to an increase in emissions arising from the project but which occur outside the project perimeter.
The VCS standard sets out two main types of leakage:

- leakage caused by relocating activities, i.e. when agents of deforestation move their activities elsewhere in the territory;
- market-linked leakage, which occurs when agents of deforestation lower their production in the project zone without pursuing them elsewhere, thereby increasing prices for the products as supply drops and making it more profitable to convert forests for the same type of production in other zones.

Two of the types of leakage described by Auckland et al (2003) may also occur: outsourcing[12] and super-acceptance of alternative livelihood options[13]. These are mentioned only by Terra Global Capital, which considers outsourcing risks as negligible because of its eligibility criteria, but recommends monitoring of leakage associated with super-acceptance of alternative livelihood options as part of the monitoring plan.
In REDD+ projects, the developer must be capable of identifying and quantifying leakage risks, so that measures can be taken to reduce these risks. Existing carbon standards only consider leakage within the national territory (on the assumption that a project will not cause leakage internationally and that in any case it would be incapable of controlling this). There are sometimes cases of so-called "positive" leakage (when the project also leads to a reduction in emissions in other areas of the country, as observed around some protected areas in Brazil), but these are not taken into consideration either.

• Characterising leakage risks

When activities move elsewhere, the leakage risk depends on:

- the mobility of the agents of deforestation: if they are not very mobile, the leakage risk is small and will be easier to monitor (because in theory, it will be located around the project zone). If they are mobile, the risk will be greater and more diffuse.
- opportunity costs: depending on the opportunity costs of alternative livelihood options, it will be more or less easy to provide compensation for any restrictions affecting agents of deforestation.

Where market-linked leakage is concerned, the risk will depend on the deforestation agent's characteristic of *price-maker* or *price-taker* for goods whose production will drop because of the project. Producers are considered to be *price-makers* if their behaviour influences the price of the product in question. Everything therefore depends on the market share that may be affected by the production that takes place within the project perimeter.

12. By *outsourcing* is meant the purchase of goods or the use of services that were previously produced on the REDD+ project site. For example, a logging concession that was felling timber in the project zone may choose to buy timber from other operators to maintain its processing operations, which could increase activities in another zone. *Outsourcing* differs from market-linked leakage in the sense that it is caused by the deforestation agent in the project zone and not by a third party.
13. This type of leakage stems from the new activities proposed by the project. For example, if it introduces activities to improve living standards for the population, this may encourage the population to migrate towards the project zone to adopt practices associated with the project. If the move results in a net decrease in emissions from their activities (between their original zone and their settlement near the project zone), leakage will be positive. If the move results in an increase in emissions, leakage will be negative.

Market-linked leakage only occurs if reduced deforestation in a given zone is not offset by production moving elsewhere.
In general, leakage risks are greater when deforestation and degradation are associated with large-scale agro-industrial or logging activities. In such cases, the opportunity costs of activities in the baseline scenario are high and not easy to compensate through REDD+ activities. These agents are more mobile and capable of shifting their activities to other zones under their control. If this is not the case, and also in the case of large-scale REDD+ projects and highly localised production, there is also a risk that they may become price-makers and that a drop in their production will cause market-linked leakage.

• Quantifying leakage risks

Ex-post quantification of leakage is necessary because leakage must be deducted from the emission reductions obtained by the project. *Ex-ante* quantification of leakage is recommended by the methodologies to determine the potential impact of leakage on the project's carbon efficiency, to define activities that will mitigate leakage[14] and to design a suitable leakage monitoring plan. However, the requirements are much less stringent than for *ex-post* estimations. Table 4.4 shows the approaches given in the literature for quantifying leakage..

Table 4.4:
Approaches in the literature for quantifying leakage

Relocation of activities		Market-linked risks	
For planned deforestation and forest degradation	For unplanned deforestation and forest degradation	Developer's choice (depending mainly on how easily the risk can be quantified)	
Checks and direct monitoring of the deforestation agent planning to cut forests	Definition of a baseline in the leakage zone and *ex-post* estimation compared to observed emissions	Economic model of the national market for the goods in question (whether existing or not) or other relevant methodology E.g.: model of the Bolivian timber market (Sohngen and Brown, 2004) used in the Noël Kempf project.	Use of default values (*leakage credit adjustment*), whose value will depend on the project activities and the carbon content of potentially affected zones.

The VCS only takes market-linked leakage into account when it significantly affects timber production. This can therefore concern IFM and REDD+ activities seeking to act against legal or illegal logging, provided that production is on a large enough scale to have an impact on the national market. However, if no carbon credit is claimed for avoided degradation, market-linked leakage due to a halt in logging may be ignored.

14. NB: Emissions arising from activities to prevent leakage must also be estimated.

• Preventing leakage

Project developers should try to keep potential leakage to a minimum. Leakage management begins from the outset of the project, when the developer will need to ensure that communities involved in the project effectively agree to change their practice. This will require a number of activities to accompany agents of deforestation, which usually combine incentives and contractual obligations:

- **Incentives:** direct compensation or project activities of potential benefit to agents of deforestation (e.g., agricultural intensification, access to new sources of fuel, employment opportunities in services associated with the project, etc.).
- **Contractual obligations:** it is advisable to combine incentives with measures under contract (at individual or community level). The CCBA mentions leakage contracts, whereby agents undertake not to shift their activities elsewhere (e.g., not to exceed a given extraction quota in the case of forest contractors), and to provide the necessary proof in the event of an inspection. The greater the leakage risks, the greater the need for stringent contractual or even regulatory measures, with strict enforcement. These will be all the more important in zones where opportunity costs are high and where project incentives will not provide sufficient compensation.

Box 4.3
Methodological indications for leakages management

• Defining leakage zones

All the methodologies recommend that this should be based on an analysis of deforestation agent mobility, using transparent and verifiable criteria. The Terra Global Capital methodology proposes that leakage zones should be defined on the basis of transport costs and on the most mobile deforestation agent's consent to move elsewhere. This is the leakage zone where emissions arising from leakage will be calculated *ex-post*, as regards "geographically constrained" drivers of deforestation.

• *Ex-ante* estimations of leakage caused by relocating activities in the case of unplanned deforestation or degradation

The different methodologies offer four main options:

1. estimations by the project developer of potential emissions in the leakage zone (ADP, and also TGC, which recommends, for example, analysing the leakage risk arising from activities addressing each driver)
2. using methodologies approved by the CDM Executive Board to estimate leakage (ADP, BioCF)
3. using default factors when non-geographically constrained activities move elsewhere (TGC)
4. using Fearnside's "time discount" approach, in which leakage can be estimated at 40% of emission reductions (FAS).

Some methodologies also indicate that if the project area is in a region or country which has introduced a MRV system for reductions of emissions from deforestation and degradation in accordance with UNFCCC or VCS-approved methods, leakage arising from the displacement of activities should not be assessed, as they are already quantified in the national or sub-national system in place.

• Leakage in the case of planned deforestation and degradation

The VCS methodological guidelines recommend that agents of deforestation should provide proof that their activities have not changed after moving outside the project zone (for example by showing management plans for the other zones).

The CCBA standards (CCBs) suggests that the contract should be signed with deforestation agents so that their activities can be legitimately verified in other zones. However, if verification is not possible, the ADP methodology recommends that the developer should make sure that the area granted to the agent by the state has not increased, in cases where the activity is subject to a concession from the state.

• Managing leakage arising from the activities of agents who are not yet present in the zone

In some projects, the agents of future deforestation are not yet present in the project zone. This is the case for frontier-type projects (Juma for example) or projects in high immigration zones (e.g. Oddar Meanchey, Kasigau). In this case, a high risk of activity displacement should be anticipated, but this will be difficult to quantify. In the Juma project, soybean producers or livestock farmers may well develop activities elsewhere on the pioneer front. In the case of Oddar Meanchey, the local populations are liable to move to other favourable zones.

The ADP methodology addresses two different cases:

- Production regulated by the state. For example, for large-scale soybean production, the producer must have a licence from the state, which only delivers a limited number of licenses each year. In this case, to disregard the leakage risk, it must be demonstrated that the state has not decided to grant more lands since the REDD+ mechanism has been on the agenda (since 26 November 2005 for ADP).
- Production is not regulated by the state (e.g. population migrations). Three options are proposed by ADP (and also in the FAS methodology): (i) using a "time discount" approach, in which it is considered that leakage would amount to 40% of the emission reductions obtained by the project, (ii) proving that leakage is taken into account under a wider REDD+ programme (national MRV system for example) and (iii) permanently reserving a percentage of the credits for transfer to a national programme once this is in place.

In the case of non-geographically constrained deforestation factors, TGC recommends the use of national leakage estimations or default factors associated with each deforestation factor.

2.4 - Permanence: guaranteeing a long-term impact on climate

The permanence of emission reductions depends on:

- human factors: risks in the host country (conflicts, corruption, etc.), risks in setting up the project (contract-related risks, capacities and level of

involvement of project partners, etc.), biophysical risks of human origin (forest fires, etc.);
- non-human risks: biophysical risks (drought, cyclones, pests and diseases, etc.). These factors would also have been present in the baseline scenario.

Emissions monitoring in the project zone and the leakage zone against baseline scenario values, which must also be regularly readjusted, should ensure that the emission reductions will endure, and therefore secure the project's long-term impact on climate.
Table 4.5 shows how the permanence issue is treated by the different standards.

Table 4.5:
Approaches proposed by the standards to guarantee permanence

Standards	Risk management	Credits generated
VCS (2008b)	• Assessment using a tool designed specifically to analyse risks of non permanence and remediation measures • Payment to a "buffer account" of 10 to 40% of the credits generated (required), depending on the level of risk • Verification at a time decided in advance and validated in the PDD and monitoring plan • Credits in the buffer account are cancelled to compensate for any emissions that cancel out the project's climate benefit or carbon credits already issued	Yes
CCBs	• Identification and implementation of risk reduction activities • Use of tools applied by other standards (recommended) • Verification at least every 5 years, since the project is validated for 5 years. Subsequent verifications should be based on a monitoring plan which developers must describe in the PDD or, if they have not done so, which they must undertake to develop in the 6 months following project validation	No
Plan Vivo	• Identification of risks, and • Establishment of a buffer account for at least 10% of the credits (which may be increased by the auditor if necessary), and • Annual monitoring reports subject to the verification required to generate VERs	Yes
CCAR	• Submission of annual monitoring reports, and • Signature of a 100-year Project Implementation Agreement and a commitment to compensate credits if they are not generated, and • Buffer account in accordance with the VCS description (i.e. 10 to 40% of credits)	Yes
CCX	• Payment of 20% of the credits to a buffer account (to be transferred in full to the project if not used by the time it ends), and • Signature of a commitment to conserve the forest for 15 years, and • Signature of a letter of intention to conserve the forest after 31 December 2010	Yes
ACR	• Part of the credits reserved in a buffer account in accordance with the VCS tool, or • Insurance policy for credit replacement, or • Replacement of credits lost with other credits	Yes

It should be noted that permanence is a question that should only be addressed explicitly at the time when the carbon credits are to be sold.

3 Predicting future land-use changes

The baseline scenario gives the level of emissions that would have been released without the REDD project, and against which any emission reductions will be measured. In REDD projects, the baseline scenario has two components:

- one component predicting future changes in land use (which may be positive or negative, given that the predictive method used will be identical),
- one component estimating emissions arising from these land-use changes.

We will be dealing with the second component in Part 4 of the present chapter. This analysis given here is based essentially on the methodologies submitted to the VCS standard, since the other standards have not yet provided any methodological material.

3.1 - The reference zone and reference period

By definition, any baseline scenario is hypothetical: once the project is initiated, it is no longer possible to find out what would have happened in the project zone in a situation where the project did not exist. It is therefore advisable to define a control zone, or reference zone. Similarly, a reference period in the past should be defined, to provide a basis to analyse past deforestation in spatial and quantitative terms and project it into the future.

• Why define a reference zone?

This is advisable for three reasons:

- to demonstrate that the project area is located in a zone which is genuinely subject to pressure from deforestation or forest degradation;
- to update the baseline scenario once the project has begun;
- to provide a statistically more reliable basis for predicted deforestation (the larger the zone, the more reliable the prediction is assumed to be, regardless of the method used);
- to obtain data on future land uses that are predicted in the project zone but do not yet exist.

Defining a reference zone is not essential in the case of planned deforestation (for example if the agent of deforestation is able to provide a management plan and justification for past practice in the zone concerned).

Apart from the reference zone, the methodologies, currently in validation process under the VCS standard, set out two further geographical boundaries for REDD+ projects:

- **The crediting area**, which covers the area eligible for REDD+ carbon value. This covers all the forested areas within the project perimeter and demonstrably under threat of deforestation or degradation. These areas are usually divided into strata according to the type and condition of the forest,

but must all satisfy the UNFCCC definition of a forest. These are the zones where the project will attempt to reduce deforestation and degradation or increase carbon stocks;
- **The leakage area**, which is the geographical zone to which deforestation agents and causes may move following implementation of the project.

• How should the reference zone be defined ?

The reference zone covers both the project perimeter and the leakage area before the project begins, but not after it has begun. Defining the reference zone must not be taken lightly, as it will have a considerable influence on the reference scenario calculations, both *ex-ante* and for *ex-post* adjustments of the baseline scenario. The methodologies recommend the following criteria to define the reference zone:

- **Similarity with the project perimeter:** it means similar agents and drivers of deforestation, biophysical factors (which may have an impact on accessibility), infrastructure and policies or regulations that affect land uses. For example, protected areas should not be included in the reference area if the project perimeter does not, or will not, include protected areas. But they should be included if, for example, a project activity is planned to create a protected area, in order to capture the effect of doing so on efforts to prevent deforestation. Similarly, the reference zone should be located in the same administrative unit as the project perimeter, or should at least be covered by the same policies, and so on. The reference zone should include the same deforestation drivers that exist in the project perimeter, and also those likely to appear, such as the construction of a new road or encroachment by large ranches.
- **Size:** orders of magnitude are given by Brown et al (2007) and mentioned for indicative purposes (i.e. not mandatory) in the FAS and BioCF methodologies. Terra Global Capital sets out the minimum criteria that must be satisfied if the developer wishes to use this methodology[15]. The April 2010 version of the ADP module (Avoided Deforestation Partners) requires the size of the reference zone to be calculated with a formula including the size of the project perimeter and several predetermined coefficients.
- **Existence in the reference zone of another VCS-validated project:** if the project perimeter is located in the reference area of another project validated by the VCS, then the reference area used (and the baseline scenario) should be the same as in the first project.

As with the crediting zone and the leakage zone, it is only possible to define the reference zone once the drivers of deforestation have been analysed for the project zone and in a comparable zone (potential reference zone), and after cartographic analysis of biophysical factors and accessibility. The reference zone is obtained by means of iterative calculations, based on the boundaries chosen, to determine whether the criteria of similarity to the project zone are satisfied or not (e.g. similar average road density between the project zone and the reference zone, etc.).

15. According to Brown *et al.* (2007), for projects covering more than 100.000 ha, the reference zone should be 5 to 7 times larger than the project zone, and 20 to 40 times larger for projects covering less than 100.000 ha. The orders of magnitude are smaller in the Terra Global Capital methodology: the reference zone should be twice as large as the project zone when the project zone covers more than 100.000 ha, and up to 20 times larger than the project zone when it covers less than 25.000 ha.

• The reference period

A reference period must also be defined: it is the period in which the data on drivers of deforestation and land use maps must be obtained. The methodologies recommend that at least three land use maps should be used, covering a period of 10-15 or 3-15 years prior to the start of the project. The length of the reference period will depend on discontinuities in the deforestation process that may have appeared in the past (i.e. phenomena that have caused a drastic change in the deforestation process), because a reference period beginning after the change will be more relevant. The number of land use maps required will depend on how uniform deforestation has been. The more variable the process in time and space, the more maps will be required.

3.2 - Estimating past land use changes

For estimations of past land-use changes, the methodologies all refer to the 2009 GOFC-GOLD report. They recommend the use of medium-resolution satellite images, supplemented if necessary with high resolution images. Once the satellite images for the reference zone have been obtained, the next stages are as follows:

- **Pre-processing:** this refers to the preparation of satellite images for analysis *via* geometric corrections, georeferencing, and detecting and eliminating clouds and shadows. Depending on the zones and classification techniques, radiometric corrections and topographical standardisation may also be necessary.
- **Segmentation and classification:** changes may be detected after or before classification. The latter is less costly and more accurate, since the focus is only on the zones where change has occurred and there is no error for zones where there has been no change. For classification purposes, it is advisable to use at least the six IPCC land-use categories (forest areas, croplands, grasslands, wetlands, human settlements and others).
- **Analysis:** calculation of the areas associated with each land-use change in the project zone, the leakage zone and the reference zone. The different estimations must be given together with uncertainty values.

This approach as a whole must be transparent and well documented so that each monitoring stage can be replicated using a comparable methodology.

3.3 - Estimating the quantity and location of future deforestation

To build up the baseline scenario, both the quantity and location of future deforestation must be estimated.
Although the most decisive factor in calculating the baseline scenario is the estimation of all areas where deforestation is anticipated, their location is also important to translate these areas into emissions.

• Qualitative analysis of future trends

A comparison between historic rates of deforestation and assumed future trends will determine whether the deforestation trend will be upward,

downward or steady. This initial qualitative analysis is crucial to the choice of the methodological tool to be used and to understand and justify the results obtained in the next stages.

• Calculating deforested areas

Table 4.6 shows the approaches recommended in the methodologies to calculate future deforestation.

Table 4.6: Approaches suggested in the methodologies to estimate the quantity of future deforestation

	Suggested approaches
Planned deforestation	Use the agent's management plan or the historic rate in the reference zone
Unplanned deforestation, with a regional scenario validated by the UNFCCC or the VCS	Two options: - Use the regional scenario (ADP, BioCF, FAS) - Demonstrate how far this regional scenario is more relevant than a scenario developed specifically for the project (TGC)
Unplanned deforestation, without a regional scenario validated by the UNFCCC or the VCS	Three options: - Averaged historic deforestation rate (BioCF, FAS, ADP, TGC) - Continuation of a historic trend – linear regression or not dependent on the time factor (BioCF, FAS, ADP, TGC) - Modelling (BioCF, FAS) If a steady or increasing rate of deforestation is predicted: adjustment of the deforestation rate according to biophysical and infrastructure constraints*.

* In theory, this adjustment is not always necessary when a modelling approach is used, as some models will be able to take these constraints into account.

The case studies analysed in this Guide have mostly used historical approaches. Only the Kasigau and Juma projects have used modelling. However, in one case the approach is based on a simple linear regression between population density and the deforestation rate, while the other has used a previously developed national model (see case study on the Juma project in Annex 4 for more details).

The methodologies offer relatively few recommendations for implementing modelling approaches since there are a great many possible models of varying

degrees of complexity depending on situations. Whatever the model used, it will need to be calibrated and validated against historic data to demonstrate its accuracy in capturing past phenomena. Well-documented and conservative assumptions as to changes in deforestation drivers should be used and the model must be transparent and peer-reviewed.

Predictions of future deforestation were widely studied in the 1990s. The research conducted brought out the following lessons: (i) building up a relevant model requires substantial human and financial resources; (ii) it is highly improbable that a model will be able to predict the future, since by definition it can only reflect a partial view of reality; (iii) to bring a model closer to reality, it has to be adjusted on a very regular basis, which is costly in both human and financial terms. Consequently, the use of models (other than a multiple regression) at project scale is realistic only in cases where (i) a model already exists, or (ii) a long-term partnership can be established with a research institute or specialised consultancy capable of building up and subsequently updating the model. Given that the time needed to build up a model is unlikely to fit in with project developers' schedules, and given available financial resources in the different stages of the project, one solution that could meet these constraints would be to develop a model during the first five years of the project, leading to a readjustment of the baseline scenario at the time of the first verification. In the development of national REDD+ strategies, national modelling capacities could be strengthened and synergies forged between the different scales.

• Estimating the location of future deforestation

To estimate the emissions arising from the estimated quantity of future deforestation, the project developer must be capable of identifying the strata where deforestation is expected to take place. However, there are two cases where this may not be necessary:

- if the crediting zone includes only a single forest stratum.
- in the case of mosaic-type deforestation, if the developer decides on a conservative approach where it is considered that deforestation will initially occur in the most carbon-poor strata.

To predict the location of future deforestation, it is advisable, whatever the methodology used, to build up a deforestation risk map of the project zone, which will indicate the likelihood of deforestation in each pixel compared to the others, based on spatial characteristics (biophysical criteria, proximity to infrastructure, etc.). Well-proven tools exist to build up approaches of this type, the most frequently cited being GEOMOD, Land Change Modeler and Dinamica Ego. It should be noted, however, that some models are capable of estimating the quantity and location of deforestation, which allows retroaction between these two components to be taken into account, but these are too complex for the tools just mentioned and have never been used for REDD+ projects to date.

• Checking and readjusting the baseline scenario

All the methodologies recommend a readjustment of the baseline scenario at least every ten years to coincide with verification.

Monitoring and updating the baseline scenario requires *ex-ante* development of:

- A plan for monitoring changes in forest cover in the reference zone;
- A plan for monitoring the predictive component of future land-use changes in the baseline scenario. This will depend on the variables used to build up the baseline scenario. The more variables are used, the more costly readjustment will be. One way of reducing the cost would be to develop baseline scenarios for larger regions, where several projects are running;
- A plan for monitoring changes in carbon stocks in the project zone in cases where credits are claimed for avoided degradation or increased carbon stocks.

Project developers are advised to be conservative in predicting their future carbon emissions, since readjusting the baseline scenario will show whether these have been over or under-estimated. It is always more prudent to underestimate future emissions, to avoid the risk of overestimating the project's economic returns.

Box 4.4: Linkages with the national baseline scenario

Ultimately, the REDD+ mechanism is conceived as a national mechanism to be implemented with national methodological tools, such as a national baseline scenario in particular.

The methodological approaches used in project scenarios may not be identical to the national approach insofar as the situations are different: the effects to be captured differ between the national and project levels, and different methodological approaches may be relevant. However, consistency between the two scales will need to be ensured on several levels. Even if countries have not yet specified how national and project scenarios will be linked in terms of methodology, a number of points should be observed to ensure consistency between the national and project scenarios (when the project perimeter is not in a zone for which a sub-national scenario recognised by the UNFCCC or the VCS already exists):

- the approach should be transparent
- this approach should be conservative: the sum of the baseline scenarios built up for the project reference zones must be lower than in the national scenario (although this assumes that the entire territory is covered and that project reference zones do not overlap).
- The data used, whether past or future, should be identical or consistent with those used at the national level, except where generating specific data is justified by the change in scale.

A discussion has begun within the VCS to develop new guidelines to facilitate linkages between sub-national and national REDD+ projects and programmes. These guidelines should help to avoid the risk of overlapping reference zones (and therefore of presenting different baseline scenarios for the same region) when projects in the same region are working independently from each other. In this context, one of the options under discussion would be for project reference zones to coincide with administrative boundaries (provinces, districts, municipalities, etc.).

4 *Ex-ante* estimation of emission reductions

The baseline scenario component will determine probable land use trends in terms of area. The next step is to quantify these changes as carbon equivalents, given that one carbon trading unit is equal to one tonne of carbon dioxide equivalent (tCO_2-e). Also to be addressed at this point will be the activities proposed by the project, since the net benefit of the GHG emissions reductions generated will be the difference between the baseline scenario and the project emissions.

4.1 - Basic concepts

• Stocks and flows

The term "emission" can be a source of confusion because it involves two distinct concepts: carbon stocks and carbon flows. Carbon stocks are contained in "carbon pools" (e.g. standing timber, organic carbon in the soil or the atmosphere) while carbon flows are transfers of carbon from one pool to another. Carbon flows are therefore a temporary derivative of carbon stocks. The problem lies in the correspondence between the two measurements, since they relate to different scales in time and space. Measurements of stocks concern larger areas than measurements of flows. Furthermore, flow measurements are instantaneous and may be continuous over time, whereas stock measurements can only be made discontinuously at given points in time.

In practice, the most frequently used approach for biomass is to measure variations in carbon stocks. This covers both carbon stocks and carbon flows, since instantaneous flow measurements are not possible (it would indeed be difficult to find a way of measuring the net carbon absorption of a tree in real-time…). By calculating variations in carbon stocks over time, it is possible to determine carbon flows associated with biomass. This holds true under the assumption that the carbon may be entirely oxidized or decomposed. Other emission flows, such as enteric fermentation in livestock or fossil fuel burning are always flows. The results will then be expressed overall as carbon flows (absorption or emission).

When developing a REDD+ project, the question is therefore to identify the carbon stocks and flows to be taken into consideration in the baseline scenario and the project scenario. These carbon stocks and flows may then be estimated for the project zone and the reference zone.

• Choice of compartments

According to the UNFCCC's May 2009 working paper[16] on the REDD+ mechanism, the compartments to consider as regards carbon stocks are the same as those set out in the CDM: aboveground biomass, belowground biomass, dead wood, litter and soil organic carbon. These compartments are also given in most existing methodologies developed for the voluntary standards; some of the standards also

16. FCCC/TD/2009/01

consider wood products (i.e. what felled forest timber has become). However, these compartments do not all have to be systematically considered. Project developers may choose not to count in one or more compartments, provided that this does not lead to an overestimation of emission reductions and, therefore, a larger number of credits generated by the project. The decision on whether or not to include one or more compartments will depend on several principles and parameters:

- Conservative estimates
- Significance
- Existing information
- Cost-effectiveness of measurements: income from carbon sales must be higher than the cost of measurements. This implies an assessment of the human and financial resources required to make the measurements, including MRV transaction costs.

While carbon flows are concerned, recommendations for the different standards are much more variable. While official texts at present only consider emissions of trace gases (CH_4 and N_2O) released when biomass is destroyed by fire, some of the methodologies proposed for the voluntary standards are much more exhaustive (Table 4.7). However, the same principles should be applied as those used when choosing carbon stocks, provided that the standard in question does not impose any limitations.

Table 4.7:
Carbon stocks and flows considered in existing carbon standards

	Compartment	Activity	GHG	Standard
Stocks	Aerial woody biomass	REDD, IFM	CO_2	All
	Underground biomass	REDD, IFM	CO_2	All
	Dead wood	REDD, IFM	CO_2	All
	Litter	REDD, IFM	CO_2	All
	Soil organic carbon	REDD, IFM	CO_2	All
	Wood products	REDD, IFM	CO_2	VCS, CAR, CCNUCC
Flows	Biomass combustion	REDD, IFM	CO_2 (stock) CH_4, N_2O (flow)	All
	Fossil fuels	REDD, IFM	CH_4, N_2O	VCS, CAR, CCBS, CCNUCC
	Fertilisation	REDD	N_2O	VCS, CCBS, CCNUCC
	Livestock (i.e. digestive fermentation, slurry)	REDD	CH_4, N_2O	VCS, CCNUCC
	Drainage (e.g. peat-bog oxidation)	REDD	CH_4, N_2O	VCS, CCNUCC
	floods (e.g. paddy fields, dams)	REDD	CH_4, N_2O	VCS, CCNUCC

The different carbon stocks and flows described above underline why care is needed in choosing methodological options when developing a project, to avoid any risk of having to include insignificant stocks or flows in the accounts or, conversely, of not being able to optimise avoided GHG emissions. Generally speaking, the idea is not so much to seek exhaustiveness, as to minimise uncertainties and obey the principle whereby a carbon pool cannot be taken into account if it is not a net source.

• Approaches for estimating carbon stocks and flows

The choice of compartments, where this is possible, implies that different approaches should be considered to provide quantitative estimations of carbon emissions avoided thanks to project activities. These approaches involve different levels of uncertainty. For some compartments, the methodologies have clearly established procedures for estimating variations in carbon stocks (e.g. litter – *Tier 3*); for others, the choice between the various approaches is left to the developer (e.g. soil organic carbon):

- *Tier 1*: Use of IPCC default values -> high uncertainty
- *Tier 2*: Improved *Tier 1* approach using national data -> average uncertainty
- *Tier 3*: Specific data based on local measurements and monitoring of these measurements -> low uncertainty

This approach may vary with each compartment and with each stage in project advancement. Usually, when a project begins, few local or even national data are available. A *Tier 1* approach is then used until the project obtains new and more accurate data (or the know-how required to obtain them), during the course of the project. However, it is good practice to give priority to local data when these are available, even in the early project phases.

Choosing one approach over another will have relatively significant consequences in terms of carbon income, given the conservative estimate principle and the uncertainties inherent to each approach. The higher the level of uncertainty (e.g. use of a *Tier 1* approach and multiple compartments, heterogeneous project zone, etc.), the more detrimental the conservative estimate principle will be to the project, in terms of certification of avoided GHG emissions (Figure 4.a).

Whatever the approach chosen (see decision tree in Annex 2), various conceptual tools are available to estimate carbon stocks and flows for the reference scenario and the project scenario. These are given below, in descending order according to how project-specific the relevant procedures are (see figure 4.b):

- Methodologies: procedures for developing, implementing and monitoring projects within a specific project framework.
- Tools developed by the CDM Executive Board[17], which may be used for the REDD+ mechanism.

17. On line on the UNFCCC site: http://cdm.unfccc.int/Reference/tools/index.html

- The IPCC guidelines on which the methodologies are based: procedures for estimating all types of GHG emissions or absorption in a non-specific context and at different scales.
- 2003 *IPCC Good Practice Guidance for LULUCF* (GPG LULUCF)
- 2006 *IPCC Guidelines for National Greenhouse Gas Inventories*, Vol.4. Agriculture, Forestry and Other Land Use.

Figure 4.a: *Tier* approaches and uncertainties

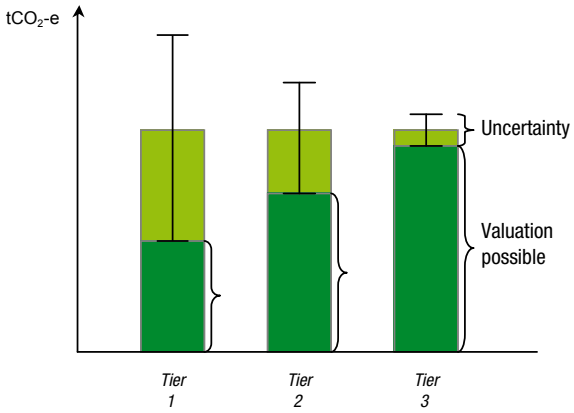
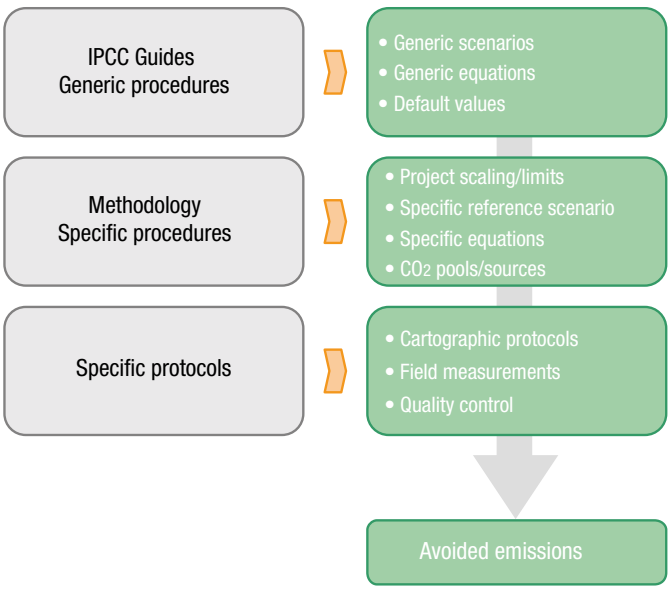


Figure 4.b: Logical framework for the use of data to estimate GHG emissions avoided by the project



4.2 - From theory to practice

Although the IPCC methodologies and guidelines offer procedures and methods for calculating GHG emissions avoided, they do not give the exact protocols needed to obtain, in practice and in the field, the data to be used for the calculations. The choice of protocols is therefore left to project developers, who must nevertheless bear in mind that:

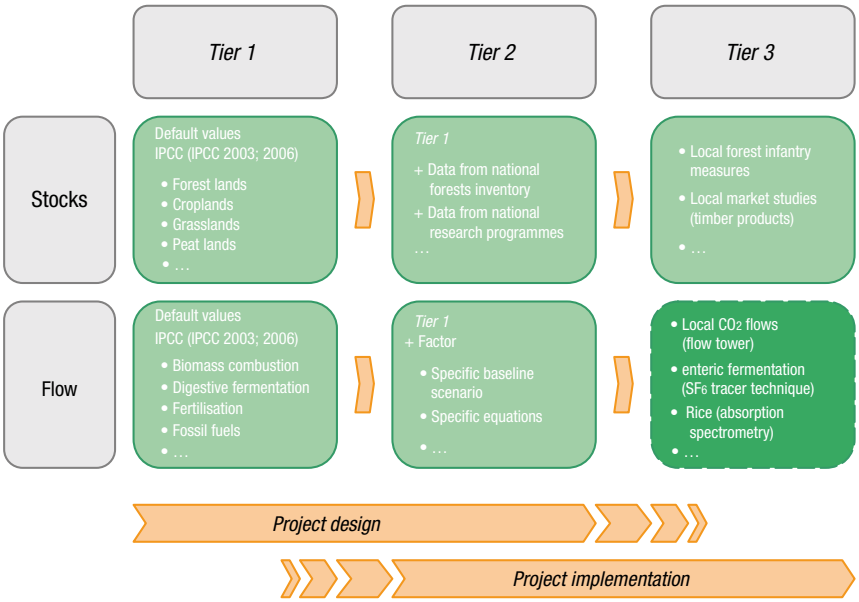
- The protocols used must be compatible with national practice so that field measurements can be capitalised at national level, and vice versa. Prior assessment of national data will be essential in this case.
- The protocols must follow IPCC directives
- The protocols must be adapted to the methodological options chosen for the project (e.g. carbon compartments and flows considered, sampling method)

As well as the points mentioned above, the protocols are also based, where carbon stocks are concerned, on forest inventories. However, these do not suffice to estimate all carbon stocks in accordance with the IPCC directives, since conventional forest inventories do not take certain compartments into account (soil, aerial biomass other than tree trunks, root biomass, litter and dead wood). Nonetheless, there is now abundant scientific literature on techniques for measuring carbon stocks, including the following references:

- MacDicken K.G., 1997. *A Guide to Monitoring Carbon Storage in Forestry and Agroforestry Projects*. Winrock International Institute. 91 p.
- Ravindranath N.H. and Ostwald M., 2008. *Carbon Inventory Methods. Handbook for Greenhouse Gas Inventory, Carbon Mitigation and Roundwood Production Projects*. Advances in global change research, Vol. 29. Springer Eds. 308 p.
- Pearson T., Walker S. and Brown S., 2005. *Sourcebook for Land Use, Land-Use Change and Forestry Projects*. Winrock International. 64 p.
- Rugnitz, M. T.; Chacón, M. L.; Porro R. *Guía para la Determinación de Carbono en Pequeñas Propiedades Rurales* -- 1. ed. -- Lima, Peru.: Centro Mundial Agroflorestal (ICRAF) / Consórcio Iniciativa Amazônica (IA). 2009. 79 p.
- GOFC-GOLD, 2009. *A sourcebook of methods and procedures for monitoring and reporting anthropogenic greenhouse gas emissions and removals caused by deforestation, gains and losses of carbon stocks in forests remaining forests, and deforestation.* 197 p.
- UNFCCC technical paper on the costs of REDD+ inventories (FCCC/TP/2009/1)

Although there is abundant literature on carbon stocks, this is not the case for carbon flows, obviously because there is no easy way of measuring these flows directly. In practice, while a *Tier 3* approach could be applied for carbon stocks, a *Tier 2* approach will usually have to suffice for carbon flow estimations (figure 4.c), simply because there is no practical way of measuring, for example, direct emissions from digestive fermentation in livestock over time, or methane emissions from paddy fields, without substantial technological investment. These examples underline the difficulties that project developers have to deal with to measure GHG emission sources for the baseline of project scenario, unless the project can be included in a research programme.

Figure 4.c: Data available to calculate carbon stocks and flows for a project using *Tier* approaches



4.3 - Estimating avoided carbon emissions

GHG emissions avoided thanks to project activities are estimated by comparing emissions in the baseline scenario with those of the project scenario, including leakage:

$$\Delta CREDD_t = \Delta CSR_t - \Delta CSP_t - \Delta CF_t$$

Where:

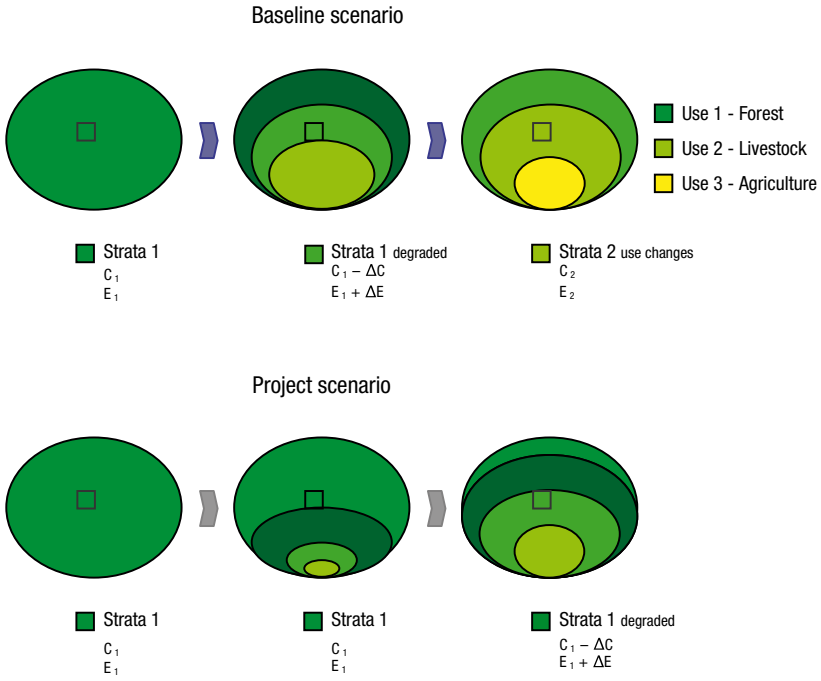
Δ CREDD$_t$:	Estimation of net anthropogenic emissions avoided thanks to REDD+ project activities in year t, tCO2e
Δ CSR$_t$:	Sum of variations in carbon stocks in the baseline scenario in the project zone in year t, tCO2e
Δ CSP$_t$:	Sum of variations in carbon stocks in the project scenario in the project zone in year t, tCO2e
Δ CF$_t$:	Sum of variations in carbon stocks due to leakage in year t, tCO2e

4.4 - Stratify to better reduce

As shown in the equation above, carbon stocks and flows are measured, and subsequently calculated, for each stratum. Stratifying the project in this way, by dividing project and reference zones into homogeneous areas, will limit the number of measurements to be made, for given areas of uncertainty, and thus reduce project costs.

Keep in mind that since the project is compared to the baseline scenario, stratification must be used for each of the scenarios because land-use changes are assumed to be to be different in each one, as shown in figure 4.d.

Figure 4.d: Stratification of the baseline scenario and the project scenario (C: stocks of CO_2-e; E: emissions of CO_2-e)



Stratification is therefore a crucial point as it allows carbon stocks and flows to be allocated to homogeneous areas, so that for any given point, the strata in the baseline and project scenarios can be compared to obtain, by deducting one from the other, the variation in carbon stocks or flows. The difference may be negative (degradation, deforestation) or positive (sequestration). This method is given in all of the methodologies in order to take tree growth and regeneration into account, even in a context of degradation or deforestation - assuming of course, in the second case, that any trees remain.

However, the main difficulty is to accurately determine the surface areas of the different strata in the baseline scenario. There is no simple way of predicting, with any certainty, that croplands will expand in a given direction, and at a given intensity. The methodologies suggest ways of resolving this problem, for example with models, but considerable uncertainties will remain, both for the baseline scenario and for leakages arising from project activities (see Parts 2.3 and 3.3 from present chapter).

As with measurement protocols, stratification must be based on existing data for reasons of compatibility and capitalisation at the national level. Project developers may therefore use the stratification applied in national forest and land-use inventories in general, or in management plans.

5 *Ex-post* estimations of emission reductions

While the methods described above may be used for *ex-ante* quantification of emissions that will be avoided thanks to project activities, project monitoring, reporting and verification procedures (MRV) will provide a much more accurate *ex-post* estimation of the effectiveness of measures implemented during the project.

• What needs to be monitored?

Generally speaking, all the parameters used for *ex-ante* estimations of GHG emissions must be monitored. This means:

- Surface areas by land-use type (per stratum)
- Carbon stocks and flows *per stratum* (biomass and flows arising from uses of this biomass if the project intends to claim credits for avoiding degradation and increasing carbon stocks)
- Leakage
- The parameters used to build up the predicted deforestation component in the baseline scenario (see Parts 3.3 and 3.4 from present chapter)

These parameters must be monitored in both the project zone and the reference zone, so that emissions in each can be compared. The baseline scenario, like the measurements in the project scenario, may then be readjusted.

However, monitoring should not only cover emissions in the strict sense, because it should also ensure that the measures taken are effective in terms of overall project performance. Since the goal is to limit deforestation and/or forest degradation, criteria for monitoring agents of deforestation and/or forest degradation must be assessed. This will require, for example, monitoring of local socio-economic conditions, or changes in local policies and measures and their application.

• When should monitoring be done?

The monitoring intervals for the different parameters provided for in the monitoring plan will vary with each type of parameter and how they change over time in terms of carbon. Flows that can give a direct result in terms of emissions can be assessed much more frequently than stocks that require measurements followed by analysis. Registering fossil fuel burning will be very easy for example, comparing to the number of plots that will have to be inventoried to estimate the carbon stocked in trees.
Another point to be monitored will be the range of carbon variation per compartment, because while an increase or disappearance of biomass is relatively visible, variations in soil carbon are much less perceptible, even after a radical change in land use.

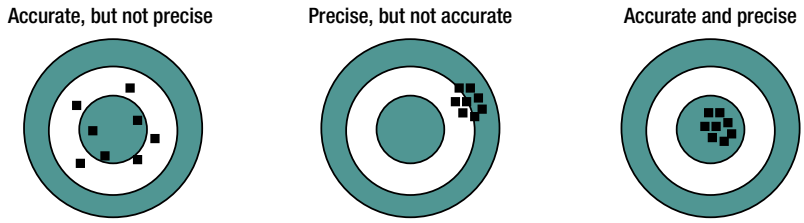
Consequently, monitoring may be annual for some parameters (e.g. fossil fuel or fertilisation) and less often for others. The IPCC methodologies and good practice guides (2003 and 2006) recommend five-year intervals for biomass and up to ten years for soil carbon.

Monitoring of the socio-economic or institutional parameters mentioned above may vary considerably depending on the complexity of the project. For example, a logging concession can be monitored much more rapidly than a project zone where many different local communities are living.

• How should monitoring proceed?

Since the aim is to obtain exact and accurate results, monitoring should proceed, as far as possible within cost-effectiveness limits, in accordance with the *Tier 3* procedure described above. However, it should be noted that few countries, even those in Annex 1, actually use the cumbersome and costly *Tier 3* approach, and that the *Tier 2* approach is expected to be more widely used in the medium term (GOFC-GOLD, 2009). As figure 4.e suggests, this implies that projects should aim for results that are statistically analysable and significant.

Figure 4.e: Accuracy and precision
(Source: Pearson and Brown 2005 [18])



Therefore, in accordance with IPCC recommendations, biomass, like the other carbon stock parameters, should be monitored through inventories based on systematic sampling in permanent plots. The permanence of plots is an implicit requirement in the methodologies, especially for assessments of carbon absorption by standing trees and regenerating trees in a context of forest degradation (exploitation of natural forests). This is because permanent plots produce vegetation monitoring results that are statistically superior to those from temporary plots, because of the low covariance between observations in permanent plots (Avery and Burkhart, 1983). Furthermore, they allow external bodies to verify and repeat measurements. As their location is fixed and known, they can be processed in specific ways to maximise GHG emission reductions and are sensitive to disturbances such as forest fires or destructive sampling.

18. Pearson T. and Brown S. 2005. *Guide to Carbon Monitoring and Measurement in Forests and Grasslands*. Winrock International, Arlington. 39 p.

Temporary plots are therefore more suited to measurements of annual vegetation (Ravindranath and Ostwald, 2008).

Carbon flows, however, are not statistically estimated. Flows will usually be based on existing emission factors (*Tier 2*), because the measurements are not reproducible except if the project is part of a research project aiming to establish specific emission factors (e.g. emissions from enteric fermentation or paddy fields).

Tumbak village, North Sulawesi. Indonesia © Tibo Albemy

Part 5

Recommendations for the socio-environmental REDD+ component

Evaluation and certification of social and environmental impacts of REDD+ projects

Ibi Bateke Project in DRC © ONFI

In brief…

What is meant by social and environmental impacts of REDD+ projects?

- In the Copenhagen "non paper" which has been drawn up by Parties to the UNFCCC during the AWG-LCA meeting at COP 15, 19 principles and safeguards are mentioned, among which five directly address the question of REDD+ mechanism's social and environmental impacts.
- Implementation should be guided by the principles of "facilitating sustainable development, reducing poverty and addressing climate change in developing countries party to the UNFCCC" (principle f.)* and "sustainable forest management" (principle l.).
- The activities undertaken should also "promote and/or support" (the exact wording has not been decided on in the "non-paper"):
  - Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (safeguard c).
  - Full and effective participation in activities on the part of the relevant stakeholders, including in particular indigenous peoples and local communities (safeguard d).
  - Actions that are consistent with the conservation of natural resources and biological diversity, ensuring that [REDD+ activities] are not used for the conversion of natural forests, but instead as an incentive for the protection and conservation of natural forests and their ecosystem services and to enhance other social and environmental benefits (safeguard e).
- A number of aspects still need to be defined and/or specified. Various representatives of civil society also consider that the safeguards are too weak and deplore the "hair-splitting" over the exact wording, which is far removed from the reality and urgency of the situation. Nevertheless, the text places the question of social and environmental impacts at the heart of the mechanism and insists on its fundamental character.
- At project scale, this question is all the more important as it is directly relevant to the strategy for managing risks of leakage and non-permanence of project activities.

*TFCCC/AWGLCA/2009/L.7/Add.6

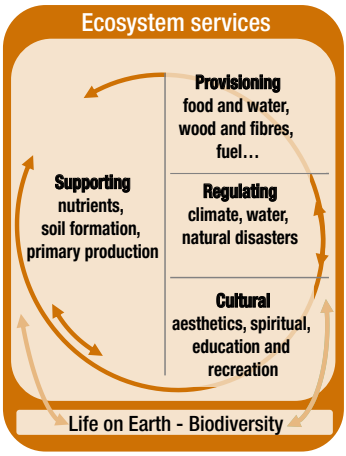
The dedicated technical tool for evaluating social and environmental impacts of REDD+ projects provides for the following:

1. **Understanding the social and environmental issues involved in REDD+ at project scale**
2. **Identifying and verifying the social and environmental impacts of the project**
3. **Certification of these social and environmental impacts**

1 Understanding the social and environmental issues involved in REDD+ at project scale

1.1 - Ecosystem services

Figure 5.a – Ecosystem services
(Source: adapted from MEA, 2005)



Climate regulation is a service that forest ecosystems provide by absorbing and sequestering carbon. Those who benefit from this service are not only the populations who live in or near the ecosystem, but include all of humanity. The immediate aim of REDD+ projects is to maintain the ability of forests to render this carbon sequestration service. This will in turn have an impact on other ecosystem services.

In 2005, the Millennium Ecosystem Assessment (MEA) defined four categories of ecosystem services (provisioning, regulating, cultural and supporting) and underlined the extent to which each of these services depend on maintaining the others.

> The modification of an ecosystem to alter one ecosystem service (to increase food or timber production, for instance) generally results in changes to other ecosystem services as well [19].

The Secretariat of the Convention on Biological Diversity (CBD) describes an ecosystem approach as well as the limits of ecosystem dynamics.

> There are limits to the level of demand that can be placed on an ecosystem while maintaining its integrity and capacity to continue providing the goods and services that provide the basis for human well-being and environmental sustainability [20].

The dynamics of each ecosystem and the interdependence of their ecosystem services means that to maintain carbon sequestration, the other services on which it depends must also be maintained, and also that demand for services that modify the ecosystem (fuelwood, supplies for example) must be reduced. This is a prerequisite to avoid the negative impacts a REDD+ project might have and to ensure that instead it can become a tool for the ecosystem's long-term preservation.

19. Millenium Ecosystem Assessment (2005), CWG / SG7, http://www.greenfacts.org/fr/ecosystemes/millennium-assessment-3/2-ecosystem-services.htm
20. Secretariat of the Convention on Biological Diversity (2004) The Ecosystem Approach, (CBD Guidelines) Montreal: Secretariat of the Convention on Biological Diversity 50 p. http://www.cbd.int/doc/publications/ea-text-en.pdf

1.2 - Climate change and biodiversity: what are the challenges for REDD+?

Climate change and biodiversity conservation are interconnected, because climate change has effects on biodiversity and its geographical distribution (CBD, 2009, AHTEG report n°43), and also because biodiversity conservation has effects on climate change since natural ecosystems usually have greater carbon density (CBD, 2009, AHTEG report n°41). These interconnections are independent of the REDD+, but they raise major challenges for the mechanism.

If it is successful and is able to achieve reductions in deforestation and degradation, the REDD+ mechanism will probably have a positive impact on the conservation of biodiversity-rich tropical forests (Malhi et al. 2008, Brooker et al. 2008). By reducing deforestation and forest degradation, the REDD+ mechanism could help to conserve habitats whose destruction is the main cause of present biodiversity loss (Ravindranath, 2007). Possibilities for generating income for the conservation of forest ecosystems could also have an overall positive impact on biodiversity conservation (Miles and Kapos, 2008). It has further been demonstrated that intact forests are more resilient to climate change, that degradation weakens them (Bush et al. 2008, Malhi *et al.* 2008) and that converting forests worsens the negative impacts on climate change since the greenhouse effect is increased by substitute ecosystems with low evapotranspiration potential and high albedo.

REDD+ has many potential benefits for biodiversity, but could also produce negative impacts. For example, the CBD has concerns over a REDD+ mechanism which is essentially focused on carbon storage with no explicit support for biodiversity and other forest ecosystem services. If this turns out to be the case, there may be a risk of shifting pressure towards forest ecosystems with equally abundant biodiversity but less carbon density, or towards non-forest ecosystems that also have abundant biodiversity (such as bamboo forests). By giving economic value to carbon rich forests, the REDD+ mechanism may also lead to a monopoly of international funding for these ecosystems and ultimately work against the interests of global biodiversity (Berry *et al*. 2008).

One of the most important and potentially most immediate dangers of the REDD+ mechanism arises from the fact that the definition used by the UNFCCC does not distinguish between natural and planted forests and that it gives no clear definition of forest degradation. This means that some forests could be converted on grounds of climate change mitigation (an interpretation that the "REDD+ non-paper" seems to be trying to avoid) with the resulting degradation not accounted for in the reporting on change in forest cover (Putz and Redford, 2009). In a submission to the SBSTA in February 2009, Greenpeace suggested that, rather than calculating changes in carbon stocks to estimate forest degradation, changes in the state of forest cover should be compared to the Intact Forest Landscapes (IFLs) reference, which in fact represents only a small proportion of the forest cover assessed by FAO in its 2005 Forest Resources Assessment (see Figure 5.b).

Figure 5.b - Intact Forest Landscapes – IFLs
(Source: Greenpeace, 2009)

A number of the risks mentioned above are beyond the scope of REDD+ implementation at project scale. However, most of the benefits and risks for biodiversity will be present or must be integrated at the project scale. To strengthen the benefits and avoid the risks, project developers will need to consider them at several different stages, and particularly:

1. When the project perimeter is selected, developers may give priority to ecosystems with high biodiversity value even if their carbon potential is lower. For conservation NGOs, it is important that the REDD+ projects are implemented additionally and not to the detriment of earlier conservation activities in low-carbon ecosystems, or those not eligible for the mechanism.
2. The implemented activities must effectively tackle deforestation and degradation drivers in order to avoid leakage from a general point of view, including shifting pressure toward other ecosystems (e.g. non-forest but high biodiversity areas). Satisfactory alternatives therefore need to be found for deforestation agents at every level (indigenous and local populations, governments or private sector) and measures must be looked into with other competent players to address future drivers and agents (migrant populations or infrastructure development projects).
3. The activities implemented must not have any negative impacts on the environment. Invasive species should be avoided, and if they are used (because they are native, for example), this must only be done with accompanying measures of proven effectiveness.

In general, the impacts of any REDD+ project must be verified in meticulous detail throughout the project's lifetime (see Part 2 of the present chapter).

1.3 - REDD+, indigenous peoples and local communities

As with biodiversity, the question of whether REDD+ will be beneficial or harmful to indigenous peoples and local communities refers to the concept of ecosystem services.

Various human groups depend on forests for their survival and subsistence, but also for the preservation of their culture. Whether they are indigenous to the zone or have lived there for generations, whether they are rural populations or communities whose lives are traditionally linked to the forest, all are considered to be among the most vulnerable groups on the planet, both politically and economically (IUCN, 2010).

These groups are also direct forest users. Their uses may be destructive and they may compete with processes designed to reduce deforestation/degradation. In such cases, indigenous peoples or local communities are considered as agents of deforestation. On the other hand, indigenous peoples and local communities have in-depth knowledge of the zone as well as management systems that can provide valuable input to the sustainable development plans required to set the process in motion. Because indigenous peoples and local communities have both rights and related activities, their presence will have an impact on the REDD+ project. Conversely, implementation of the REDD+ mechanism - which by definition seeks to modify the unbalanced (or unsustainable) dynamics of ecosystems under too much pressure - will have an impact on these peoples and communities.

This issue, which the REDD+ negotiating bodies had initially left undecided, has now become a crucial point in the negotiations. The CoP has recently come to the forefront in the media as a forum where national tensions are expressed and relayed by NGOs, especially in regards the recognition of indigenous peoples by numerous unwilling states. These debates focus in particular on document drafting choices, which have taken on considerable symbolic importance in policy papers concerning the adoption of REDD+. Reactions to the “REDD+ non-paper” drawn up in Copenhagen have, for example, commented on or taken issue with the explicit mention of the UNDRIP, the use of “should” or “shall” in recommendations to the Parties, or whether participation of and compensation for indigenous peoples should be “promoted” or “supported”. There is also a certain amount of diplomatic ambiguity: although the UNDRIP is indeed mentioned in the text, it is not inherently binding in any way and a number of countries have not ratified it (see Box 5.1), and it is only explicitly mentioned as a recommendation.

Despite the inadequacies criticised in certain quarters and the almost complete absence of specific reference criteria, the “REDD+ non-paper” is clearly in favour of sustainable development, poverty reduction and the involvement of indigenous peoples and local communities. This gives an added “development” dimension to REDD+ projects and an incentive to avoid negative social impacts.

Box 5.1 – UNDRIP

The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) was adopted by a General Assembly resolution (61/295) on 13 September 2007, after more than 20 years of negotiations. Although it has no binding force at international level, the UNDRIP sends a strong political signal in favour of indigenous peoples. It acknowledges the basic human rights of indigenous peoples as well as their fundamental freedoms, both individual and collective.

Article 46, amongst other rights over traditional lands, territories and resources, sets out the right of indigenous peoples to govern themselves, their traditional institutions, conflict resolution systems and socio-political organisations. One of the most important rights for REDD+ initiatives is **the right of populations to participate in making decisions that concern them, in accordance with the principle of free, prior and informed consent.**

http://www.un.org/esa/socdev/unpfii/en/drip.html

The main risks inherent in the REDD+ mechanism regarding indigenous or local forest peoples or communities have potential impacts on these populations and on the mechanism's effectiveness. These risks arise from the following factors and could have the following impacts[21]:

1. The REDD+ process could help to clarify land rights but only in the interests of the State or project developers, without taking into account land claims and use conflicts in the area (see Chapter 3). Similarly, the creation of new protected areas carries the risk of excluding populations and community-uses if they are incompatible with the protected area status. If land rights are clarified under REDD+, this will strengthen the enforcement of bans and alter current rules for tolerated access unless remedies are found.
    - In this case, the populations and/or communities who traditionally occupy and use the zone may find that access is now banned or restricted, or will be displaced elsewhere.
    - Land titles may be attributed to them by way of compensation, however the areas may have less environmental and cultural value (zones already degraded or deforested, etc.). Moreover, these rights are often granted only for a fixed duration and do not resolve the issue of sustainable development in the long term.
    - Regarding the mechanism's effectiveness, if populations are displaced without proper compensation, they will inevitably continue their deforestation activities, illegally or outside the protected area. Conflicts over land titles and use could then block the project development process entirely.
2. The creation of new protected areas could prevent peoples from gaining access to, or living in these lands. In this case:
    - Populations would be threatened by the same impacts of displacement to other zones, with similarly inadequate compensation, and
    - The effectiveness of REDD+ implementation could be weakened.

21. List adapted from Lawlor et al. (2009) Sustaining Livelihoods while Reducing Emissions from Deforestation. Options for Policymakers. Nicholas Institute Working Paper 09-02, http://nicholas.duke.edu/institute/ni.wp.09.02.pdf

3. If forest carbon income is not shared with the forest populations (in the form of payments, services, strengthened use rights, etc.):
   - Deforestation drivers will continue to be the most satisfactory activities for populations who will have no reason to discontinue them. Illegal activities will increase and become more difficult to manage.
   - Resentment and opposition from forest people and communities will be exacerbated, as will conflict between groups, government administrations and project developers.
4. Special contracts whereby local populations and forest communities undertake to abandon deforestation activities could be signed without prior informed consent. Local populations may not understand that by doing so they will forfeit their use rights. Such contracts may also have underestimated opportunity costs and thereby provide insufficient guarantees for the communities. Finally, compensation measures, unless they are accompanied by specific supporting measures, could increase the dependence on resources which these populations no longer have any control over.
   - The populations will then become more fragile and vulnerable.
   - In terms of effectiveness, the risks of destructive practices will jeopardise the long-term impact on climate and the permanence of REDD+ initiatives.

At project scale, social issues are similarly dual in nature: respect for populations and the project's contribution to their sustainable socio-economic development on the one hand, and the project's long-term success on the other hand. The principles that must be observed are the same as those set out in the UNDRIP (Box 5.1), especially those on recognition of their traditional lands and their direct involvement in the REDD+ project implementation process, in accordance with the principle of free, prior and informed consent.

All projects will need to address these social impacts in different ways and the implemented activities will vary depending on local peoples' relationships with the land. A social group that has recently settled in the area with an established title to the land cannot be considered in the same manner as reputedly indigenous people who have developed strong cultural bonds with the land they occupy. Some projects may be developed in private lands where the presence of local populations or forest communities is not an issue (such as the Tasmania REDD Forests project, see case study in Annex 4). However, for the ideological and/or strategic reasons indicated earlier, all projects will have to ensure, before the project begins and for its entire duration, that they will have no negative impact on the populations living in or around the project perimeter.

1.4 - What are the financial concerns for a REDD+ project?

The need to verify the impacts of a REDD+ project, whether environmental or social, will have repercussions on its financial feasibility for several reasons:

1. The costs of evaluating and monitoring impacts are by no means negligible; they may turn out to be quite high and may need to be

provided for in the early project stages. This will be the case if there are a large number of people living in the area and if there are no initial data on the zone.
2. The participation of local and indigenous populations to the monitoring activities can help to secure a positive impact on climate, while also bringing new employment prospects for local people and limiting the above-mentioned costs.
3. Whatever the approach used (direct payments, services, reinvestment in projects for the benefit of communities, etc.), some of the benefits must be transferred to the local communities. The redistribution of these benefits must be included in the financial and economic feasibility analyses for the REDD+ project (see Chapter 6).
4. The project's social and environmental benefits can be given prominence to attract investors interested in integrated projects.

On this last point, according to a survey conducted by Ecosecurities in 2009[22]:

- Of 209 companies surveyed, 88% said that social and environmental benefits are one of the main reasons for their interest in carbon forest credits.
- Of 215 companies surveyed, 74% said that benefits for biodiversity were very important or important in choosing forest carbon credits and 69% said that benefits for communities were very important or important.
- Of 215 companies surveyed, 35% said they intended to invest substantially in projects that set a value on biodiversity benefits in biodiversity-based markets.

2 Identifying and verifying the social and environmental impacts of a REDD+ project

All REDD+ projects must ensure and verify throughout the project's duration that the activities put in place have no adverse social and environmental impacts. This is a prerequisite before projects can claim to generate benefits of this type and seek compliance with a dedicated certification standard (see part 3 of present chapter).

Impact assessment and monitoring, both social and environmental, takes place in several stages:

1. An inventory of the initial situation must be drawn up before the project begins.
2. This initial situation must be described and/or quantified.
3. Changes in the situation must be checked for on a regular basis and the new status compared with the initial inventory (quantitatively, if this is the method chosen).
4. Project activities must be readjusted if the previous stages reveal negative effects on the indicators.

22. Ecosecurities *et al*. (2009) *The Forest Carbon Offsetting Survey*
http://www.ecosecurities.com/Registered/ECOForestrySurvey2009.pdf

These different stages should:

- determine whether the project has the desired impact on target groups;
- determine whether the benefits are effectively reaching all target populations, as well as the impact of these benefits of their welfare, survival, geographic representation, etc.
- determine whether these impacts effectively arise from the project itself (and not from external causes, such as the local and national political and/or economic context, climatic factors, etc.).
- explore unforeseen consequences for the beneficiaries, both positive and negative.

2.1 - Social impacts

• Target, control and reference groups

To verify the social impact of a project on a given population, comparisons have to be made between the economic and social situation before the project (t0), during the project (t1) and after the project (t2). Methodologically, the process will only be sufficiently rigorous if it includes estimations of counter-factual effects, in other words, what would have happened or could have happened if the project had never existed. To do this, changes in the economic and social situation of the target group (the people participating in the project) are compared with a control group (people in the project perimeter but not participating in the project), and possibly with a reference group (people who were in a similar situation to the target group before the project but who are outside the project's impact zone). Both of the latter groups must have identical characteristics to the target group in all respects. Comparisons must be made throughout the project's duration (Baker, 2000).

• Scale of observation and sampling

The scale of observation and sampling will depend on the scale of project intervention and the nature of project participants. In many cases, there will need to be several scales of observation. The five principal scales are the individual, households, communities or villages, infrastructures (a school for example) and businesses (a logging company for example) (PREM, 2007). The scale of observation selected will depend mainly on the scale of intervention of the activities to be monitored, the social or organisational structure of the target group, the risks inherent to the context, etc. As far as possible, all project participants should be monitored; however, this is rarely feasible because of the time and costs involved, so a representative sample of the group as a whole is often selected. This sample has to reflect the variety of situations within each given group. Before or during the first assessment, the population should be stratified, even roughly, for example by levels of poverty, land titles and types of professional activity, plus, in the case of an REDD+ project, proximity to the forest, type of forest, etc. (PROFOR, 2007).

The size of the sample will depend, for example, on the number of individuals affected, the level of accuracy required, the budget and time available and therefore on the evaluation process itself.

• Monitoring frequency

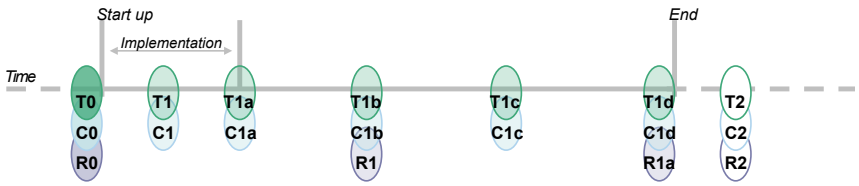
The first stage is to draw up the social and economic profile of the target group before the project (T0). This initial evaluation (or diagnosis) will identify the specific features to be sought in the control and comparison groups. An initial diagnosis should also be provided for these two groups.

Like all forest projects, REDD+ projects are lengthy and benefits are rarely immediate (carbon credits are only generated after several years), but efforts are required from deforestation agents from the start. It is therefore important to make sure that the economic and social situation of project participants does not deteriorate during the time that elapses before the first benefits become tangible (for example before the fruits of a plantation can be harvested). The first assessments should be conducted early enough for any necessary adjustments to be made.

Once the project is up and running, assessments may be made at longer intervals but still on a regular basis and ensuring that monitoring of each group uses the same process as for the target group. To determine the frequency and schedule of assessments during the project, several factors must be considered:

1. the project's duration,
2. the cost and time required for each assessment session,
3. the opportunity of making the assessment,
4. the project schedule, particularly in regards to monitoring.

Figure 5.c – Monitoring frequency (Source: ONFI)



Tn = Monitoring on Target Group
Cn = Monitoring on Control Group
Rn = Monitoring on Reference Group

• Identifying and collecting data

To identify project impacts accurately, the aspects to be monitored must be known beforehand, in other words the questions that the monitoring activities intend to answer. For each of these questions, indicators must be identified beforehand as well as levels of response to each one. Monitoring indicators must take the multi-scale nature of observations into account and, where relevant, cover several scales (individuals, households and communities, for example).

For forest carbon projects, the Social Carbon standard (described in detail below) lists fundamental indicators for six factors (social, human, financial, natural resources, biodiversity and carbon). To assess social impacts, the

social, human and financial factors should be used. At least six levels of response are pre-identified for each of these indicators.

Social Carbon is rather vague on household financial situations. For a REDD+ project that requires a given economic activity to cease or be reduced and which depends on commitment from local populations, it is crucial to assess incomes as precisely as possible. It is also useful to monitor the quantities of forest resources used by project participants and the size of the forested areas they cut.

This initial diagnosis is fundamental because project effectiveness will be assessed against it. For many projects, the data have already been collected and are usable. A prior analysis of existing data is therefore necessary. These are known as secondary data, to distinguish them from those produced specifically for the project, which are called primary data. In virtually all projects, assessments will be partly based on secondary data, even if surveys are conducted, and in many cases, secondary data will be the main or sole source of information (Bamberger, 2006).
The advantage of secondary data is that they can save time and money. When a project has already begun and its benefits are to be evaluated retrospectively, secondary data are often the only way of reconstructing the initial conditions. The main data sources include:

- national censuses, household surveys, specialised demographic surveys, etc.
- data collected by government administrations,
- studies performed by research groups, NGOs, donor institutions, etc.

The main problem with secondary data is that they have been collected for different reasons and their quality cannot be guaranteed by the project. Before using them, it must be ensured that they are not out of date, that they cover the period immediately preceding the project, and that they have been collected for a population similar to the project groups. Finally, it is often necessary to select one indicator per survey.
Whatever the data used, the process implemented to collect them must be documented. Any data for which the collection process is unknown must be handled with caution.

If there are no usable secondary data, priority must be given to the collection of primary data, by conducting specific surveys to answer the questions raised and quantify the situation for each previously identified indicator. Data will usually need to be collected (at least in part) for indicator monitoring during and after the project.
Data can be collected in different ways:

- from a survey conducted specifically for the purpose,
- by capitalising on an ongoing or planned survey (i.e., by adding questions or observations to a survey developed for other purposes),
- through a synchronised survey in which the target population is interviewed, but not the control and comparative groups, who will be monitored through other surveys (national, local, etc.).

There are many techniques for collecting data. The most frequently used are:
- interviews,
- observations,
- questionnaires,
- analyses of written documents,
- targeted discussions,
- case studies.

Each of these techniques has advantages and drawbacks. The choice will not only depend on the method (quantitative or qualitative) and the type of population targeted but also on the logistical demands of the survey.

• Choosing a qualitative or a quantitative approach

Depending on the indicators to be monitored, quantified information will be more or less readily obtainable. It may therefore be preferable to choose a qualitative approach, which will involve describing the situation. Each method has its advantages and drawbacks. Qualitative methods tend to keep closer to the actual situation and avoid gross generalisations, but the main difficulty lies in making a valid comparison between two periods in time.
The scale-based method provided by the Social Carbon standard is able to quantify, albeit approximately, the response to an indicator and therefore allows comparisons of the same response in two different periods. Often, and depending on the indicators, a qualitative approach will have to be combined with a quantitative approach.

• Analysing and comparing data and adjusting activities

All data must be registered and accurately referenced. It is important to systematically document the place and context (such as the season) in which observations or surveys are performed. The main analytical effort will then be the quantification and statistical processing of the information, which has to be done by trained staff under specialist supervision. The data can only be compared if they have been collected by similar procedures avoiding any subjective bias.

As the project proceeds, the context will change and unforeseen factors may emerge or become more important than they were initially. It is essential to provide for a dynamic protocol that will allow the evaluation process to be adjusted to new indicators. New indicators for which there is no reference in the initial evaluation will need specific processing.
In some cases, the assessments may reveal a problem with the project that will also require an adjustment. Any project adjustment will need to be meticulously reported to ensure that its impacts are understood. As soon as any major readjustment is made to the project, it should be worthwhile to increase the frequency of assessments to verify its effects as quickly as possible.

• Existing tools to evaluate and verify social impacts

For a descriptive review of methods and tools available to evaluate the social impacts of forest carbon projects we recommend the *Manual for Social Impact Assessment of Land-based Carbon Projects* (2010) by Michael Richards

(Katoomba Ecosystem Services Incubator, Forest Trends) and Steve Panfil (CCBA), in partnership with the Rainforest Alliance and FFI. The manual is in two separate parts:

- Part 1 : *Core Guidance for Project Proponents*
http://www.forest-trends.org/publication_details.php?publicationID=2436
- Part 2: *Toolbox of Methods and Supportative Materials*
http://www.forest-trends.org/publication_details.php?publicationID=2437

2.2 - Assessing and monitoring environmental impacts

Monitoring the environmental benefits of a project will follow the same procedures as social impact monitoring, in many respects, and the two will often correlate. All the steps described above should be followed and adapted to suit the context.

The data can be collected by adding questions or observations to surveys already under way for other monitoring plans:

- Soil maintenance by forests and reductions in land slips should be analysed by cartographic monitoring.
- Biodiversity monitoring will already be established and should be repeated every five years at least (for the same reasons as for social impact monitoring, i.e. certification by CCBA standards), at the same time as biomass monitoring.
- Specific surveys will be needed (unless already planned for in other studies) to measure changes in the water regime of the catchment basin (quantity and quality).
- For the other ecosystem services, questions should be added to the social impact assessments.

3 Certification of social and environmental impacts

The voluntary markets uses three standards that are more or less dedicated to REDD+ and focus on the social and environmental benefits of projects:

- the ***Climate, Community &Biodiversity Alliance*** standards;
- the ***Social Carbon*** standards;
- the ***Plan Vivo*** standards.

Depending on the project's profile and its commercial strategy plan, projects will prefer one of these standards over the others or may seek certification under two.

3.1 - The CCBA standards

• General description

The *Climate, Community and Biodiversity Standards* (CCBs) are probably among the best-known and most sought-after standards certifying the social and environmental impacts of forest carbon projects.

They were developed by the *Climate, Community and Biodiversity Alliance* (CCBA), a partnership between five international NGOs (CARE, CI, TNC, WCS and the Rainforest Alliance), to encourage the development of forest projects that would simultaneously benefit the climate, local communities and biodiversity. The CCBA receives expert advice from different institutions (CIFOR, CATIE, ICRAF) and financing from various sponsors (Blue Moon Fund, BP, Hyundai, Intel, SC Johnson, SFM and Weyerhaeuser)[23].

In May 2005, the first version of the standards was published after a series of experiments with existing or developing projects in Indonesia, Tanzania, Peru, Equatorial Bolivia, Scotland and Madagascar. The first version was subsequently revised and the second, still in use today, was published in December 2008[24].
Whereas the CCBs had focused until then on initiatives at project scale, new standards now under development, are dedicated to the social and environmental impacts of REDD+ programmes promoted by governments. Comments from the public were invited until 30 November 2009 and the new standard is now being revised. The version submitted for comments, as well as all documents relating to the revising process, can be downloaded from http://www.climate-standards.org/REDD+/.

The CCBs apply to all projects in the AFOLU sector. In July 2010, out of 51 projects registered with the CCBs (under validation or already validated), 16 are REDD+ projects or include at least one REDD+ component among their activities. Of these 16 projects, 6 have been certified, including 4 given the Gold rating and 1 the Silver rating. Altogether, these projects cover over 3 million hectares placed under management and are expected to avoid more than 483 million tonnes of CO_2e emissions (before buffers are subtracted).

The case studies annexed to this guide clearly show the varied profile of projects certified or seeking CCBA certification. They do not all address the same social and environmental issues and there are considerable differences between projects developed on private lands and on community lands (or lands where communities have use or ownership rights).

• The certification process

The CCBs standards do not allow carbon credits to be generated. They award labels to projects that help investors identify forest carbon projects of high social and environmental quality. Furthermore, they certify the project as a whole, not solely the carbon credits, for a period of five years with project lifespan renewal.

23. http://www.climate-standards.org/who/index.html
24. http://www.climate-standards.org/standards/pdf/ccb_standards_second_edition_december_2008.pdf

The validation process takes place as follows:

1. The project developer sends a Project Design Document (PDD) to the external auditor. The PDD must give an exact description of the project and an *ex-ante* estimation of its impact on climate change, local communities and biodiversity, as well as providing for impact monitoring.
2. The external auditor analyses the PDD against the 17 CCBs criteria, and may request additional information from the project developer.
3. The PDD is posted on line for 21 days on the CCBA web site for comments from the public. These comments are then analysed by the auditor and if they are considered relevant, a response will be required from the developer.
4. Once any additional documentation has been supplied, the auditor will visit the project site and complete the project analysis with observations of the project perimeter, interviews with those involved, additional documentation, etc.
5. On completion of the process and once all documents or evidence have been supplied and analysed, the auditor will draw up a validation report specifying the CCBs criteria which have or have not been satisfied.

To be validated, projects must satisfy 14 mandatory criteria (see Table 5.1). Three additional and optional criteria may enable projects satisfying at least one of these to obtain the "Gold" rating. The earlier versions of the standards were already using this system of mandatory and additional criteria and validation levels, but they used 15 mandatory criteria, 8 additional criteria and 3 levels of validation. For example, the Ulu Masen project in Indonesia, the first REDD+ project validated by the CCBs, received the "Silver" rating because it satisfied 5 additional criteria.

The 17 criteria for today's standards are divided into 5 sections: a general section, a section on climate change impacts (carbon benefits proper), a section on impacts for communities, a section on impacts for biodiversity and a section with the three optional criteria.

• Methodology

The CCBA standards are not, strictly speaking, a methodological tool. They do not set out a detailed methodological procedure, instead listing the steps required to ensure a net positive impact on climate (i.e., for REDD+ projects, to ensure that CO_2 emissions are avoided), on biodiversity and on local communities. They usually refer to a series of tools available to make the necessary calculations and/or analyses.

Each of the 17 criteria listed is defined in detail as a list of indicators (additional or exclusive depending on each case). These indicators often refer to existing methodological tools.
To use criterion B1 as an example (the project's net impacts for biodiversity are positive), the first indicator requires amongst others the *use of appropriate methodologies to estimate changes for biodiversity resulting from the project within the project zone and for its entire duration*[25].

25. CCBA (2008) *Project Design Standards* – Second Edition, p.28

This indicator refers to Annex A to the standards, which lists, for each criterion, the tools available to ensure and prove that the criteria are being satisfied. The tools indicated for B1, for example, include the IUCN Red List, CITES, various databases of invasive species, and so on.
Whether for climate, community or biodiversity impacts, the standards obey a three-point logical framework:

- Net benefits must be positive inside the project perimeter.
- They must also be positive when areas beyond the project perimeter are taken into account.
- They must be verified over time, or a monitoring plan must be provided to ensure that they are verified.

The CCBs have a separate section for biodiversity, but they also address other environmental aspects (water regime, catchment basin preservation, etc.) in terms of ecosystem services, and therefore falling under the social impacts section.

Table 5.1 - CCBs validation criteria (CCBA, 2008)

General section		
G1	Overall conditions in the project perimeter	Mandatory
G2	Projections in the baseline scenario	Mandatory
G3	Development and objectives of the project	Mandatory
G4	Management capacity and best practices	Mandatory
G5	Legal status and land titles	Mandatory
Climate section		
CL1	Net positive impacts on climate	Mandatory
CL2	Impact on climate beyond the site (leakage)	Mandatory
CL3	Monitoring of climate impacts	Mandatory
Communities section		
CM1	Net positive impacts for communities	Mandatory
CM2	Impacts for players beyond the project perimeter	Mandatory
CM3	Monitoring of social impacts	Mandatory
Biodiversity section		
B1	Net positive impacts for biodiversity	Mandatory
B2	Impacts for biodiversity beyond the project perimeter	Mandatory
B3	Monitoring of biodiversity impacts	Mandatory
Gold rating section		
GL1	Benefits for adaptation	Optional
GL2	Exceptional benefits for communities	Optional
GL3	Exceptional benefits for biodiversity	Optional

• Conditions of eligibility

The CCBs can be used for all carbon projects in the AFOLU sector (REDD, afforestation, reforestation, forest restoration, agroforestry and sustainable agriculture), with no restrictions as to geographical zone, project size or start date.

In principle and in view of the stated objective of the CCBs standards, priority is given to projects with substantial social and environmental impacts, which will therefore be developed in High Conservation Value Forests. All projects under validation, or already validated, highlight the vulnerability of biodiversity and/or local communities in the project zone as well as the conservation issues addressed by the project.

These standards may be used for projects financed from private or public sources and for projects that are already generating credits under another standard[26].

• When and why use the CCBs?

The CCBA standards can be used for different purposes and at different stages in the project's development.

- They can be used upstream, as a project development tool, not because they provide methodological tools as such (developers are often referred to other tools), but because they enable developers to list the questions and aspects they should focus on when developing projects that seek to produce high social and environmental impacts.
- They can be used during a transitional phase to increase the project's commercial value and attract investment by proving that the project is soundly constructed, that it has the potential to generate compensating assets and that it uses good practice to generate significant social and environmental benefits.
- Finally, they can be used throughout the project's lifetime in combination with another standard (essentially the VCS for REDD+ projects at present), to add value to credits generated under a different mechanism. A project's dual certification can be brought to the forefront when credits are placed on the market and will be reported as such in the credit registry (as VCUs for example).

The right time to submit a REDD+ project to the CCBs standards will depend entirely on the commercial strategy of the developers and their partners. The cost of CCBs certification will be about 40 to 50k€, depending on the project and on the prices quoted by auditing bodies, excluding the costs of developing and drawing up the PDD (WCS 2009). Again, developers are reminded that certification is valid for five years.

The social and environmental issues addressed by projects under validation or already validated vary widely from one project to another. Some explicitly use the CCBs pending the possible validation by the VCS, and because this is one of the only standards that are actually certifying REDD+ projects at present (January 2010). For developers, the CCBs are particularly useful as a way of

26. CCBA (2008) *Project Design Standards* – Second Edition, p.8

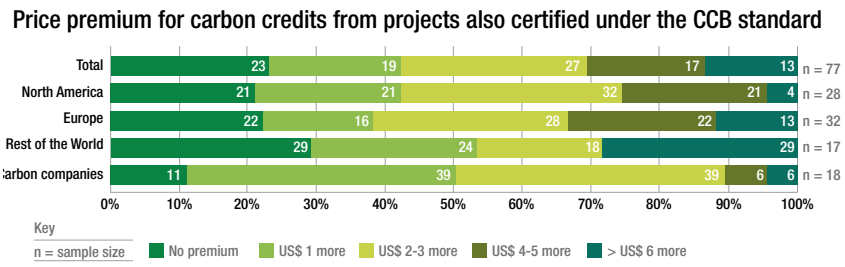
attracting investors (who may also be financing the CCBA, like Hyundai) and obtaining advance funding for their project.

A survey by *Ecosecurities* in 2009 shows that:

- 27% of the 216 companies interviewed said it was highly desirable for the credits they purchased to have dual CCBA certification (i.e., certified by the CCBA, but also by another standard such as the VCS). Nineteen percent said this was desirable. By comparison, only 8% of companies said that CCBA certification was highly desirable and 22% that it was desirable.
- Of 77 companies interviewed across the world, 23% were not prepared to pay more for credits with dual CCBA certification, 19% were prepared to pay 1€ more, 27% were prepared to pay 2 to 3 € more per credit, 17% were prepared to pay 4 to 5 € more and 13% were prepared to pay a premium of 6 € or more (Figure 5.d).

It should be noted that in this survey, only the CCBA standards (which partnered the survey) were explicitly mentioned as a certification standard for social and environmental benefits. Neither Social Carbon nor Plan Vivo were included among the possible responses.

Figure 5.d - Price premium for carbon credits from projects also certified under the CCBA (Ecosecurities, 2009)



3.2 - The Social Carbon standard

• General introduction

Like the CCBA, the Social Carbon standard does not issue carbon credits. It is an additional standard that helps to guarantee that carbon credits have been generated by projects that contribute significantly to sustainable development. Social CarbonTM is a trademark registered at national level (in Brazil) as well as internationally, which can be applied to credits generated by projects certified under the Social Carbon standard.

The Social Carbon concept was first outlined as early as 1998 by the Brazilian NGO Instituto Ecológica, during the implementation of a carbon sequestration project on Bananal island in Brazil. The methodology was developed from the project in 2000, to identify indicators for assessing the social and environmental situation of the project zone, while also encouraging knowledge building by strengthening social relationships and creating sustainable livelihoods compatible with the environment and agreed to by local communities. Since 2000, the Social Carbon approach has improved thanks to assessments of its use in a series of environmental projects.

The first version of the Social Carbon Standard was issued in May 2008. After feedback, the second version was published in June 2008. In May 2009, requirements for the verification of emission reductions were removed and Social Carbon became an additional standard focusing solely on the co-benefits of carbon compensation projects. In August 2009, after a few amendments to the form, the 4th version was issued for public comment.

As well as the different versions of the standard, several other documents were published for downloading on the Internet:

- In 2003, the Social Carbon[27] Book was published, describing the Social Carbon concept related to forest carbon projects, as well as the associated benefits for communities, and methodology. http://www.socialcarbon.org/Guidelines/Files/Social_Carbon_book_en.pdf
- In 2003, Social Carbon published a list of specific indicators for projects http://www.socialcarbon.org/Guidelines/Files/IndicadoresCSFlorestalv01_CM_06-11-08_english.pdf
- In 2009, a guide was published for developers seeking dual certification for their projects under the VCS and Social Carbon standards. http://www.carbonpositive.net/fetchfile.aspx?fileID=168

In 2008, a registry of credits labelled by Social Carbon was established. This registry now includes certified projects that have generated credits and are active, or are in the process of registration[28]. All projects focus on energy (substitution, production from renewables, etc.) and are located in Brazil.

27. Instituto Ecoógica (2003) *Social Carbon, Adding Value to Sustainable Development*. Editora Peirópolis, São Paulo, Brazil.
28. http://www.socialcarbon.org/TZ1/

Apart from those listed in the registry, we have identified four forest projects that use or promote the Social Carbon methodology (see Box 5.2). There are certainly others that are not necessarily seeking Social Carbon certification but that are applying the methodology.

Few forest projects are certified by Social Carbon; this is especially true for REDD+ projects. This pattern can be accounted for by the fact that it is an additional standard that will only certify projects already certified by a standard under which credits can be generated (such as the VCS). To date, there are no REDD+ projects certified by a standard other than the CCBs, which are considered by Social Carbon as an additional standard.

Box 5.2 - List of forest projects using the Social Carbon methodology
(Various sources)

Project name	Country	Type
Reforestation with native commercial species on degraded lands for timber and carbon	Peru	AR
Sao Francisco Forest Project (former Genesis Forest Project)	Brazil	AR and REDD
The International Small Group and Tree Planting Program (TIST)	India	AR
Reforestation of degraded grasslands in Uchindle & Mapanda	Tanzania	AR

• The Social Carbon Standard

Although the Social Carbon methodology is available on the Internet, developers who wish to certify a project and use the associated trademark must do so through an accredited organisation. This may be done either under contract with one of these organisations[29], or by obtaining accreditation themselves (see Box 5.3).

To be certified under the Social Carbon standard, a carbon compensation project must satisfy 5 criteria:

1. **It must be eligible for another standard:** as an additional standard, Social Carbon has not established eligibility criteria for project type, size, crediting period, baseline scenarios and monitoring methodologies. Projects have to demonstrate that they satisfy the eligibility criteria for another standard that certifies emission reductions (such as the VCS) and that the PDD has been validated and subsequently verified by an independent body[30].

29. The list of accredited organisations is available from: http://www.socialcarbon.org/Partners/Organizations/
30. In January 2010, the list of accepted standards was not yet available on the site, cf. http://www.socialcarbon.org/Guidelines/

2. **It must apply the Social Carbon methodology**
   a. The methodology must be used by an accredited organisation.
   b. Indicators must be established and used so as to provide a detailed picture of the main benefits and impacts of the project in regards to the six resources listed in the methodology.
   c. New or revised indicators must be submitted beforehand to the Social Carbon team for validation.
   d. The data used to quantify the indicators must have been collected through interviews, questionnaires or meetings with project stakeholders.
   e. All this information must be compiled in a Social Carbon Report (SCR), for which the model is available on the Social Carbon web site.
3. **Monitoring:**
   a. The project must be verified periodically and each monitoring session must be reported.
   b. Annual monitoring is recommended but the intervals may be lengthened to coincide with the emission reductions verification sessions.
   c. The first Social Carbon Report is known as the Point Zero report. Ideally, it should be produced before the project is implemented and will serve as a reference against which subsequent reports will be compared.
4. **Continuous improvement of project performance:**
   a. Each monitoring session must demonstrate that the project developer is making efforts to improve on the results of the previous session, and that at least some of these efforts are actually under way.
   b. No project will be validated if it shows a drop in performance for any of the resources in two consecutive sessions.
   c. The continuous improvement criterion is applied only after labelled credits are first marketed (and not at the time of the initial diagnosis).
5. **Validation of Social Carbon Reports by a certification body:**
   a. Validation is based on the Social Carbon Report, which must satisfy the standard's criteria.
   b. It includes a site visit to collect information and evidence.
   c. At the end of the validation process, the certification body must produce a validation or verification report.
   d. The report may be validated together with the PDD, if both documents are available at the same time and if the certification body has the required technical expertise.

Box 5.3 - How to become an organisation accredited by Social Carbon?

To be accredited, developers have to obtain a certificate of accreditation which will enable them to develop new indicators for their own or other projects. The certificate of accreditation is obtained by:

1. Submitting a signed application for accreditation to Instituto Ecológica;
2. Demonstrating capacity by applying the Social Carbon methodology in a pilot project supervised by Instituto Ecológica.

Source: http://www.socialcarbon.org/Guidelines/Files/New/SOCIALCARBON_STANDARD.pdf, p.13

• The Social Carbon methodology

The aim of the Social Carbon methodology is to ensure a transparent measure of the social benefits of the project. The methodology comprises:

- **8 general guidelines** on how to undertake the initiative with local players:
    1. The perceptions of local players must be central to the initiative;
    2. It must highlight the potential contributions of the local population;
    3. It must be participatory, holistic, dynamic and flexible;
    4. It must address both local and global aspects;
    5. It must foster analyses of local ecosystems and their biodiversity potential;
    6. It must encourage problem-solving and aim for sustainability;
    7. It must tend towards social inclusiveness and acknowledge gender issues and every form of social difference;
    8. It must take existing power structures and the political context into account.
- A conceptual framework based on the *Sustainable Livelihood Approach* that addresses **6 basic resources**:
    1. Social resources (professional networks, social relationships, trust, affiliations, associations etc.)
    2. Human resources (skills, knowledge, workforce and the population's state of health, etc.)
    3. Financial resources (initial capital, liquidity, credits/debts, disposable economic assets, etc.)
    4. Natural resources (soil, water, air, ecosystem services, etc.)
    5. Biodiversity resources (number and integrity of species, uses, threats, endemic character, etc.)
    6. Carbon resources (type of carbon project, methodology used, carbon performance, etc.)
- **Indicators** developed for each of these resources are established to give a detailed account of the benefits and impacts of a carbon project. To ensure a project's response to an indicator can be quantified, they are applied to several scenarios ranging from the worst case to the best case scenario (see example in Table 5.2).
- **A hexagonal diagram** of the results showing degrees of access to each of the six resources (Figure 5.e). The centre of the hexagon represents zero access to resources, while the outer boundaries represent maximum access to each.
- Data gathering using **participatory methods** (interviews, questionnaires and meetings).

• Monitoring a project's social performance

One of the main advantages of the Social Carbon methodology is that it can be used to monitor the social performance of a project over time.

In each monitoring session, the project developer collects the information required to identify, for each indicator, the scenario that comes closest to the actual situation. This will produce a quantified result that can be compared from one year to the next. In Figure 5.e, the coloured lines represent the results of 5 project monitoring sessions after the initial diagnosis (Point Zero).

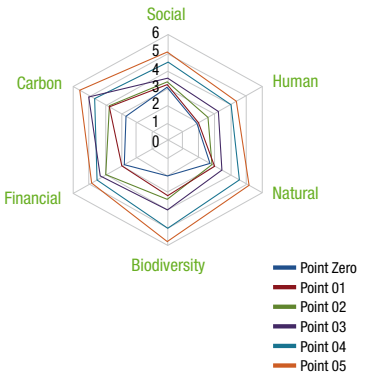
• When and why should the Social Carbon standard be used?

The Social Carbon standard can be used in two ways:

- For methodological reference to explain how to monitor a project's social performance. In this case, care must be taken to choose indicators suited to the project and to collect the necessary data.
- The project can be submitted for approval by the standard, in which case the project must use an accredited organisation or obtain accreditation itself.

In either case, developers must bear in mind that Social Carbon does not supply any methodological tools to quantify emission reductions. They will therefore need to use another standard or methodological tool. Social Carbon encourages combined use of the VCS and Social Carbon standards, and specifies that the CCBs and Social Carbon are not redundant. Dual certification by CCBs and Social Carbon may be considered (as in the Genesis Forest Project, see case study in Annex 4).

Figure 5.e -
Performance Index for a project over time



In order to identify the project's impacts accurately, an initial diagnosis (Point Zero) should be made before project implementation. However, the social Carbon standard can be used at any point in the project, on the understanding that the initial diagnosis will be made at the time of drawing up the baseline scenario.

Table 5.2 - Example of a gradient for the"Financial resources – rural markets" indicator (Source: SCM, 2003)

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
If agricultural production, no trade.	Very low agricultural production and virtually no trade. Produce consumed by producers themselves.	Low agricultural yields and marketing of some produce.	Production and marketing of agricultural produce.	Production and marketing of agricultural produce with guaranteed food security.	Marketing of agricultural produce as a reliable and regular source of income.

Box 5.4 – Lack of clarity in Social Carbon terminology

The name Social Carbon is used in many different ways. For example, the most recent version of the standard mentions SOCIALCARBON®, SOCIALCARBON Indicators, SOCIALCARBON Methodology (SCM), SOCIALCARBON Registry, SOCIALCARBON Standard, SOCIALCARBON Indicators, SOCIALCARBON Concept, SOCIALCARBON diagnosis, reports, team etc. Despite the glossary, it is sometimes difficult to avoid confusion and to understand exactly what or who is being referred to.

In attempting to clarify the terminology, we believe it is important to note that:

- The Standard is a set of 5 criteria, one of which is the use of the Social Carbon methodology.
- The methodology is a process that project developers are free to use at will. It essentially involves identifying indicators, regular project diagnoses against these indicators and using a hexagonal diagram to illustrate project status.
- The methodology is freely available and all project developers can use it. However, to certify the credits and use the Social Carbon Trademark, the methodology must have been used by an accredited organisation and validated by a certification body.
- An organisation is accredited by the Social Carbon team (Instituto Ecológica) in accordance with a specific procedure. A certification body is an independent entity (such as a DOE), which is qualified to certify projects (e.g., in January 2010, BUREAU VERITAS CERTIFICATION and TÜV-Nor - http://www.socialcarbon.org/Partners/Entities/). The Social Carbon Reports are produced by an accredited organisation and validated by the certification body.
- The site at www.socialcarbon.org is the site for the Standard, which provides documents explaining the methodology. The www.socialcarbon.com site, however, is the site for the Social Carbon Company, which is a consultancy set up by Instituto Ecológica (which founded the methodology) in partnership with CantorCO_2e. The Social Carbon Company (SCC) it is an organisation with accreditation to use the Social Carbon methodology.
- The Social Carbon team is composed of members of the Instituto Ecológica NGO. It is responsible for the registry, for developing procedures and methodological tools and for delivering certificates of accreditation to other organisations.
- The SOCIALCARBON® trademark is the label given to credits, registered by Instituto Ecológica, which now owns it.

Box 5.5 - Dual VCS and Social Carbon certification on the carbon markets

In a dedicated guide, Social Carbon points out that the two standards are complementary. On the carbon market, the sale price of VCUs is 50% higher on average when they are certified by Social Carbon (these are credits generated by energy projects). Thanks to its reputation as a flexible and dynamic standard (with indicators adapted to each project), VCUs certified by Social Carbon has gained substantial market share, from 1% of credits traded in 2008 on the international market to 26% in 2009

Source: http://www.carbonpositive.net/fetchfile.aspx?fileID=168

It is essential to incorporate the Social Carbon approach in the project validation schedule:

- It will be less costly to undertake the validation process for the initial Social Carbon Report (and for subsequent periodical reports) at the same time as PDD validation.
- The data to be collected for the initial diagnosis may be used to complete the information in the PDD.
- According to Instituto Ecológica, which developed the *Genesis Forest Project* in Brazil (see case study) and founded the Social Carbon methodology, it is important not to begin data collection too early so as not to arouse expectations among local communities that might take a long time to materialise.

3.3 - Plan Vivo

• General introduction

Unlike the Social Carbon and CCBs standards, Plan Vivo is not additional but a standard in itself, which allows projects of very specific types to generate VERs known as Plan Vivo certificates. One certificate is delivered for each tonne of CO_2 sequestered or avoided thanks to projects on community land use. Besides its numerous eligibility criteria, the specific feature of the Plan Vivo standard is that it addresses carbon sequestration and storage activities in terms of payments for environmental services (PES) and ensures that the payments are made directly to producers making appropriate changes in their practices. Plan Vivo projects aim to change the dynamics of land use in the zone and in the long term, and to encourage producers to shift to sustainable and more rewarding practices. In this context, avoided deforestation is rarely considered as an activity in itself; rather, it is usually incorporated into management plans for a zone where, depending on the initial state of the land, several productive activities can be introduced at once (afforestation, reforestation, agroforestry or sylvo-pastoral systems, etc.). The Plan Vivo system is based on management plans which local producers undertake to apply in return for contracts signed with the project coordinator for the sale of the certificates generated (Box 5.6).

Box 5.6 - What is a Plan Vivo?

As well as the name of a set of standards, a system and a foundation, a Plan Vivo is also a “living plan”, meaning a management plan developed by a producer to manage his or her lands over the long term. A Plan Vivo includes carbon sequestration or emission reductions as economic activities financed by the sale of Plan Vivo certificates.

Source: Plan Vivo Standards, 2008.

Besides the standard, the Plan Vivo system comprises a registry, an administrative process (for registry management in particular), technical tools and guides. It was designed and developed in 1994 under a research project financed by the UK's DFID in the Chiapas in Mexico: the *Scolel Te* reforestation project.
In 2002, one of the project leaders (the Edinburgh Centre for Carbon Management – ECCM) transformed Plan Vivo into an independent association called BioClimate Research and Development (BR&D), which was dissolved in 2008 and whose activities were transferred to the Plan Vivo Foundation, which is now wholly responsible for managing the Plan Vivo system.
Several versions of the Plan Vivo standards were published in 2008. The most recent (October) can be downloaded from http://www.planvivo.org/documents/standards.pdf. In 2009, partially free access to the registry became available through the *Market Environmental Registry* site (http://www.tz1registry.com/).

At the end of January 2010, 4 projects had been validated (Box 5.7) and 3 were in the process of validation[31]. Three certified projects are now running activities to avoid deforestation or conserve forests.

Box 5.7- List of Plan Vivo projects (Source: www.planvivo.org)

Project name	Country	Activities
• Trees for Global Benefits	Uganda	Afforestation/reforestation, agroforestry
• Sofala Community Carbon	Mozambique	Agroforestry, avoided deforestation, conservation
• Scolel Te	Mexico	Afforestation/reforestation, agroforestry, conservation, restoration
• Nyika and Mkuwazi Forest Conservation	Malawi	Avoided deforestation, conservation

Several technical documents are available on the Plan Vivo web site. These are the *Technical Specifications*, which are methodologies developed by a project to calculate the carbon credits its activities can generate, manage and monitor activities, analyse and reduce risks of non-additionality, leakage and non permanence and assess a project's socio-economic and environmental impacts. The following documents are relevant to projects for avoiding deforestation and conserving forests:

- *Forest management and conservation (tropical lowland humid forest)* drawn up by AMBIO for the Scolel Te project in Mexico and approved by Plan Vivo in 2007.
http://planvivo.org.34spreview.com/wp-content/uploads/forest_management1.pdf
- *Avoiding Unplanned Mosaic Deforestation and Degradation in Malawi* drawn up by the Malawi Environmental Endowment Trust and submitted to Plan Vivo in 2009.
http://planvivo.org.34spreview.com/wp-content/uploads/TS-MAL-AUMDD-V1.0.pdf
- *Conservation of Miombo Woodland in Mozambique* drawn up by Envirotrade for the Sofala project and submitted to Plan Vivo in 2009.
http://planvivo.org.34spreview.com/wp-content/uploads/MOZavoided-deforestation-technical-specification.pdf

31. http://www.planvivo.org/?page_id=87

• Eligibility conditions

To be eligible for the Plan Vivo standards, a project has to satisfy a number of initial criteria concerning its activities, participants, project coordination, land types and the project start date. (Table 5.3)

Table 5.3 - Eligibility criteria for the Plan Vivo standard
(Source: Plan Vivo, 2008)

Criteria	Eligibility
Activities	• Agroforestry and afforestation (small-scale logging, plantations for fruit or fuelwood, etc.). • Restoration and reforestation of degraded or damaged ecosystems. • Conservation and avoided deforestation in endangered forests or woodlands where the threat is real, credible and proven. • All activities must use only non-invasive native or naturalised species and promote restoration or protection of native ecosystems.
Participants	• Project participants must be smallholders who depend on and use forests in a developing country. • They should belong to an organisation or have formed organisations or groups such as cooperatives, associations, etc. • They are not structurally and permanently dependent on salaried work and are in a position to exploit their lands alone or with their families.
Coordinator	• The project is managed by a coordinator who recruits producers (participants), coordinates training, supervises technical aspects, conducts activity monitoring, coordinates carbon sales and reports annually on project activities to the Plan Vivo Foundation • The coordinator is an NGO which is familiar with local groups and, ideally, has already worked with the producers. • Eligible organisations are local, national or international environmental NGOs, independent funds or specially created not-for-profit companies (NFPCs).
Eligible lands	• Lands to which the producers have a title or long-term use rights. • Absence of conflict over land titles or use rights that could jeopardise the project's implementation and long-term viability. • Eligible lands are lands owned by smallholders or rented croplands, community-owned lands and lands in which communities have recognised use rights.
Retroactive effects	• A project certified after activities have been implemented will not be able to claim carbon benefits retroactively.

• Project development and the certification process

A Plan Vivo project generates certificates after each verification session. The project must have been validated and registered beforehand. There are 4 phases in the certification process. Table 5.4

Table 5.4 - The certification process for a Plan Vivo project
(Source: Plan Vivo, 2008)

Phases	Stages	Results
1. Conceptualisation	• Development of a PIN • Evaluation and registration of the PIN	The PIN is registered and posted to the Plan Vivo web site
2. Development	• Development of technical specifications and the PDD by the coordinator and project partners • Approval of the technical specifications and the PDD by the Plan Vivo Foundation's panel of technical experts	The PDD and technical specifications are given approval
3. Registration	• Validation of the project after a visit to the site by Plan Vivo or an expert appointed by Plan Vivo • Registration of the Plan Vivo project, review of the PDD, the technical specifications and the validation report	Validation report and registration as a project able to market carbon credits (on-line)
4. Active phase	• Annual reporting after *in situ* assessments and monitoring • Certificates issued • Verification by an independent party selected by the coordinator and approved by the Foundation	Certificates confirming to buyers that the ecosystem system service is effectively rendered

To be certified, the project has to satisfy the Plan Vivo criteria, which cover 4 main areas:

- Effectiveness and transparency of project governance (technical, social and administrative)
- Carbon benefits
- Benefits for ecosystems
- Livelihood benefits

Several criteria and corresponding validation or verification indicators apply to each of these areas.

• When and why should Plan Vivo be used?

The Plan Vivo standard was designed for land use projects managed by and for local communities. It is therefore essentially relevant for projects intending to introduce a mechanism for Payment for Environmental Services among forest communities. It is a demanding standard that should be considered before

activities are implemented, to ensure the project satisfies all Plan Vivo criteria and because carbon benefits cannot be claimed retroactively.

Another specific feature is that instead of proposing or imposing a carbon methodology, the Plan Vivo standard requires each project to develop its own methodology. This means that the standard is very flexible and that methodologies can be adapted to each project. However, this approach usually increases the workload as well as demanding more expertise and funds to develop the project.

The standard is very demanding on economic and social aspects, thereby guaranteeing the reliability of community-centred projects. Although it demands projects focusing on economic development among local producers, the question of co-benefits is not described in detail.

Finally, the standard still has a limited audience and is not readily accepted on the carbon markets (Lopes, 2009). In its 2009 survey, *Ecosecurities* mentions that Plan Vivo is the preferred standard for the smallest number of companies interviewed (11%) and that this is essentially accounted for by a lack of understanding of the standard, as 62% of the companies said they were not familiar with Plan Vivo. *Ecosecurities* also indicates that Plan Vivo, because its projects are implemented over small areas, would interest people looking to buy small amounts of credits, but would be unlikely to interest companies seeking to offset their carbon emissions on a large scale.

3.4 - Other standards

• Environmental and social impacts in the other carbon standards

Besides the CCBA, Social Carbon and Plan Vivo, very few of the other standards that accept REDD+ projects take social and environmental impacts into consideration:

- The **Voluntary Carbon Standard** (VCS) is a carbon accounting standard that takes practically no account of co-benefits. It should be noted, however, that an AFOLU project will only generate VCUs if the project activities have no adverse impact on the environment and on the local socio-economic situation. The VCS demands mitigation measures to counter any significant negative impact.
- The **American Carbon Registry** accepts REDD+ projects in America and in countries not included in Annex 1 to the Kyoto Protocol. The ACR requires assessments of the social and environmental impacts of projects and mitigation of any possible negative impacts. The ACR will accept as proof, but not demand, certification to FSC standards and/or compliance with the CCBs. The project developer must be able to describe the social and environmental situation without the project. The registry refers developers to the tools listed by the CCBs to identify, assess and report on social and environmental impacts. http://www.americancarbonregistry.org/carbon-accounting/ACR%20Forest%20Carbon%20Project%20Standard%20v1%20March%202009%20FINAL.pdf

- Developers should note that, unlike version 2.1 now in use, the revised version (version 3) of the **California Climate Action Registry** (CCAR) Forest Protocol mentions avoided forest conversion and is open to projects throughout the USA and in Canada, Mexico and Brazil[32]. Neither of the two versions mentions the social and environmental impacts of projects. http://www.climateregistry.org/resources/docs/protocols/project/forest/forest-revisions/draft-forest-project-protocol-december-2008.pdf

Box 5.8 - Social and environmental impacts in CDM forest projects

The PDD for afforestation/reforestation projects must:

- Describe the initial environmental situation and social context in the project zone and the surrounding region;
- Detail the environmental impacts of project activities within and beyond the project perimeter and provide supporting documentation;
- Demonstrate if no negative impacts are considered significant, then the PDD must provide proof that an impact assessment has been performed and is confirmed.

Source: Dickson *et al.* 2009

32. Version 3 of the Protocol is described as under review. It is dated December 2008 and at the time of our most recent visit to the site (January 2010), no information was given on the validation schedule for this protocol. http://www.climateregistry.org/tools/protocols/industry-specific-protocols/forests.html

CGOS reforestation project in Madagascar © ONFI

Part 6

Recommendations for the financial REDD+ component:

Financial and economic assessments of REDD+ projects

Peugeot Carbon Sink Project in Brazil © Antônio Carvalho de Freitas, ONFI

In brief…

What is meant by financial and economic assessments?

- A project's implementation is conditional upon financial analysis which is a standard methodology used to *ex-ante* determine the project's viability and profitability. Financial analysis is targeting a specific agent (or a group of agents) taken individually. It needs to be both exhaustive and objective and should produce an irrefutable estimation of its added value.
- The financial analysis takes place in three stages that must be rigorously followed and incorporated into a synthesis framework. To avoid any biased conclusions, each component must be considered essential to the assessment's credibility.
    - The development of the project's business model enables the introduction of basic factors, such as expenses and revenues and how they are spread over time. This is a fundamental step, in particular because any over or under-estimation that may appear when incorrect assumptions are made on project costs and income, will damage the project's credibility as well as its implementation.
    - An analysis of financial indicators will be used to make a preliminary assessment of a project's financial feasibility. This analysis is based on the profitability criteria and indicators used for financial analyses in general (Net Present Value, Internal Rate of Return, Equivalent Annual Value).
    - A sensitivity analysis should then be made if the above indicators suggest that the project is financially viable. The objective is to identify, among the assumptions made for the financial analysis, those factors with a significant impact on the project's financial results. These factors should eventually be improved or secured.
- In virtually all REDD+ projects, added value is not limited to the generated carbon flows, it also includes other more or less quantifiable benefits, some of which may attract specific investments. If these benefits are quantifiable, they must be included in the financial analysis. If not, they must be included in the economic analysis.
- The economic efficiency analysis also examines profitability. But in this case, the emphasis is on all benefits for society as a whole, and not only on financial flows from the investment point of view. The economic analysis will use the results of the financial analysis as a starting point and will therefore come in a second time.

The technical tool for financial assessments of REDD+ projects is used for:

1. **Defining a model for the project**
2. **Assessing its financial feasibility and analysing its economic efficiency**
3. **Financing the project**

1 Defining a model for the project

1.1 - Identifying and analyzing REDD+ project income

• Estimating project income

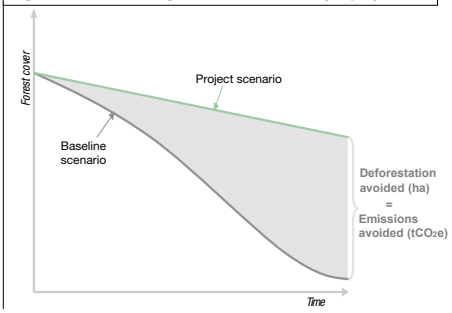
REDD+ projects generate benefits of two types:

- those involving real flows, defined here as **income**,
- those that do not generate real flows, defined here as **co-benefits.**

The financial analysis should only include income. Co-benefits will be included at the later stage *via* the economic analysis of the project.

REDD+ projects are directly aimed at obtaining tradable carbon units, which will therefore be the main income generated by these projects. Making an *ex-ante* estimation of emissions avoided by a REDD+ project effectively means comparing a scenario for deforestation and associated CO_2 emissions without the project (the baseline scenario), with a scenario for deforestation and associated CO_2 emissions with the project (the project scenario). The difference between the two scenarios will be the deforestation and emissions avoided due to the project (see Figure 6.a)[33], which are usually expressed in tonnes of CO_2 equivalent (tCO_2e).

Figure 6.a - Estimating emissions avoided by a project



The *ex-ante* estimation of avoided emissions is fundamental as it will determine the project's viability. A project whose carbon benefits are under-estimated has fewer chances of attracting investment because of its apparently lower yields. However, overestimating the carbon benefits will attract financing for projects that are not viable in terms of their climate impacts, as well as their financial returns.

To ensure that the *ex-ante* estimation of emissions avoided thanks to the REDD+ project is reliable, it is important to determine the baseline scenario emissions as accurately as possible (see Chapter 4) as well as the project scenario emissions (see Chapters 2 and 4).

• Analysing flows over time

Avoided tCO_2e tonnages are converted into tradable credits after verification. Time is a factor here and is addressed on three levels in the analysis:

1. **The project's duration**, which must be long enough for the activities to take effect and produce the expected benefits. This will determine the beginning and end of income generation.

33. For more details on baseline and project scenarios, see REDD+ methodologies and Chapters 2 and 4 of this guide.

2. **The frequency and quantity with which the avoidance of emissions actually occurs** over time (see figure 6.1), and
3. **The way flows are spread over time**.

The way flows are spread over time will depend on when the project intends to market the credits, a decision that must be made by the promoters and which will have an impact on the value of the credits to be sold. The credits will be validated after they have been verified and after submission and validation of the verification report. Verification is necessary to generate credits and is therefore the decisive factor in the way flows are spread over time. The frequency of verification will depend on the selected standard (Box 6.1).

Box 6.1 - Verification frequency under Plan Vivo, CCBs and VCS standards

• In order to minimise risks of non-permanence, the Plan Vivo standard requires annual monitoring of GHG emissions avoided by the project. Monitoring results must be reported and will determine whether Plan Vivo certificates are awarded or not.

• The CCBA standards do not allow projects to generate tradable units, but will certify projects for 5 years. Initial validation is based on a PDD which must include a monitoring plan, or at least an undertaking to develop a monitoring plan within six months after project validation. Subsequent validation sessions will be based on the data supplied by monitoring results for the project's climate, environmental and social benefits.

• With the VCS, credits issuance depends on verification and validation of the avoided emissions. Project prior validation includes among other things, the monitoring plan validation. Although there is no mandatory regular project verification after the first issuance of VCUs, developers are encouraged to proceed to this verification at five-year intervals. For more details, see Box 6.3 on the VCS non-permanence buffer.

Each developer – within the limits imposed by the standard – is responsible for determining the optimal frequency of verifications for its project. This optimal frequency will depend on the trade-off between liquidity needs, verification costs, the value of the credits and the actuarial value of the net income (see below).

Real carbon income flows should only be incorporated into the financial analysis once they are generated, in other words, after verification of the avoided emissions.

• Reserving a share of the income

Like all forest carbon projects intending to market their credits, REDD+ initiatives carry a certain amount of more or less intrinsic risk of non-permanence of the carbon stocks sequestered in forests.

The emission reductions obtained by a project at point *t* in its implementation may be partly or entirely cancelled out at a later stage by natural incidents (forest fires, pests or diseases, climate events) or socio-political factors (instability, major political changes) over which the project developer has no control. The

carbon credits generated by the project at point t will then no longer be valid. This is called the *non-permanence risk*.
The non-permanence risk was addressed for CDM afforestation/reforestation projects *via* a system of temporary credits that have to be replaced every five years (tCERs) or at the end of the project (lCERs).
On the voluntary market, some standards among which the Voluntary Carbon Standard (VCS) offer a buffer system to handle the non-permanence risk[34]. Known as the **non-permanence buffer**, the system involves setting aside part of generated VCUs and depositing them in a reserve managed through a dedicated registry, which is effectively a collective security deposit. All VCS-certified forestry projects across the globe deposit a certain quantity of credits calculated in accordance with the specific risks that arise in each project. The reserved credits are meticulously recorded in a dedicated registry and are not available for sale. For the sake of clarity, these credits are referred to in the VCS context as *buffer credits* as opposed to generated VCUs.

Box 6.2 - Examples of non permanence buffer in the case studies

Oddar Meanchey, Cambodia	20%
Kasigau, Kenya	No buffer
Juma, Brazil	10%
Sofala, Mozambique	25%

Buffer credits are setting aside in the non-permanence buffer at each verification session, in accordance with a risk analysis also performed for each session. In their financial analysis, developers should therefore plan to reserve a proportion of the credits generated, which will not be available for sale.
To help determine the quantity of credits that should be reserved, the VCS standard offers a risk analysis tool[35] for REDD+ projects, with 3 pre-defined levels of risk:

- **Low** –> **10%** of credits reserved
- **Medium** –> **10 - 30%** of credits reserved
- **High** –> **20 - 40%** of credits reserved

The buffer system as described by the VCS is valid for VCS-certified REDD+ projects. It is sometimes required by other standards (CCX, ACR, CAR) in the VCS or other adapted formats. In their strategies for managing investment risks, some projects use this method internally, with or without the VCS risk analysis tool to work out the proportion of credits that need to be reserved (for example, the Juma project has deposited 10% of its credits in a dedicated account, see case study in Annex 4).

34. http://www.v-c-s.org/docs/Tool%20for%20AFOLU%20Non-Permanence%20Risk%20Analysis%20and%20Buffer%20Determination.pdf
35. *Op.Cit.*

Box 6.3 - The VCS non-permanence buffer

If a project *P* has avoided emissions of 100 tCO_2e in the first five years of implementation, and the risk analysis performed previously has confirmed that a 30% buffer should be applied, then out of 100 tonnes of avoided emissions, 30 will be reserved in the buffer. The other 70 tonnes will be transformed into VCUs and placed on the market. Once the first VCUs have been generated, there will be three possible situations for the project *P*:

Situation 1. A new verification session will begin within the next 5 years and will show that, during this period, there are more emissions in the project scenario than in the baseline scenario (negative impact on climate).

Situation 2. A new verification session will begin within the next 5 years and will show that there are fewer emissions in the project scenario than in the baseline scenario (positive impact on climate) and that the project is effectively reducing the non-permanence risk.

Situation 3. No verification session will be performed in the 5 years following the initial issue of VCUs.

In **situation 1**, no further VCUs will be generated and the buffer registry will cancel a quantity of buffer credits equivalent to the difference between the two scenarios.

If in the 5 years following the initial issue of VCUs, no further verification is performed for project *P* (**situation 3**), the buffer registry will cancel a quantity of buffer credits equivalent to 50% of the buffer deposited in the initial period. If there is still no verification in the next 10 years, the remaining 50% of these buffer credits will also be cancelled. Finally, after 15 years with no further verification, it will be considered that the VCUs already generated are no longer reliable. In this case, the registry will cancel a quantity of credits in the collective buffer equivalent to the quantity of VCUs previously generated (70 VCUs in our example).

Neither situation 1 nor situation 3 have any effect on VCUs already issued, which are therefore considered permanent.

There is nothing to force developers to perform subsequent emission verifications, but they are strongly encouraged to do so. If they do not, they will not generate any new VCUs. In addition, further verification sessions will enable them to retrieve some of the credits reserved in the previous verification sessions.

This occurs on two levels, which illustrate **situation 2**:

- If, during a verification session B, a new risk analysis shows that the project has effectively reduced these risks, the buffer applied will drop to 25% instead of initial 30%, but the developer will be able to apply this adjusted rate retroactively and – in addition to the 75 VCUs thus generated in period B - retrieve some of the credits reserved previously. For project *P*, this will mean 5 reserve credits (*or* (100*30%) – (100*25%)) removed from the buffer and transformed into VCUs.
- In addition to this reassessment, if the developer can show that the credits generated previously have been maintained and that the project is effectively controlling risks (i.e. a new analysis shows that the risks have diminished), 15% of the reserved credits can be retrieved. For project *P* and during verification session B, this will amount to 4.5 buffer credits (*or* 15%*30).
- Another point to remember, is that a developer will be able to reclaim some of the cancelled credits (**situation 3**) if a verification report is submitted before the end of the crediting period.

At the end of the project, generated credits registered by the project that are still in the buffer will be automatically removed from the reserve.

Box 6.4 - Estimating the income generated by a REDD+ project: a simplified theoretical example

In the present REDD+ landscape, financial data for projects are often confidential. We have therefore used a theoretical example with 4 monitoring sessions, conducted every 5 years over 20 years.

The first hypothesis assumes that the risk analysis for those four verification sessions has shown that the risks have effectively been reduced. The buffer rate is therefore adjusted retroactively and 15% of the buffer credits are released. The second hypothesis assumes, indicatively, that the project will be maintaining a buffer throughout the project duration at a fixed maximum rate and that it will not retrieve any buffer credits.

An average price is fixed for the entire project duration at 6.3US$/$tCO_2e$ or 4.1€/tCO_2e.

		Project duration (20 years)		
		+1 year	+2 years	+3 years
	Deforestation avoided annually (ha)	180	177	174
	Gross avoided emissions (tCO_2e/year)*	72,000	70,800	69,600
	Monitoring (sessions)			
Hypothesis 1	Buffer (%)	30%	30%	30%
	N° of buffer credits	21,600	21,240	20,880
	Balance	50,400	49,560	48,720
	Sum total	50,400	99,960	148,680
	N° of VCUs generated			
	Income (€)			
	Cumulative income (€)			
Hypothesis 2	Buffer (%)	30%	30%	30%
	N° of buffer credits	21,600	21,240	20,880
	N° of VCUs generated			
	Income (€)			
	Cumulative income (€)			

* Simplified calculation: emissions arising from project activities and leakage due to activity displacement should also be subtracted to work out the effective avoided emissions.

** For sessions B,C and D, credits are calculated according to the new avoided emissions, with the buffer adjusted over all the previous verification sessions and 15% of all buffer credits released for trading.

Area:	30,000 ha	
Buffer:	30%	
Baseline scenario:	1.1% annual deforestation	
Project scenario:	0.5% annual deforestation in the first 5 years and 0.2% in the next 15 years	
Project duration:	20 years	
Average forest carbon stock :	130 tC/ha	**CO_2 emissions arising from land-use change =** (130 – 20) x 44/12 = 400 tCO_2e/ha
Average carbon stock with alternative uses:	20 tC/ha	

Project duration (20 years)					
+4 years	**+5 years**	**+6 years**	**+7 to +10 years**	**+11 to +15 years**	**+16 to +20 years**
171	169	254	982	1156	1081
68,400	67,600	101,600	392,800	462,400	432,400
	A		B	C	D
30%	30%	25.5%	25.5%	21.68%	18.42%
20,520	20,280	30,480.0	100,164.0	100,248.32	79,648.08
47,880	47,320	71,120	292,636	362,152	352,752
196,560	243,880	315,000	607,636	969,788	1,322,540
	243,880		395,112**	417,873.38**	412,977.72**
	999,908		1,619,959	1,713,280.84	1,693,208.64
	999,908		2,619,867	4,333,148.04	6,026,356.68
30%	30%	30%	30%	30%	30%
20,520	20,280	30,480	117,840	138,720	129,720
	243,880		346,080	323,680	302,680
	999,908		1,418,928	1,327,088	1,240,988
	999,908		2,418,836	3,745,924	4,986,912

Projects adopting the buffer solution to manage non-permanence risks will only obtain real incoming flows after deducting the predefined percentage and in accordance with the intervals defined by the monitoring plan. At this stage, flows are still expressed in numbers of tradable carbon units to which a financial value has yet to be given.

• What will be the value of the generated credits?

The price put on the carbon credits will be decisive for the project's financial viability.

It will depend in principle, and especially, on:

- The nature of the units (VCUs, Plan Vivo certificates, etc.),
- Market price fluctuations for the unit
- Risks associated with the credit issuance.

There are several annual reports available that report on carbon market prices, and on the forestry markets in particular, giving an idea of their wide variability[36]. Although these can be valuable indications for forest projects, there is not yet enough feedback on REDD+ projects to have any real influence on current or future carbon unit prices. Prices are usually fixed over the counter between the buyer and the vendor by various methods (fixed-price, indexed price, a combination of the two or indexed price with a ceiling[37]). Price levels usually depend on project costs, the developer's experience, the project's co-benefits, the label (or labels) awarded and the risks of non-issuance or non-conformance of the benefits.

On this last point, risks are estimated as proportional to the project's state of advancement. The more advanced the project is, the lower the risk of non-issuance is (Chenost *et al*., 2010). Credits sold after validation will have more value than credits sold against advance payment, in which case the buyer cannot be certain that the credit will meet the standard of quality announced (co-benefits) or even that the credits will actually be issued. Nevertheless, and even though investors are reluctant to opt for this solution, pre-sales can help to cover the costs of implementation and keep the project running until the first validation session. In other words, presales have their advantages (covering implementation costs) and their drawbacks (lower credit prices, high risks, problems with setting the value of the credit, etc.).

It should be remembered that the price per tCO_2e also varies with the type of investor and their objectives.

The following indications may be useful:

- In their 2009 report, Ecosystem Marketplace and New Carbon Finance gave an average 2008 price of 6.3 US$/$tCO_2e$ for credits from voluntary projects for avoided deforestation.
- In their 2009 survey, *Ecosecurities et al.* found that 29% of companies are prepared to pay 10 to 12US$ per forest carbon credit.

36. Examples are: Ecosecurities et al. (2009), *Forest Carbon Survey*, World Bank (2009), *State and Trends of the Carbon Market*, Ecosystem market place et New Carbon Finance (2009), *State of the Voluntary Carbon Markets*.
37. These different methods are described in Chenost *et al.* (2010), *Bringing Forest Carbon Projects to the Markets*, p.128.

- In 2009, REDD+ credits were not perceived as a safe haven for investments in the context of economic downturn, which, as underlined by the World Bank's *State and Trends of the Voluntary Markets 2010*, lowered their average price to 2.9 US$.

• Taxation and legislation on REDD+ project income

It goes without saying that REDD+ projects are subject to the forest and tax laws of their host country. This influences not only carbon credit ownership rights (see Chapter 3), but also the type and rate of taxes on project income.
Very few countries have passed legislation on these points and there are many unanswered questions:

- On what basis is the tax calculated? (carbon units generated or carbon units sold?)
- Does the government tax a percentage of the credits, a percentage of the income or the net income?
- When, how often and by whom are taxes levied?
- Etc.

Each project developer will need to investigate the legal context of the project's host country, and if no clear legislation exists, obtain a reply or an agreement from the competent authorities.
In order to gauge the project's net income, once these taxes have been assessed, they will have to be removed from the generated income according to the effective way they'll have to be spread over time.

• Other income

In REDD+ projects and all carbon related forest projects in general, carbon income does not necessarily account for 100% of project income; some REDD+ activities can generate commercial earnings, which must be included in the financial analysis.
These earnings depend entirely on the project and on the activities it develops. Income may be from sales of non-timber forest products (NTFP), wood products from sustainably managed forests (especially in IFM projects), ecotourism, etc.

1.2 - Identifying and analysing the costs of a REDD+ project

Like other forest projects generating carbon value, REDD+ projects involve costs of two types:

- **transaction costs** or carbon costs, and
- **implementation costs.**

• Transaction costs estimation and breakdown

Transaction costs are all the expenses incurred to gain access to the carbon markets. A review of the literature shows that these costs vary considerably from one project to the other and that in many cases they can only be cost forecasts because the certification and operational phases have not yet begun.

There are two kinds of transaction costs:

- the costs of developing the project's carbon component, which are the costs incurred to meet REDD+ methodological requirements, and

- the costs of certifying and selling the credits, which are transaction costs in the strict sense, i.e. all costs arising from the process of certifying the project and its credits and from the sale of these credits.

Tables 6.1 and 6.2 give an indication of these different costs. Whenever this was possible and documented, we have given a price range or an indicative price.

Table 6.1
Costs incurred in developing the carbon component of a project

Phase	Description	Factor(s) of price sensitivity	Frequency	Price range
Pre-feasibility	Identification of the zone, conceptualisation, preliminary studies, … **Output for validation: PIN**	• Project history • Available data • Human and technical resources • (Low sensitivity to the project size)	Once	10 - 50k€
Feasibility	Analysis of methodologies, full studies, development of baseline and project scenarios, project design (boundaries, activities, organizational structure, etc.), monitoring plan, … **Output for validation: PDD**	• Available data (satellite imagery, socio-economic studies, etc.) • Methodological choices and landscape • Human and technical resources • (Medium sensitivity to the project)	Once	50 - 300k€*
	Revision or development of a new methodology (optional) **Output for validation: Méthodology**	• Methodological landscape • Human and technical resources • Methodological choices • (No cost sensitivity to the project size)	Once	50 - 200k€
Operations	Emission reductions monitoring**, etc **Output for validation: Monitoring report**	• Human and technical resources • Methodological choices • (High cost sensitivity to the project)	Variable***	0.38€ /ha - 6.45€ /ha ****

* Some PDDs may be much more costly than others, depending in particular on methodological choices. For example, building up a projected baseline scenario with expensive high resolution satellite data (e.g. SPOT) will be more costly than a historic baseline scenario built up from free-access medium resolution imagery (e.g. Landsat).
** NB: these costs are only for biomass and forest cover monitoring. They are detailed in the next tables.
*** Depending on the standard selected.
**** Böttcher et al. 2009, converted into euros at 1€=1.4647U$. Includes costs of remote sensing data purchase and interpretation (0.0034€/ha < - > 5.08€/ha) and biomass inventory costs (0.38€/ha > - < 1.37€/ha).

Sources: Chenost *et al.* 2010, WCS *et al.* 2009, Böttcher *et al.* 2009

Table 6.2 - Costs for credit certification and sales

Phase	Description	Factor(s) sensitivity	Frequency		Cost*
Validation	Project validation by an independent entity that is accredited by the selected standard	• Selected standard • Verification agency	VCS CCBs Plan Vivo	Once 5-yearly Once	40 - 50k€ 8,535€*
Verification	Verification of emission reductions by an independent third party with accreditation from the selected standard or by the standard itself	• Selected standard • Verification agency	VCS Plan Vivo	5-yearly (encouraged) Annual	30 - 50k€ 0.12€/ certificate*
Registration	Account to be opened for the developer and the project	• Determined on a case-by-case basis by the registry	VCS	Once	-
Credit issuance	Payment of credit registration costs in the registry	• Selected standard • Additional fees levied by the registry	VCS Plan vivo	Per VCU generated Per certificate generated	0.034€/ VCUs + 0.05€/ VCUs 0.12€/ certificate*
Sales	Definition of legal ownership of credits and contracts (ERPA)	• Cost of legal expertise	Variable		5 - 40 k€
	Brokerage costs	• Type of service	Variable		3 - 10% of VERs

Source: Plan Vivo 2008, VCS 2008, WCS *et al.* Chenost, C. *et al.* 2010
* Source data converted into euros at an exchange rate of 1€= 1.4647 US$

Besides the size and type of the project, development costs for the carbon component will mainly depend on:

- The **project's history**:
- *Does the project build on an existing initiative or do partners need to be identified and involved? Can the existing initiative be readily transformed into a carbon initiative? Etc.*
- The quality and quantity of **available data**:
- *What data already exist? Are they reliable and usable? What other data need to be produced? Etc.*

- The **methodological landscape**:
- *Is there a usable REDD+ methodology for the project context? Does a new one need to be developed? Does an existing one need to be amended? Etc.*
- The **human and technical resources** available to the project developer:
- *Does the developer have the internal qualifications required to handle the methodological issues? Should this be subcontracted to a consultancy? Does the region or country have the necessary expertise? Etc.*
- The **methodological choices made** for the project:
- *Historic or projected baseline scenario? Size of the reference zone? Duration of the reference period? Design of the biomass monitoring protocol? Etc.*

Similarly, the registration, validation and certification costs for the project and the credits will depend on:

- **The** chosen **standard**:
- *What is the validation process required by the standard? What documents need to be supplied? Are there any associated costs such as registration fees? Etc.*
- The **verification/certification** agency chosen for the verification process:
- *What are their prices?*

On this topic, it is interesting to note that:

- The Plan Vivo standard considers that validation / verification costs should not exceed 18'000€ [38] and levies a fee of 0.51€ per Plan Vivo certificate generated, to cover registration and issuing costs [39].
- The VCS indicates that validation/verification costs are freely determined by the certification bodies [40], who usually do not have fixed prices but provide case-by-case estimates.
- The VCS-accredited registry managers determine, on a case-by-case basis, the cost of opening an account for the developer and for the project [41].
- The VCS levies a fee of 0.04€/ VCU generated to cover registration costs [42].

• Monitoring costs

So that generated emission reductions can be successfully verified, the REDD+ project must develop a robust monitoring plan together with a quality assurance system (see Chapter 4).

The project monitoring process will involve various costs that depend mainly on:

- the size of the project;
- the type of images used and associated interpretation and mapping costs;
- the design of the monitoring protocol and the cost of fieldwork.

38. 12,500 US$, converted into euros at 1€ = 1.4647 US$ - http://planvivo.org.34spreview.com/wp-content/uploads/The-Plan-Vivo-Project-Registration-Process-Step-by-step-guide.pdf
39. 0.35US$, converted into euros at 1€ = 1.4647 US$ - http://www.planvivo.org/wp-content/uploads/Project-development-cost-and-timeline-spreadsheet-2009.pdf
40. http://www.v-c-s.org/faq.html#question54
41. http://www.v-c-s.org/faq.html#question612
42. http://www.v-c-s.org/faq.html#question613

Costs for carbon and forest cover monitoring will be for[43]:

1. purchasing **satellite images**,
2. **interpreting the images** and mapping,
3. **biomass inventories** (in theory, the initial inventory will cost more than subsequent monitoring inventories, which may focus on a representative sample of permanent plots)

Böttcher *et al.* (2009) give several examples from the literature to compare biomass inventory costs at national and at REDD+ project scales (table 6.3), as well as costs of acquiring and interpreting satellite imagery according to the technology used (table 6.4).

Table 6.3 – Examples of biomass inventory costs (adapted from Böttcher *et al.* 2009)

Project, country	Area	Average cost
Noel Kempff, Bolivia	634,000 ha	0.37€/ha
Project in the US	18,000 ha	1.14€/ha
Private Forestry Project, Costa Rica	57,000 ha	0.68€/ha
Indian National Forest and additional biomass assessment	Indian forests area (> 67M ha)	< 0.07€/ha
National Forest Monitoring and assessment	Forest areas in 5 countries (Zambia, Honduras, Nicaragua, Bangladesh and Cameroon)	0.08 – 0.56€/ha
Ulu Masen Project, Indonesia	750,000 ha	0.55 – 1.36€/ha

Source data converted into euros at an exchange rate of 1€= 1.4647 US$

• Estimation and breakdown of implementation costs

At project scale, costs arising from the implementation of REDD+ initiatives represent all the expenses incurred in order to reduce deforestation in the project zone, in accordance with a strategy of rights of individuals respect, good governance and risks of leakage and non-permanence reduction. Depending on each project, this will include financing of activities, administrative costs, costs of securing land titles, developing a benefit-sharing system, costs of monitoring co-benefits, etc. These costs are generally referred to as capital expenditures (CAPEX) and operational expenditures (OPEX). Capital expenditures are all the initial expenses incurred to launch the project (for example, costs of acquiring or exploiting the land, infrastructure costs, etc.). They must usually be paid in the first project years so that activities can take place. Operating expenditures cover expenses over time, which are often recurrent and needed to sustain the project activities (salaries for project teams, for example).

These costs are influenced first and foremost by the choice and development of activities to be implemented, which will depend directly and closely on the profile of the agents and drivers of deforestation. Apart from the activities themselves, a number of additional factors will have an impact on the way activities are implemented and will therefore indirectly influence their cost (figure 6.2).

43. For more details on the monitoring process, see Chapter 4.

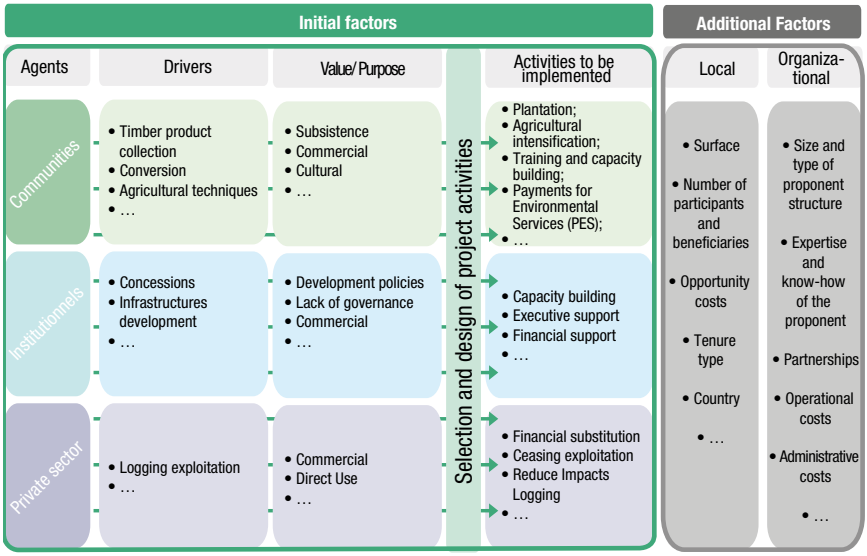
Table 6.4 - Examples of acquisition and interpretation costs according to technology (adapted from Böttcher *et al.* 2009)

Satellite and sensor	Acquisition costs (/ha)	Interpretation costs (/ha)	Total cost/ ha
Optical, medium resolution (15 - 32 m)			
Landsat-5, TM	0.003 €	0.76 € < - > 1.35 €*	0.76 € < - > 1.77 €
Landsat-7, TM+	0.0045 €		
SPOT 4	0.003 €		
Terra ASTER	Free in Brazil		
CBERS-2, HRCCD	0.0006 €		
IRS-P6-LISS III	0.001 €	0.0073 €	0.0083 €
Optical, high resolution (3 - 20 m)			
Quickbird	0.37 €	0.10 € < - > 0.15 €	0.11 € < - > 0.52 €
Ikonos	0.37 €		
RapidEye	0.041 €		
SPOT 5, HRVIR	0.009 €		
Optical, very high resolution (< 1m)			
Quickbird	0.23 € < - > 0.32 €	3.8 € < - > 5.5 €	4 € < - > 5.8 €
WorldView-I			
Radar, SAR (Synthetic Aperture Radar)			
ALOS PALSAR	0.0006 €	0.10 € < - > 0.15 €	0.10 € < - > 0.15 €
Satellite or onboard SAR	0.002 €		
Airborne SAR	5.05 €		> 5.05 €**

Source: Böttcher *et al.* 2009

Source data have been converted into euros at an exchange rate of 1€ = 1.4647 US$.
* Interpretation costs including stratification and detection of changes.
** Böttcher *et al*. give several examples of costs for an airborne Lidar. These vary with the area to be covered (for a forest inventory at project scale in Indonesia, the article gives image acquisition costs of around 5.8€ to 8€ per ha, with 160 hours of processing).

Figure 6.b -
Factors influencing the implementation costs of REDD+ projects



To estimate and spread implementation costs over time, developers must have a clear and detailed idea of the activities and how they are to be put in place. In the early project stages, it is often difficult to estimate precisely and definitively capital and operational expenditures, and to detail all planed activities in order to determine the type of expenditures that will be required (person/months, supplies, etc.) as well as the frequency and amounts of the necessary disbursements. To avoid too great a difference between provisional estimations and actual costs, price estimations should be based, as best as possible, on local information backed by supporting documentation or actual experience.

Beyond this financial aspect, the development of activities and how they will be implemented are fundamental to all projects. An in-depth analysis of deforestation agents and drivers is essential to develop activities that will effectively reduce deforestation. How they will be implemented will depend not only on factors directly associated with the project perimeter (area, number of people affected, land titles, etc.), but also on the organisation chart developed for the project. Therefore, developers must anticipate the organisational issues that may arise and make as much progress as possible in preparing robust partnership and cooperation agreements. Chapters 2 and 3 of this guide describe key points to address in both these phases.
Estimating the implementation costs of a REDD+ project will only be feasible once the activities have been identified and their implementation charted, even if only on a provisional basis. These costs should be spread over time in accordance with the identified disbursement periods.

Box 6.5
Analysing REDD+ opportunity costs

There is a relatively large amount of literature on estimating the costs of avoiding deforestation. In most cases, the figures given are for transaction costs and the so-called opportunity costs of avoiding deforestation. Depending on the models used for the calculations (empirical and local, empirical and global or global simulations), authors give opportunity costs per tonne of CO_2e in the range o f 1.74 to 5.22 US$ (Boucher, 2008).

Opportunity costs, also referred to as option costs, are the loss of income or assets that are forfeited by adopting a different strategy, in other words the cost of something which is estimated in terms of unfulfilled opportunity. In the case of REDD+, this cost is the money the forest would have generated without the project and in accordance with a deforestation scenario. It may be deduced from this that a REDD+ project must generate, for those project participants who cease their deforestation activities, stable long-term incomes that are higher than the opportunity cost (Wertz-Kanounnikoff, 2008). However, there may be other criteria concerning the agents of deforestation, such as the opportunity of abandoning illegal practices.

The opportunity cost is therefore an important indicator but which cannot be directly extrapolated to work out project implementation costs, except in a few special cases such as the REDD+ Forests project in Tasmania (see case study in Annex 4).

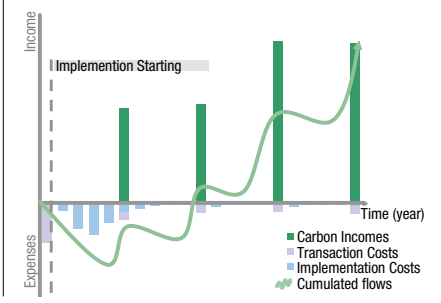
1.3 - Calculating and discounting net income from a REDD+ project

• Cash flow model for a theoretical REDD+

Once the REDD+ project income and expenses have been assessed, an aggregation of yearly results will produce the project's anticipated net income. Real net flows can then be calculated by applying current tax rates in the country where the credits are to be sold. This will produce a cash flow model for the project (figure 6.c), which should show the real flows generated by the project throughout its duration and therefore give a clear idea of how anticipated expenditures and incomes will be spread over time.

Developers may be tempted to see the curve of cumulative flows as representing the reimbursement of expenditures and, in the theoretical project shown in figure 6.c, an effective return on investment at the end of the project's 10th year. However this would ignore an essential factor in calibrating costs, i.e., depreciation over time.

Figure 6.c - Cash flow model for a theoretical REDD+



Source: ONFI - Only carbon incomes are considered here. For a project where activities generate other income, these must be added to the cash flow model.

Box 6.6
Determining the discount rate for a REDD+ project

The discount rate calculation has to be based not only on value over time but also on the yields demanded by investors in return for the investment risk. The riskier the investment, the sooner the investor will want to recover the outlay and the higher the discount rate will have to be. The following must be taken into account to determine the discount rate for a REDD+ project:

1. **Rate of interest on a risk-free investment:** the money invested in a REDD+ project must yield at least as much as the investor would have obtained by investing money in a "risk-free" interest-bearing account.
2. **Risks related to the market and the national context:** when central banks make loans to other banks, they apply what is known as a "risk-free" interest rate. This central bank rate is used by other banks as their minimum loan rate, and determines the interest rate on "risk-free" interest-bearing accounts. These "risk-free" rates are considered as reflecting market-linked risks and national investment contexts, and may be used as reference values. If no national discounting rate is available, developers may also refer to "low-risk" financial market rates (CAC 40, DOW JONES).
3. **Project-related risks:** investors with a particular interest in co-benefits may sometimes tend to recommend lower discount rates in analysis of forest projects that emphasise social and environmental aspects, on the grounds that some benefits that cannot be quantified in monetary terms justify the use of a lower discount rate than the rate used to assess other projects in the country's overall economy. Given the high levels of risk associated with REDD+ projects (non-permanence, uncertain credit prices, status of international negotiations, etc), it is advisable, on the contrary, to apply a relatively higher rate than the national reference rate, depending on each project.

In all cases, the discount rate defined for the financial analysis must be explicitly justified, especially if it is lower than the norm, which might suggest that the developer is trying to mask an inadequate rate of return. It is always preferable in any case to test the project's sensitivity to discount rate variations.

• Net discounted income

The value of project costs and benefits is closely linked to the passage of time and very dependent on the time when they arise. If all project costs and benefits were to accrue at the same moment in time, the analysis could simply add up the costs on the one hand and the benefits on the other and compare them without further adjustment. However the costs and benefits are spread across the entire project duration, which is usually lengthy in the case of forest projects. The amounts are the same but the difference lies in the time factor and whether stakeholders agree to delayed returns. Spending 10€ today to generate 15€ tomorrow is likely to be acceptable, but not if the 15€ are only recovered after 40 years.

Box 6.7 - Theoretical case study: assessing and discounting net income in a REDD+ project

The project is the same as the one used in Box 6.4 and figure 6.3. The transaction costs have been quantified using the average values in Tables 6.1 and 6.2. The implementation costs have been calculated on the basis of ONF International assessments of its own projects.

			Project duration (20 years)		
		Year 0	+1 year	+2 years	+3 years
	VCUs generated				
	Income (€)				
	Costs (€)	425,000	87,340	275,237	338,424
	Net income after tax (€)	-425,000	-87,340	-275,237	-338,423
10%	Net discounted income	-425,000	-79,400	-227,468	-254,262
	NPV**	202,202			
8%	Net discounted income	-425,000	-80,870	-235,971	-268,651
	NPV**	478,415			
	IRR**	11.96%			

*As opposed to the table in box F4, years 10, 15 and 20 in this table are given annually and not cumulatively.
** NPV and IRR are explained in the next chapter.

To make an *ex-ante* assessment of the project's financial viability, a way needs to be determined to make a value arising after *n* years equal to a present value *(Year 0*).

In financial accounting, the method is to apply an adjustment factor to the values of net future costs and benefits, which will reflect their present value and will therefore depend on the agreed value of the money over time. This factor is called the **discount rate**, and the process of applying it is known as **discounting**.

Transaction costs:	PIN: 30,000€, Year 0 PDD: 175,000€, Year 0 Methodology: 175 000€, Year 0 Monitoring: (0.875€/ha for inventory + 1.87€/ha for data acquisition and processing) every 5 years	Validation: 45,000€, Year 0 Verification: 40,000 every 5 years Registration: - Credit issuance: 0.034€/ VCU + 0.05€/VCU registry fee
Implementation costs:	Capital: 1,015,071€ spread over the first 5 years Operating costs: 402,570€ spread over the next 15 years	
Discount rate:	8 to 10%	
Tax on net income:	10%	

Project duration (20 years)					
+4 years	**+5 years**	**+6 years**	**+10 years ***	**+15 years ***	**+20 years ***
	243,880		395,112	417,873	412,978
	999,908		1,619,959	1,713,281	1,693,209
206,892	250,015	66,382	183,828	177,185	193,005
-206,891	674904	-66,381	1,292,517	1,382,486	1,350,183
-141,309	419,062	-37,470	498,321	330,956	200,696
-152,071	459,328	-41,831	598,685	435,817	289,679

There is no exact value or set formula or other automatic way of calculating a project's discount rate. The financial analyst will have to define an appropriate discount rate for each project (Box 6.6).

The discount rate calculated will apply to net income considered annually and will produce what is known as the net discounted income, which means, for each project year, the intrinsic value of its costs and benefits in terms of their present value. This aspect is fundamental to REDD+ projects because they only generate profits after several years of investment. Income therefore must be high enough to cover both the costs and discounted income.

2 Assessing financial feasibility and analysing economic efficiency

Because financial analysis requires financial flows to be identified, detailed and spread over the time and thereby allows costs and income to be monitored, the process is an excellent planning tool for REDD+ projects. For investors seeking a return on their investments, financial analysis should bring out criteria to support their decisions, despite the approximations inherent to financial flow forecasts. For REDD+ project developers, financial analysis provides an overall picture of the project and helps to give clear answers to questions that investors might raise.

There are several indicators to assess the financial viability of projects and/or to make comparisons between different projects. However, these indicators only provide partial information on results and must be combined to avoid any gaps in the analysis. Two of these indicators are widely used in financial and economic analyses:

- the **Net Present Value (NPV)**, and
- the **Internal Rate of Return (IRR)**.

• Net Present Value

The Net Present Value (NPV) is the net surplus benefit generated by the project expressed in present value. It is used as a basis to work out the ultimate yield of the project and is calculated simply by adding up all net discounted income.

A positive NPV means that the project will ultimately yield higher returns on the amount invested than a financial investment of the same amount, at a rate equal to the discount rate. To simplify, it is generally understood that a positive NPV indicates that the project is profitable, that it will generate positive flows and will therefore be selected.

Conversely, if the NPV is negative, the project will be considered unprofitable and will likely be rejected by an investor seeking a return on investment.

The NPV is a fundamental criterion in economic calculations. It is generally used to compare the yields of two projects; the project with the higher NPV being considered the most profitable.

Two criticisms can be made, however:

- First, the NPV cannot be used to compare projects of very different durations (Box 6.8).
- Second, it is highly dependent on the discounting rate, which, as we have just seen, is both arbitrary and difficult to determine. The table in Box 6.7 shows how variations in an 8-10% discounting rate can double the NPV. This is why a financial assessment should never be based on the NPV alone; it is often combined with the IRR, which has the advantage of reflecting an intrinsic project value.

• The Internal Rate of Return

The IRR is the discount rate that would make the discounted value of the project benefits equal to the discounted value of its costs. In other words, the IRR is equivalent to the discount rate that would cancel out the project's NPV. It is mainly an equilibrium ratio in that the discounted value of the benefits balances the discounted value of the costs.

Box 6.8 - Equivalent Annual Value (EAV)

The EAV can be used to make financial comparisons between projects of different durations. This is another profitability indicator which is based on the value of annual discounted flows, the discounting rate or a minimum acceptable rate of return (MARR) and the number of years covered by the project. The EAV is calculated by converting monetary flows into a series of data evenly distributed over the duration of the project being assessed.

If the project has an IRR of 10%, investors will receive 0.10€ per year for each euro invested during the project's lifetime[44]. This indication is useful for investors as it enables them to compare two possible uses of their funds.

The project is considered to be profitable if its IRR is:

- higher than the IRR found empirically in the project sector in question (empirical approach),
- higher than current financial interest rates (financial approach).

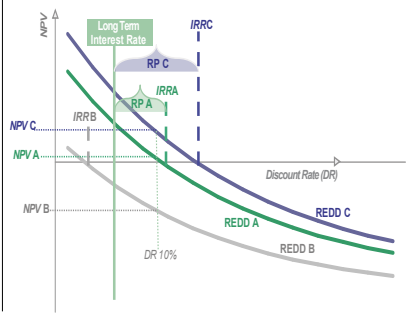
A comparison between the IRR and financial interest rates will answer a simple question: will there be more to gain from investing in the project or from making a "risk-free" investment? Clearly, investors are unlikely to invest in a REDD+ project if it will yield less than a risk-free investment.

Figure 6.d compares three types of projects:

- REDD+ A is the theoretical project analysed in the previous tables (tax on net income =10%);
- REDD+ B is the same project with a higher rate of net income taxation (30%);
- REDD+ C is again the same project without income taxation and therefore yielding maximum income.

The curves show the NPV according to the discount rate.
Not surprisingly, project C has the highest NPV and project B has the lowest.
The IRR for project B is lower than the bank rate, and a risk-free investment is therefore more profitable than investing in project B. Conversely, the IRRs for projects A and C are higher than the bank rate. The difference between the bank rate and the IRRs for A and C corresponds to the risk premium for each of these projects.

Figure 6.d - The Internal Rate of Return



44. This euro equivalent is valid only for projects analysed in European currency. 1€ should obviously replaced by 1US$ if the project is in US currency.

The IRR has the advantage of being project-specific and not dependent on the discount rate, unlike the NPV, however, it is a mathematical tool with no real financial significance, and it depends instead on the assumption that financial flows from the operational phase are reinvested at the same rate. If, when comparing two projects, the IRR and NPV lead to different conclusions, the NPV should be the preferred criterion. Also, it is not always possible to determine the IRR, either because the NPV(IRR)=0 equation cannot be solved, or because it has several solutions.

If possible, both the NPV and IRR should be used in the financial analysis to inform any subsequent decisions on the project as accurately as possible.

• Financial characteristics of REDD+ projects

REDD+ projects have several characteristic features that must be taken into account during financial analysis:

- Projects require **initial investments that can be costly**. As explained above, implementation costs vary widely from one project to another and may be very substantial in some cases.
- **The first carbon credits will only be generated after emission reductions have been verified**, i.e., after the first monitoring and verification session. Depending on investment costs, project size and emission reductions actually achieved, the project may not yield any returns for several years. However, this can take less time with a REDD+ project than with other forestry projects such as afforestation and/or reforestation, which have to wait for some time before they can use the first timber products and/or the first carbon credits. Because of the initial investment cost and the time that elapses before the first credit issuance, projects often sign sales agreements in which the investor undertakes to finance project implementation or transaction costs in return for reimbursement from sales of the credits subsequently generated. These agreements need to be formalised through specific contracts and demand careful analysis by the stakeholders. In particular, it is crucial to anticipate future national REDD+ strategies that may categorically define the ownership of carbon credits generated by REDD+, and include the relevant government authorities in these agreements.
- **Transaction costs (carbon component development and certification) are relatively high** and in some cases (when implementation costs are low), they may absorb a significant share of the investment outlay (see case study on the REDD Forests project in Tasmania in Annex 4). For small-scale forest projects, the leveraging effect of the carbon credits may not be very great, which is also true for projects with low emission reduction potential (where the baseline scenario gives a low rate of deforestation and/or deforestation factors that are difficult to curb). The balance between a project's impact on climate and its financial feasibility is delicate and should, as far as possible, be considered from the outset of project development. As the

development of a PDD (and therefore of the baseline scenario, strictly speaking) is costly in itself, it is important to conduct a pre-feasibility study or an opportunity analysis to ensure the project's characteristics are promising.

- **Carbon income may be associated with other types of commercial income** that can improve the project's financial feasibility prospects. This is the case with timber or non-timber products. In IFM projects, carbon income is additional to operating income and will thus improve longer-term financial feasibility.
- **REDD+ projects carry a high level of risk.** These are long-term projects subject to a whole series of technical risks (natural hazards, etc.), financial risks (market volatility, lack of visibility and liquidity on the carbon market, especially for forest carbon credits, etc.) and institutional risks (projects in countries that are unstable, with changing legislation, high levels of corruption, etc.), to which current risks must be added in connection with implementation of the mechanism at the international and national scale. The fact that REDD+ methodologies are still in the process of validation increases investment risks. Projects based on a non-validated version of the methodology may encounter problems, including a complete overhaul of the PDD if substantial changes are made during validation of the chosen methodology. For investors, this high level of risk is reflected in high discount rates for projects of this type (and therefore a lower NPV), resulting in demands for high internal rates of return (IRR). Consequently, the financial indicators (IRR, NPV) are usually less favourable than in other sectors.
- **REDD+ projects generate additional social and environmental benefits**, which – if they are not commercial – can be supported financially through public subsidies, donations, preferential loans, etc. These positive externalities may be included in the "return on investments", as they can improve the financial indicators (IRR, NPV) of projects because they do not usually demand a commercial return on investments.

The financial analysis must take these characteristic features of REDD+ projects into account. It must also be supported by a sensitivity analysis that covers trends in profitability indicators in accordance with different income and expenditure scenarios as well as previously formulated assumptions.

• The sensitivity analysis

Depending on the risks specific to each project and the context in which it is implemented, simulations of several different scenarios will be necessary.

These simulations may include:

- An increase in transaction or implementation costs
- A drop in carbon income (lower prices for credits, decline in credit quantities)
- A delay in implementation that postpones the sale of credits
- A shorter project duration

For carbon projects generally and REDD+ projects in particular, it is important to measure the impact of an increase in credit prices on the project's profitability, depending on market fluctuations observed. For example, a project developed in a country where labour costs are highly variable should analyse the impact of an increase in labour costs and OPEX.

A well-conducted sensitivity analysis should answer two crucial questions:

- *What are the variables to which project yields are most sensitive?*
- *What probable scenarios would cancel out the project's profitability?*

The assumptions to be tested will depend on risks specific to the project (see Box 6.9). Over-sensitivity to costs and income is a sign of financial fragility. To ensure that investments are secure, risks should as far as possible be insured against through contracts.

Box 6.8
Analysis of financial yield sensitivity in a REDD+ project

The project is the same as the example in Boxes 6.4 and 6.7. The four scenarios are based on discount rates of 10% and 8%.

Scenario 1: 10% discount rate and 10% drop in VCU prices
Scenario 2: 10% drop in the VCU volume generated
Scenario 3: 10% increase in project investment costs
Scenario 4: 10% in project operating costs

		Scenario 1	Scenario 2	Scenario 3	Scenario 4
10%	Initial NPV	202,202			
	Revised NPV	34,736	34,066	125,969	188,376
8%	Initial NPV	478,415			
	Revised NPV	273,457	272,637	398,094	461,728
	Initial IRR	11.96%			
	Revised IRR	10.35%	10.34%	11.18%	11.83%

Box 6.9 – The main risks in REDD+ projects

Many areas of sensitivity can be insured against through contracts to reduce the level of risk. This is the case, for example, with credit purchasing and sale contracts that establish prices and volumes traded between the parties. The table below shows the main risks encountered when developing and implementing REDD+ projects that require particular attention. Some of these risks concern all types of projects; others are specific to forest carbon projects and REDD+ projects.

	Risk types	Examples
Traditional risks	Non-commercial risks	• Political and institutional instability in the host country • Economic and monetary instability (inflation, devaluation, etc.)
	Risks arising from poor project execution	• Technical or financial default by one or more participants • Non-compliance with national regulations • Withdrawal of one or more stakeholders, or non-execution of some, or all, of their commitments
	Risks arising from poor contract execution	• Fewer credits issued than anticipated • Lower price • Withdrawal of a buyer
"Forest carbon" and REDD+ project risks	Risks in connection with the carbon instrument and the national REDD+ strategy	• Rejection of the methodology • Non-registration with the standard • Substantial changes in methodologies in the process of validation that may compromise project feasibility (e.g. rejection during first validation of ADP methodology, of the "projected" approach to establish the baseline scenario) • Adoption of a national REDD+ strategy that is detrimental to the project and possibly to all initiatives at project scale (in regards to trading credits)
	Non-permanence risks	• Natural risks (fire, etc.) • Human risks (project rejected by agents of deforestation)
	Risks in connection with the ownership of carbon credits	• Land title regimes • National position
	Leakage risks	• Risk of deforestation shifting to a zone more or less adjacent to the project
	Market risks	• Lack of liquidity, volatility on markets for forest carbon credits and especially credits from REDD+ projects • Lack of long-term market visibility • Major price fluctuations

Source: adapted from Chenost, C. *et al.* 2010.

• From financial analysis to economic analysis

Besides the more or less explicit safeguards in the Copenhagen "REDD+ non-paper"[45], many REDD+ projects have, or have set forth, additional socio-economic and environmental benefits. Although they strictly speaking cannot be given any commercial value, these positive externalities are still a major factor in project development that can help raise initial financing and investment [46]. They may be given a value *via* public support and/or subsidies or environmental patronage.

To estimate these benefits reliably, it can be useful to analyse the project's economic efficiency. While financial analysis focuses on the investor and the profits generated by selling carbon credits[47], the economic analysis takes a broader view by investigating all of the project's economic impacts for all stakeholders. Thus, the economic efficiency analysis of a REDD+ project will be an indicator of its wider economic benefits.

Moving from the financial analysis to the economic analysis requires consolidation of the accounts of all agents on which the project will have a significant impact. This is an aggregation technique that will sum up, in a single account, all of the trade flows between agents concerned by the project and the rest of the economy. All flows corresponding to transfers between agents (inflows and outflows) will subsequently be removed to avoid double accounting.

Among existing methods of economic analysis, the "shadow price" method deserves mention. As with financial analysis, "shadow price" involves determining whether the project's benefits exceed its costs, but in this case from the collective point of view of all concerned (see box 6.10).

3 Financing a REDD+ project

REDD+ projects can use different public, private or even philanthropic levers to raise funds, and rarely use only one lever to cover all project costs. Financing methods available today for REDD+ projects are heavily influenced by the context in which the mechanism is still developing, which is aggravating investment risks. The many environmental and social externalities in REDD+ projects give them access to environmental patronage funding and increase levels of interest in voluntary offsets. Besides these positive externalities and the public interest criteria satisfied by REDD+ projects, the demonstrative nature of projects now being developed can secure public financing as well as financing from bilateral and multilateral cooperation programmes

45. See Chapter 5.
46. *Ibid.*
47. For a detailed analysis of how credit ownership rights are determined, see Chapter 3 on organizational requirements.

Box 6.10
The "shadow price" or reference price method

1. Correcting for taxes, subsidies and other transfers

Payments made but not matched by any real flow of resources in return must be deducted from the financial analysis. This means that all indirect taxes and subsidies received or paid by the project, and representing transfers only, must be deducted. However, prices must include direct taxes. Taxes are sometimes levied to correct externalities (e.g. carbon taxes), and these should be included if the externalities are not taken into account in step 2.

2. Introducing externalities

The purpose here is to take all project costs and benefits into consideration that were not included in the financial analysis. Generally speaking, all costs and benefits that do not concern the project alone and affect other economic agents without financial compensation must be included in the economic assessment. It is nevertheless essential to clearly identify all the project's effects before attempting to value them. Even if some benefits or costs will only become perceptible in the long term and to which it will be difficult to give a value, they still need to be mentioned to aid political or financial decision-making.

3. Price conversion

Financial prices can move away from equilibrium prices as a result of externalities and tax distortions but also because of market imperfections (monopolies, insufficient information, market barriers, etc.). The economic analysis should therefore establish corrective measures to be applied to the financial prices of project inputs and outputs, whether tradable or not. A correction factor is therefore introduced into the analysis matrix to return to the equilibrium price.

4. The social discount rate

Once all project costs and benefits are taken into account, a social discount rate should be applied. This will usually be different to the financial discount rate. The social value of future flows must therefore be investigated in depth, and established by project promoters as they see fit, provided that supporting arguments are clearly explicated. As an indication, the World Bank sets social discount rates at 10%, although this is considered high by national governments who prefer a rate closer to 5%.

• Available financing methods

REDD+ projects can access traditional forms of financing for projects and initiatives, i.e., debt, equity capital, subsidies and donations.

- **Equity capital refers to** capital contributed by investors in return for a share in the special project vehicle (SPV), who thereby become project shareholders entitled to project dividends after other partners have been reimbursed.

  The advantage of equity capital is that it does not need to be reimbursed during the first years of the project, thus releasing cash flow. Moreover, equity capital (unlike debt) can finance projects with a high risk profile.

However, financing with equity capital carries a higher risk than debt financing; shareholders therefore expect higher yields than credit agencies and capital costs are higher.
The main sources of equity capital include the project promoters themselves (e.g., case study on the REDD Forests project in Tasmania) and/or project sponsors, venture capital and private equity funds [48].
Equity capital contributions usually cover only part of the total cost of the project.

- **Debt:** In a REDD+ project, debt will be a sum of money supplied by a third party which must be reimbursed – together with current interest – either during or at the end of the agreed term. The investment risk for the lender, in comparison with equity capital financing, is lower and interest rates are therefore lower also. Debt (or loan) is therefore the cheapest source of capital. On the other hand, the collateral required from project developers can be very high and may involve project assets, which can include sales contracts for products generated by the project, but also guarantees from the project promoter.
  It should be noted that because it is used to finance low-risk projects, debt financing is not easily available for REDD+ projects given the current status of the mechanism.

- **Subsidies:** a subsidy is a sum of money granted by a third party to a project that contributes to the aims of that third party. Subsidies do not usually have to be reimbursed, provided that the stated aim of the subsidy is achieved. Subsidies are provided by government organisations - often under bilateral or multilateral cooperation programmes - and cover a percentage of overall investment in the project.
  Many REDD+ projects receive subsidies, especially for the upstream feasibility and pre-feasibility phases. Some cooperation agencies will withdraw a portion of the subsidy equivalent to the commercial profits subsequently generated by the project [49].

- **Environmental patronage:** private companies with a patronage policy may invest in projects that generate social, environmental, economic or cultural benefits. REDD+ projects can receive – especially through large international NGOs – either financial donations or donations "in kind".
  Some enterprises investing in REDD+ projects do so for voluntary offset purposes only, without necessarily demanding the issue of VERs (*Verified Emission Reduction*), i.e., credits certified by a standard and entered in a dedicated registry. One example is the CCBA-certified Juma project (see case study). This is financed by the Marriott Group through a voluntary offset scheme offered to its clients.

As well as these traditional financing methods, forward sales of carbon credit are increasingly seen as a way of financing REDD+ projects. This can be

48. See Chenost *et al.* 2010, p.97.
49. E.g. KfW for REDD+ project financing.

compared to debt financing. In the business plan, the buyer anticipates that the credit issue will finance the project's implementation. In return, once the credits have been generated, they will be owned, in full or in part, by the buyer. The major advantage of this type of financing is that it covers the initial lack of cash flow characteristic of REDD+ projects, and also that subsequent reimbursements do not have to be made in cash but only in kind (i.e., in carbon credits).
This kind of financing is extremely tempting for project developers. However, it has its own risks and drawbacks; one major drawback is that the buyer will typically expect a substantial discount on the credit sale price in return for the risk taken and the cost of the capital. Nevertheless, it is crucial to remember, in the current REDD+ context, that there is considerable uncertainty in most countries as to the actual ownership of carbon credits. Forward sales of carbon credits demand meticulously drawn-up contracts (see chapter 3) based on close monitoring of decisions made at the national level surrounding the question of the ownership and sale of carbon credits from REDD+ projects. In many cases, the competent authorities will need to be involved in the negotiations and be parties to the forward sale contracts (sometimes as the credit vendor).

• Who will finance a REDD+ project?

Different agencies offer different forms of financing. These are often combined and used for different project phases. They sometimes involve intermediaries and must always be governed by contracts drawn up with meticulous care.

- **The project promoter:** The project promoter or project sponsor(s) very often invest equity capital in the initial project phases (pre-feasibility or feasibility) themselves, but much more rarely in project implementation, which is usually more costly. Nevertheless, some private-sector project promoters may finance the entire project, in which case they fully own and control the project as well as securing carbon credit ownership (in return for contributing capital). The REDD Forests project in Tasmania is a good example of this kind of positioning.
  Other project promoters will prefer a different position, especially if they are not seeking to own credits. This is the case for some NGOs, which finance the upstream phases of projects in order to leverage funds for the subsequent phases. Some project promoters will finance PDD development themselves and even certification in order to enhance their visibility and credibility in the eyes of investors.

- **The private sector:** at present, the private sector is investing in REDD+ projects *via* environmental patronage schemes (donations or preferential loans), by contributing equity capital, or through forward credit sales.
  Financing through environmental patronage, strictly speaking, is usually achieved *via* large international NGOs and proposed with more or less clearly stated voluntary offset objectives. It mainly concerns projects intending to generate a range of social and environmental benefits.
  Equity capital is usually invested in specific phases and may be in the form of a forward sale, in the sense that the investor will require reimbursement

by taking over the title to some of the credits generated. This is the case in the Oddar Meanchey project in Cambodia, for example, which is financed by equity capital from Terra Global Capital. TGC used equity capital to develop the methodology and thus intends to obtain 7% of the future carbon credits (it should be noted that in this project, the owner is the Forest Administration, which is therefore the only agency entitled to sell the credits. In that context, the pre-sales agreements necessarily involved government authorities).
Also to be noted is that voluntary offsetting can be direct (from the investor to the project promoter) or handled by "carbon offsetters", who offer their services as intermediaries between projects and organisations looking for voluntary offset opportunities. Sometimes, like *ex-post* credit sales (after verification), forward sales will take place through these offsetters, acting either as brokers (meaning that they do not buy credits directly but merely act as intermediaries between buyers and vendors) or as traders (meaning that they buy credits themselves to sell them on).

- **The public sector:** because the public sector is able to finance demonstration activities in a business context which is still developing (mechanism under negotiation, national strategies under development, lack of feedback, etc.), it has a fundamental role in financing REDD+ projects. The public sector is often the only source of financing for activities of a particularly demonstrative nature, at a time when the "carbon business" is still facing considerable uncertainty.
  As well as direct financing for demonstration activities and projects in general (loans, donations, investments), Official Development Assistance (ODA) helps to strengthen capacities in host countries, encourages credit purchasing *via* carbon funds, and gives projects access to loans through guarantee funds.
  Several bilateral and multilateral instruments also contribute to the financial feasibility of projects, either through direct financing or through indirect support to project development.

REDD Project in Southern Cardamoms, Cambodia, Wildlife Alliance © WA, ONFI

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NB: The references to standards, especially their URLs, are detailed in the main text and only partly repeated here. Similarly, for the case study bibliography, readers are referred to the annexed case studies.

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Annex 1

Project inventory: Definition of REDD+ projects and methodology

Definition

Before an inventory of REDD+ projects can be drawn up, the scope of REDD+ must first be clarified. As the negotiations stand today, this clarification exercise involves more presupposition than description, and involves some presupposition in regards to the various criteria that can be used to identify REDD+ projects.

In this guide, we have proposed that REDD+ projects should be defined as **initiatives aiming to halt, effectively and in a given defined zone, the dynamics of deforestation and/or forest degradation in order to generate tradable carbon credits, calculated in accordance with an estimated baseline scenario, in exchange for measured, verified and validated avoidance of CO_2 emissions.** Therefore, to be included in the inventory, the projects were assessed against different criteria:

- The activities must be established, or are planned to be established, at the project scale. Sub-national on national initiatives may be included if the activities are, or are planned to be, undertaken to reduce deforestation and forest degradation. However, projects that focus exclusively on the implementation of national, or sub-national policies will not be included in the inventory.
- Generating carbon value (by calculating of CO_2 emissions avoided, offsetting or trading credits resulting from the project) must be an explicit goal.
- The majority of the carbon value must stem from REDD+ activities, and/or the carbon benefits of REDD+ activities must be quantified separately from the other carbon benefits. A number of projects combine energy substitution activities with REDD+ activities, but only those projects that quantify the carbon benefits arising from reducing deforestation and forest degradation are included in the inventory (whereas a project for afforestation/reforestation only will not be included).
- The activities selected will all be REDD+ activities (other than afforestation/reforestation). Projects for Improved Forest Management (IFM) are therefore included in the inventory.
- The project must have reached an advanced stage in identification, meaning that a minimum amount of information on the project must be available (Project Identification Note or equivalent) or that the developer has already engaged in talks with local players (competent local authorities and landowners). Failing this, the project must be referenced with the sources selected (see list of selected sources below).

Methodology

The purpose of the inventory is to list all REDD+ projects that satisfy the criteria given above. To do so, this guide refers to sources and databases for the following:

• Information provided by existing standards

Forestry projects have emerged on the carbon markets together with the development of various quality standards or labels. At present, most of the standards cover the forestry sector. Some of these are open to REDD+ type projects, and of these, a few will actually certify REDD+ projects.

The standards open to REDD+ projects include, in particular, the Voluntary Carbon Standard (VCS), the CCB standards (Climate, Community and Biodiversity), the Chicago Climate Exchange (CCX), the Social Carbon standard, the Plan Vivo standard, the Australian Greenhouse Gas Friendly initiative (AAC) and the American Carbon Registry (ACR). These different standards provide online information on projects already registered or on projects in the process of validation. A review of all existing standards has been made.

• Information provided by the carbon markets

The regulated markets (whether developed under the Kyoto Protocol or not) also provide information on projects. All of these markets have been analysed for this guide. Most of them (except for the EU – ETS during the initial period) account for trade in forest carbon credits (Regional Greenhouse Gas Initiative (RGGI), Western Regional Climate Initiative (WRCAI), Oregon Standard, Californian Climate Action Registry in the United States, and the Australian and New Zealand initiatives). The use of REDD+ credits is very recent and not yet provided for on these markets, although the Californian market deserves attention as it offers possibilities for trading credits from IFM projects included in the REDD+ inventory.

• Information provided by voluntary market operators

In order to draw up a list of projects developed for the voluntary carbon markets and identify those not seeking standardisation, our primary sources of information were the official web sites of operators on the voluntary offset markets. The information obtained was cross-referenced with other available sources (information provided by the Designated National Authorities of non-Annex 1 countries, discussions with experts in the field, interviews with operators).

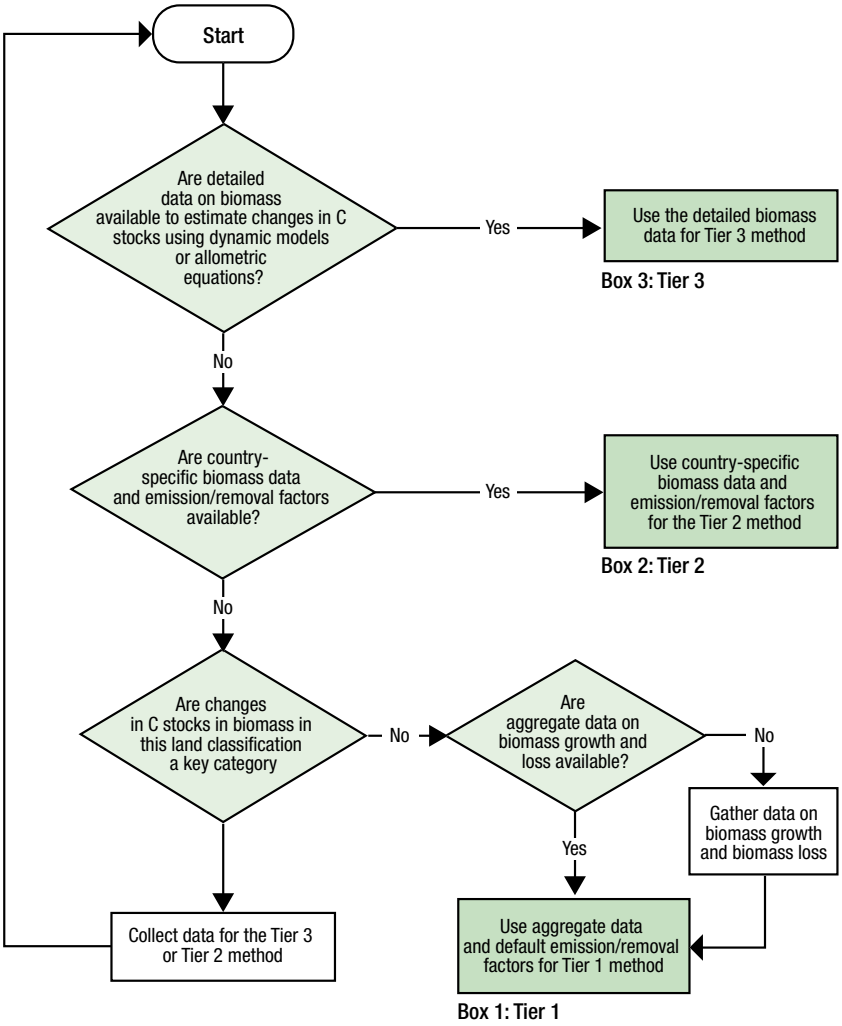
• Cross analysis with databases of forest carbon projects

All of the data produced were cross analysed with existing databases of forest carbon projects. These include the ONF International database (updated to cover studies and projects developed at international level), information communicated by the World Bank's *BioCarbon Fund* and the public *Forest Carbon Portal and Carbon Catalog* databases. We also drew on various studies[1].

1. In particular: Wertz-Kanounnikoff and Kongphan-apirak, Emerging REDD+ - A preliminary survey of demonstration and readiness activities, *Working Paper* n°46, CIFOR, 2009.

Annex 2

Decision tree for the recommended "*Tier* approach"



Name
PROJECT DEVELOPMENT
Selection and delimitation of the project perimeter
• All relevant criteria are taken into account when selecting the project perimeter (carbon potential, co-benefits, financial, political and natural guarantees)
• The project zone has been clearly delimited to reflect the location of agents, the occurrence of drivers and the principle of risk avoidance
Identification of deforestation agents and drivers
• Deforestation agents and drivers, both present and future, have been identified
• Drivers have been ranked and analysed qualitatively and quantitatively
Selection of activities
• The activities have been identified
• They are targeted to specific agents and activities causing deforestation
Estimation of the carbon efficiency of the activities
• The efficiency of the activities have been estimated *ex-ante* to form a basis for the project scenario
• A monitoring plan exists and has been put in place for ex-post verification of the efficiency of project activities
• Possibilities for readjustment have been provided for
ORGANISATIONAL STRUCTURE OF THE REDD+ PROJECT
Identification and analysis of stakeholders
• Local and national stakeholders, whether institutional, political, private-sector or from civil society, have been identified and consulted
• All necessary technical, management and logistic capacities have been secured
Rights to carbon credit ownership have been determined
• The legal nature of the carbon credits has been identified
• All potential rights-holders have been identified
Development of a project organisation chart
• The rights and responsibilities of all concerned have been incorporated into the organisation chart
• Procedures for implementing the activities and redistributing the benefits have been considered and written out as a diagram
Contracts
• Land titles have been secured
• Titles to carbon credit ownership have been secured

Annex 3

Assessment matrix for REDD+ projects (1/2)

Levels of information in each stage			Details
Identification	Feasibility	Implementation	
XX	XXX		
XX	XXX		
XX	XXX		
X	XXX		
X	XXX		
X	XX	XXX	
X	XXX		
	X	XXX	
	XX	XXX	
X	XXX		
X	XX	XXX	
X	XXX		
X	XXX		
	XX	XXX	
	XX	XXX	
X	XX	XXX	
X	XX	XXX	

Name
Impacts on climate change
Demonstration of the project's net positive impact on climate
• The baseline emissions scenario has been conservatively established and complies with the most recent available methodological recommendations
• Leakages have been identified and quantified and mitigation measures are provided for
Non-permanence risk
• A monitoring plan has been established to ensure that emission reductions are permanent
Social and environmental impacts
Assessment of the project's social and environmental impacts
• The initial situation has been analysed and seems to be well understood
• The project's potential impacts have been identified and assessed
Monitoring of social and environmental impacts
• Relevant monitoring indicators have been identified
• A monitoring plan exists and has been put in place locally to verify the project's social and environmental impacts
Certification of the project's social and environmental impacts
• The social and environmental impacts have been certified, or the project has applied for a dedicated standard
Financial and economic assessment of the REDD+ project
Determination of the project's business model
• The project's costs have been identified and analysed
• Income has been identified and analysed
• *A priori*, the project's net income is positive in the long term
Financial feasibility and economic analysis
• The financial indicators are positive
• The project is not over-sensitive to any of the financial criteria used
• The project is economically efficient
Project financing
• The project financing strategy matches the financial structure envisaged
• The project's financial structure, and the benefit redistribution mechanism in particular, take into account all players, the risk-sharing principle, the rights of all concerned and the risks of non-acceptance of the project among different players

Assessment matrix for REDD+ projects (2/2)

Levels of information in each stage			Details
Identification	Feasibility	Implementation	
X	XXX		
X	XXX		
X	XXX		
XX	XXX		
X	XXX		
	XXX		
	X	XXX	
X	XX	XXX	
X	XXX		
X	XXX		
	XXX		
	XXX		
	XXX		
	XXX		
	XX	XXX	
	XX	XXX	

Annex 4

Case studies

Oddar Meanchey REDD Project

Honorable Bun Suluth, a Buddhist monk in charge of one of the forests in the OM Project Area, and His Excellency Ty Sokhun, Head of the Forestry Administration in 2008, review progress in the project area.

Community Forestry
INTERNATIONAL

Project ID	
Location	Cambodia, Oddar Meanchey Province
Size	67,853 ha (60,390 ha of forest)
Duration	30 years (2008-2038)
Used Carbon Methodology/ Tools	"Baseline and Monitoring Methodology for Project Activities that Reduce Emissions from deforestation on Degrading Land" submitted by Terra Global Capital to VCS
Validation/ Certification	CCBA standards (on process), VCS (on process)
Type of Forest	Lowland evergreen, semi-evergreen , dry deciduous forests
Main Deforestation Driver(s)	• Forest clearing for land sales; • Conversion to cropland or to settlements; • Fuel-wood gathering, annual forest fires induced to "clean" the land or hunters inducing forest fires; • Illegal logging for commercial on-sale or timber harvesting for local use; • Large Economic Land and Timber Concessions
Main Deforestation Agent(s)	Migrants, private companies, local communities, soldiers
Project Activities	• Reinforcing land-tenure, Land-use plans • Forest protection, Assisted Natural Regeneration • Fuel-efficient stoves, Mosquito Nets • Agricultural intensification • Water resource development projects • Fire prevention, NTFP Development
Project Benefits	• About 25,000 ha of avoided deforestation aver 30 years (i.e. 7,125 $MtCO_2e$ over 30 yrs) • Local benefits for communities through involvement at all project's phases • Biodiversity conservation and enhancement
Project Proponent	Forestry Administration of the Royal Government of Cambodia - FA
Project Stakeholders	Participating villages, PACT, Children's Development Association, Terra Global Capital, Clinton Climate Initiative, CFI, TWG-F&E
Project Funding	Funding of start-up and validation costs through organizations' support. Self-funding through carbon benefits sale as soon as available.

Project's Description

Organizational Issues

The project area is part of the Permanent Forest Estate (PFE) and therefore under the management of the Forestry Administration (FA). But lands have never been entitled nor have well-demarcated boundaries, and stakeholders struggle to claim forests. The project clarified land tenure and demarcated boundaries through the signature of 9 agreements between communities and FA and 4 additional ones which are expected to follow. While FA remains the land owner, those agreements ensure the explicit and uncontested legal tenures to local communities as well as the land management rights.

Beyond its credits seller position, FA acts as the implementing body and to do so, will be supported by a series of NGOs and partners.

Project Design

Two different forest classes and three different carbon density classes have been identified (evergreen and mixed/deciduous forests Vs mature, medium, low density), that have been summarized into two conservative carbon emission factors: 439 $MtCO_2e$ ha^{-1} from evergreen forest, and 221 $MtCO_2e$ ha^{-1} from mixed/deciduous forest. The Oddar Meanchey province has been pinpointed due to its very high deforestation rate (2,9% for mixed/deciduous forests and 4,2% for evergreen forest), mainly due to intense and increasing demographic density, to unsustainable forest management and to illegal encroachment, destruction or use of forest resources. The project area consists of 13 discrete parcels, in which individual community forests are located ranging from 383 ha to 18,164 ha. To alleviate the deforestation and forest degradation, project proponents will undertake 10 project activities, among which the central question of land tenure clarification process (see Table 2).

Impacts On Climate Change

Baseline deforestation rates in the project area have been extrapolated from historical deforestation in the reference region between 1990 and 2006, by multiplying the average annual rate with a factor representing the difference in areas. The reference region is approximately 10 times larger than the project area (662,000 ha) and is 30% covered by forest; which is considered to be conservative following the relative deforestation rates in the forest transition theory and as the project area is 100% forested. The leakage area was selected to encompass all forests around the project areas that could be under higher pressure during the project lifetime, and taking into account the "cost" that local agents of deforestation need to incur to move their activity. It is assumed that leakage will only occur when the cost to displace the deforestation activity is below a certain threshold or is less than alternative resources. Carbon benefits include a small proportion of Assisted Natural Regeneration (1,26 $MtCO_2e$ over 30 years), which is one of the project activity.

Social & Environmental Impacts

Project includes 58 villages, most of which are coming from highly forest-dependent cultural tradition. It expects to directly benefits local communities by involving them in the design and development of the project, providing them training and support to build forest management capacity, securing the recognition of their management rights, generating carbon revenues for forest restoration, improving farming systems, establishing micro-finance organizations, maintaining access to and use of NTFPs for customary use, etc. Migrants will also be included in the project to avoid the constant increase of deforestation pressure.

The project area can be considered as a High Conservation Value one, for its cultural value but also for its biodiversity richness. Annual participatory monitoring will be exercised on social, economic, institutional, biodiversity, carbon stocks and forest condition indicators.

Financial Issues

Excluding the 12 preparation months, the project will last 30 years. While the first 5 years period will be dedicated to the project establishment and funded by donors, during year 6 to year 30, the project will move into the maintenance period and will be funded by carbon revenues.

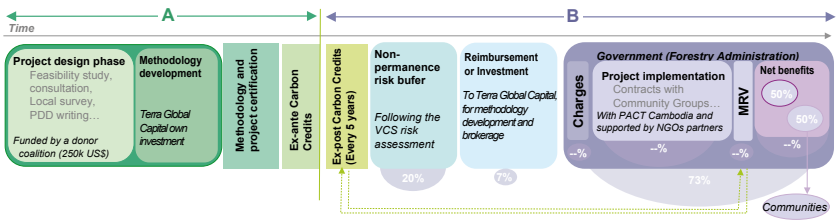
Terra Global Capital will be in charge of the carbon credits brokerage and the Forestry Administration will act as the seller. The Project implementation cost is expected to decrease over the time and net benefits to increase. From the total net benefits, 50% will go to the government and the remaining 50% to the communities through the Community Forestry Management Committees.

Issue to highlight…

"REDD and the national community forestry program"

General Description

The project can be divided into two main periods: the period prior the carbon credits' generation (A) and the effective carbon crediting period (B).



During the Period (A), the pre-implementation phase enabled to prepare and design the project while a REDD methodology was developed to provide tools that are adapted to the project specific context.

The methodology has been submitted to the VCS and the PDD to the CCB Standards. Both are currently under validation process. Following the methodology validation, a PDD will also be submitted to the VCS. When all those steps will be performed ex-ante credits could be pre-sale depending on the funding needs.

The Period (B) is the implementation and effective crediting period. The government will implement the project through contracts signed with Community Forestry Groups and supported by implementation partners. Every 5 years, the MRV process enables to generate ex-post carbon credits that are subjected to buffer deduction, charges and reimbursement payments.

The Project implementation cost is expected to decrease over the time and net benefits to increase. From the total net benefits, 50% will go to the government and the remaining 50% to the communities through the Community Forestry Management Committees.

To retain for other projects….

The Oddar Meanchey project brings to light an essential and interlinked REDD organizational issues: the question of REDD projects' articulation with national REDD and forestry strategies.

The question could be asked to know if REDD fundings should be used to implement pre-existing law that, in the framework of national sovereignty, might have a devoted budget. Beyond this support-Vs-replacement question, the here-adopted organizational diagram enables to set REDD projects' development back in the international negotiations context. If not included in a national strategy, REDD projects - wherever they could be developed - will have to take their host country's position into account and, from non-objection to appropriation, to involve governments into the project development. It does not mean that all projects worldwide have to be namely held by governments, but that proponents will necessarily have to question both the role of governments in the project, and the articulation of the project with existing forestry law. In Oddar Meanchey project, the issue is all the more visible as it is translated into the benefits and responsibilities sharing system, giving an example of how the organizational issues can be addressed in a country where FA has been designated as the REDD responsibility holder.

Partners and Organizational Structure

The project's partners have been and will be differently involved along the project development.

- The project has been initiated by **Community Forestry International (CFI)** in the framework of a 5 years Memorandum of Understanding (MoU) with the Forestry Administration (FA). With the support of a coalition of donors, CFI was the main FA's partner for the Project design phase and will pursue it involvement through research and monitoring work.
- In parallel, **Terra Global Capital (TGC)** had developed a REDD methodology adapted to the Oddar Meanchey context and submitted it to VCS validation. During the first period, TGC is in charge of the technical design of the project (carbon calculations, forest inventory plan, PDD writing and methodology development …) During the Period (B), TGC will act as a broker and be in charge of the monetization and marketing of credits. All over the project, TGC's involvement is self-funded. They signed a MoU with FA to get 7% of the carbon credits.
- **PACT Cambodia, CDA and the associations of local communities** will be the implementing partners. They signed a MoU with the FA to help the implementation of project activities. This part is self-funded by the credits generation.

Other partners have been involved and/or will be involved over the project lifetime for technical support, funding, review, facilitation, advices…: the Clinton Climate Initiative (CCI), Sonnenschein Nath & Rosenthal LLP, the FA's Technical Working Group on Forest and Environment (F&E) and Buddhist Monk's Association.

National Community Forestry Program and REDD

Over the last 5 years, the FA of Cambodia has established the Community Forestry sub-Decree which provides to Community Forestry Management Committees (CFMC), a 15 years (renewable) utilization right of the forest through Community Forestry Agreements. 13 CFMC are participating to the Oddar Meanchey project.

Signing those agreements, the government ensures the explicit and uncontested legal tenure and the land management rights for the local communities. But while the communities have the long term tenure and usage rights of the land, the government still remains its legal owner. Therefore, an additional agreement was signed between communities and the FA, to unambiguously clarify all rights and responsibilities regarding carbon ownership and land usage. CFMC commit to protect the forest thanks to sustainable management and reduced impact practices while the Royal Government of Cambodia acts as a seller of carbon under the ERPA and aggregate on behalf of the CMFC Groups. According to a national commitment on REDD mechanism, at least 50% of the net benefits will be transferred to the communities. This apportionment is expected to increase over the time as implementation costs will decrease with the accrue experience.

Funding

REDD mechanism is here used as a framework to finance a national community-based initiative. In Oddar Meanchey province, carbon finance will support the work of local communities, NGOs and forestry officials to stabilize the forest cover. It brings a long term financing option for the Cambodia's National Community Forestry Program that couldn't succeed without carbon revenues.

For an approximate total of 250'000 US$, the Period (A) of the project has been up-front funded by a coalition of donors including the MacArthur Foundation, DANIDA, DfID, NZAid, CCI and Rockfeller Foundation (around 250'000 US$). These funds have ensured that all start-up costs and the cost of validation of methodology and PDD are funded. In addition, Terra Global Capital developed the REDD methodology on its own funds.

The Period (B) is expected to be self-funded by the net carbon revenues, approximately estimated to reach US$31 million over 30 years.

For the time being, additional potential sources of donor funding are being considered to pursue the field work with communities and start to implement the project. A pre-sale of ex-ante carbon credits will also be needed to avoid the "chicken or the egg" paradox". It is indeed critical to feed the gap between the up-front implementation and the first ex-post carbon credits' generation, following the Monitoring, Reporting and Verification process.

Issue to highlight…

"*Ex-ante* estimate the project effectiveness"

General Description

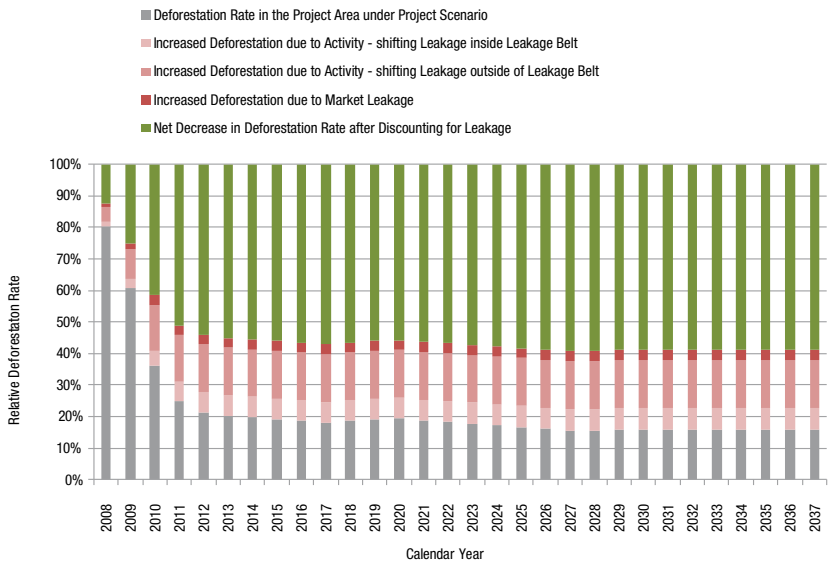
The Oddar Meanchey project is expected to avoid 7,125,046 million metric tons of CO_2 over its 30 years lifetime and to generate between 4,987,532 and 5,700,037 VCU depending on the proportion of the non-permanence risk buffer (30 or 20%).

In order to predict those benefits, the Terra Global Capital REDD methodology detailed the steps of an *ex-ante* estimate of the project deforestation and GHG emissions scenario.

Among other, those steps are:

- The **identification of agents and drivers** of deforestation and forest degradation
- The **assessment of the relative importance** of deforestation and forest degradation drivers
- The **identification and description of activities** to tackle deforestation drivers
- The quantification of the **activities' maximal effectiveness**
- The identification and description of **leakage risks** per driver
- The determination of **leakages extent** (cancellation rate)

Figure 1 - Impact of the Project on Deforestation Rates Inside and Outside the Project Area (Leakages)



To retain for other projects

Beyond the estimated, quantified or determined values, this approach drives to an activities-oriented consideration and formalizes a process to base the project design on the assessment of its effectiveness in terms of GHG emission reductions.

Drivers' Analysis

Thanks to a good knowledge of the area, official and scientific data, local surveys and analysis of the historical deforestation, project developers identified 10 active deforestation drivers that are executed by 6 different agents (see **Table 2**, end of the document).

Migrant encroachment	30%
Conversion to cropland	30%
Conversion to settlements	10%
Fuel-wood gathering	10%
Forest fire to "clean" the land	5%
Hunters inducing forest fires	5%
Illegal logging for commercial on-sale	5%
Timber harvesting for local use	5%
Large Economic land concessions	NR
Timber concessions	NR
Concessions forestières	NR

For each of those drivers, absolute annual carbon loss is estimated using a series of formulas given by the REDD methodology and based on the GPG LULUCF. In a second time, the relative contribution of each driver to the total carbon loss from deforestation and from degradation is also estimated. Finally, the relative importance of the deforestation and forest degradation drivers (*contributionDF(d)*) can be calculated by combining the absolute carbon loss with the relative contribution (see **Table 1**).

Table 1 – Importance proportionnelle des facteurs.

Project scenario deforestation rate

Project proponents identified 10 activities which will be undertaken to achieve reduced degradation and deforestation. Every activity is designed to reduce one or more deforestation drivers to some extent (see **Table 2**). For each activity, a relative degree (*rate(a,t)*) is estimated to translate the fact that effectiveness of each activities changes throughout the project lifetime due to gained experience, or differences in funding (a value of 100% indicates that the activity can't be more efficient in reducing deforestation). Than an absolute effectiveness is estimated to translate the efficiency of the activity a on the driver d (*effectiveness(a,d)*).

$$RelativeProjectImpact_{DF}(t) = \sum_{d=1}^{nrDrivers} RelativeDriverImpact_{DF}(t,d)$$

$$RelativeDriverImpact_{DF}(t,d) = \sum_{a=1}^{nrActivities} \left(rate(a,t) \cdot effectiveness(a,d) \cdot contribution_{DF}(d)\right)$$

The relative reduction in deforestation due to project activities is calculated based on the effectiveness of each project activity to reduce every driver of deforestation and the relative contribution of each driver to the total deforestation. Mathematically, Terra Global Capital translated it as:

relativeprojectimpact$_{DF}$(t)	= impact of all activities on deforestation, relative to the baseline rate during year t
relativedriverimpactDF(t,d)	= relative impact of a driver d on deforestation for year t of the crediting period
nrActivities	= total number of activities, i.e. 10 for OM project
nrDrivers	= total number of drivers, i.e. 10 for OM project
rate(a,t)	= relative degree of activity for activity a, during year t
effectiveness(a,d)	= effectiveness of the activity a to reduce driver d
contributionDF(d)	= relative importance of driver d in deforestation to the total deforestation.

Net changes in deforestation rates under project scenario are calculated by multiplying the relative reduction in deforestation due to project activities with the absolute deforestation rates under the baseline scenario.

Determination of Leakages

Three different kinds of leakages are identified: activity-shifting leakages inside the leakage area, activity-shifting leakages outside the leakage area and market leakages.

For each driver, the risk of leakage is identified and translated into ex-ante estimated cancellation factors (see **Table 3**). Those factors express the driver-specific relative amount of leakage for the amount of deforestation that is avoided.

The net deforestation decrease under the project scenario is calculated relatively to the baseline scenario by subtracting the remaining deforestation under the project scenario due to the fact activities are not 100% efficient) and leakages cancellation rates.

The point of view of…

the project's developer

The Project Proponent

Community Forestry International, Inc. (CFI) assists rural communities to stabilize and regenerate forests by helping policy makers, development agencies, NGOs, and professional foresters create the legal instruments, human resource capacities, and negotiation processes and methods to support resident resource managers. CFI the framework of its activities in Cambodia it has initiate the Oddar Meanchey project that is today hold by the Forestry Administration with the assistance of Terra Global Capital and PACT Cambodia.

Upsides / Advantages

- Opportunity to assess the potential of REDD projects to respond to the needs of forest dependent communities and to inform global REDD agreements.
- Provides strategy and funding structure to avoid deforestation and facilitate natural regeneration, while generating livelihood for 58 participating villages.
- Provides forest tenure security under 15 year renewable stewardship agreements and conserves threatened biodiversity in a region experiencing rapid, landscape level deforestation.

Downsides / Difficulties

- Requires a blending of grant and private sector funding for development and implementation.
- Problems securing adequate grant funding during the initial development phase hamper implementation activities.
- Delays securing the approval of the REDD project methodology have postponed the completion and certification of the project design documents.
- Lack of understanding regarding REDD project design issues have required additional time to create a mutual understanding regarding the process among a diverse group of project partners.

What are your expectations from a future agreement on REDD mechanism?

- Futures agreements should support a REDD mechanism that enables the design and implementation of local projects that benefit forest dependent and indigenous people. Agreements should include mechanisms that provide grant funding for project developers that design people-oriented REDD initiatives. Key elements in such mechanisms should include: performance-based awards to communities for effective mitigation activities, community contracts for project implementation, community-based forest monitoring, and enabling national policy environments that support community REDD projects.

What would be your advice to future project proponents in terms of project design?

- Identify high potential sites with a recent history of rapid deforestation, where there are also communities that are motivated and positioned to control deforestation with project support. Secure at least 3 to 5 years of grant funding to ensure the project can be designed, certified, and implemented up to the first verification period. Link the REDD project to national community forestry policies that can provide forest tenure security to participating community groups.

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Table 2 - Agents, drivers and activites of the Oddar Meanchey Project

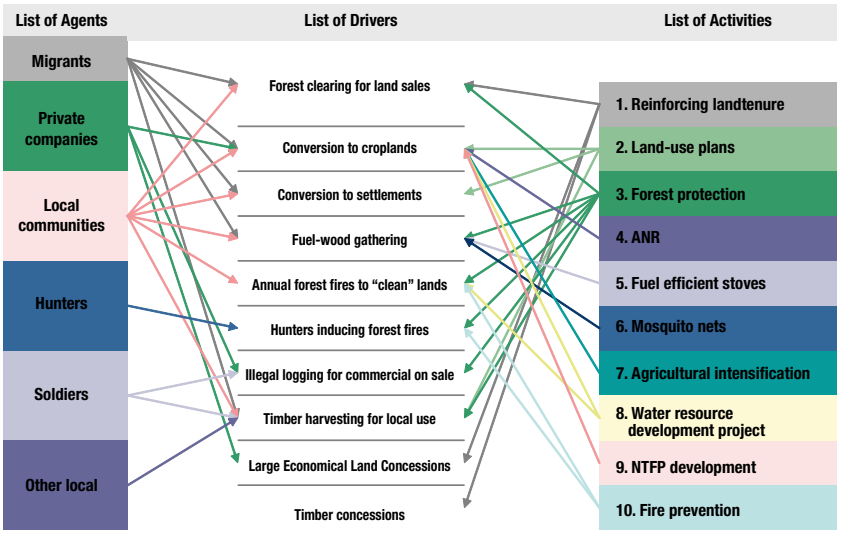

Table 3 – Leakages cancellation rates

Drivers	Leakage		
	Activity shifting inside leakage areas	Activity shifting outside leakage areas	Market leakage
Migrant encroachment	0%	50%	0%
Conversion to cropland	10%	0%	0%
Conversion to settlements	10%	0%	0%
Fuel-wood gathering	10%	0%	0%
Forest fire to «clean» the land	10%	0%	0%
Hunters inducing forest firest	0%	70%	0%
Illegal logging for commercial or sale	0%	0%	70%
Timber harvesting for local use	0%	50%	0%
Large Economic land concessions	0%	50%	0%
Timber concessions	0%	50%	0%

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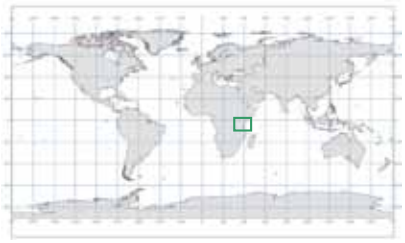
The Kasigau Corridor REDD Project



Project ID	
Location	South East Kenya
Size	30,168.66 ha
Duration	20 years (2006-2026)
Used Carbon Methodology/ Tools	AD Partners REDD Methodology Modules
Validation/ Certification	CCBA (validated Gold) & VCS (planned)
Type of Forest	Tropical Dryland forests
Main Deforestation Driver(s)	Unplanned Slash and burn subsistence agriculture
Main Deforestation Agent(s)	Local (Taita people) and historical migrant communities (Duruma people)
Project Activities	(1) For local communities: alternative incomes (2) For historic migrant/squatter population: exclusion and land tenure clarification including creation of land co-op to avoid new arrivals
Project Benefits	• Prevent the emission of almost 3,000,000 tCO_2e • Add financial sustainability to the existing conservation project • Prevent the loss of spectacular biodiversity • Expand the initiative to the Kasigau Corridor (>200,000 ha) during a phase 2
Project Proponent	Wildlife Works, Inc.
Project Stakeholders	Wildlife Works Carbon LLC, surrounding communities, local minority shareholders of Rukinga Ranching Co Ltd.
Project Funding	Wildlife Works, Inc. own investment

Project's Description

Organizational Issues

The project is implemented in the Rukinga Sanctuary, which is privately owned by Rukinga Ranching Co. Ltd (RRC) under leasehold ownership. The land falls between two national parks and has been puchased in 2000, by majority acquisition of shares in RRC, by Wildlife Works, Inc. The carbon project itself has been launched after finding the necessary financing through a joint venture of Wildlife Works, Inc. and Colin Wiel Enterprises LLC, and called Wildlife Works Carbon LLC. Beyond providing initial fundings, WW Carbon LLC is the implementating body. A Carbon Easement has been executed on the project area. WW, Inc. will be the owner of the carbon credits. Through a legally binding agreement, RRC landowners transferred the carbon and biodiversity rights to WW, Inc.

Project Design

The 30,000 ha project area is the first phase of implementation of the targeted 200,000 ha Kasigau Corridor. Both project area and project zone are mainly covered with dryland forest, threatened by slash and burn agricultural practices that are used for subsistence by immigrants and surrounding local communities. Both those populations began an aggressive conversion in the 1990's that the project aims to avoid through 2 main strategies: secure the land in order to avoid the coming of new migrants and develop alternative economic livelihoods for local communities (through employment in the ecofactory of organic clothes, development of nurseries to growth drought adapted species, school and bursaries program, etc.). While the project started in 1998, the project proponent selected a crediting period of 20 years from 2006 to 2026 under CCB to provide a balance of financial return and permanence of GHG emissions reductions.

Impacts On Climate Change

The baseline scenario is extrapolated from what the deforestation dynamic was before Wildlife Works came on the scene in 1998, based on the analysis of 2 satellite images (1995 and 1999) and on the estimated demographic increase over the crediting period. Those two variables enable to calculate a "per head per year" deforestation surface for the project zone which has been overlaid on Rukinga to determine what percentage of the project area would have been deforested in the baseline scenario, i.e. 835 ha per year, representing an approximate annual rate of 3%. The project aims to completely stop deforestation and to consequently avoid 3.54 million tCO_2e (above and below ground and soil biomass). As a result of their leakage strategy (exclusion of local and migrants communities outside of the project area, development of economic alternatives to the slash and burn agricultural practices, and exclusion of deforestation agents from the leakage belt), the proponent considers unnecessary under CCB to take any deductions on credits due to leakage.

Social & Environmental Impacts

While the Project Area has never been inhabited historically (absence of water), there are estimated to be approximately 35,000 people within the 5kms of the project boundary, essentially coming from two communities. Taita is the local agent of deforestation, mainly constituted of subsistence agriculturalists while Duruma came from the coast of Kenya mostly 10-15 years before the Project start date, and as one of the poorest tribes in the country, is considered as the in-migrant agents of deforestation. The project expects to benefit both local and immigrant agents by providing economic alternatives to the very unproductive slash and burn agriculture and to avoid the coming of new immigrant agents by securing the land. Deforestation alleviation will benefit the very rich in biodiversity and high conservation value area, as it is already obvious since the project start in 1998. Some of the emblematic mammal species are the African Elephant, African wild dog, Cheetah, Lion, Grevy's zebra and many others that have been registered in the rukinga Wildlife Sanctuary.

Financial Issues

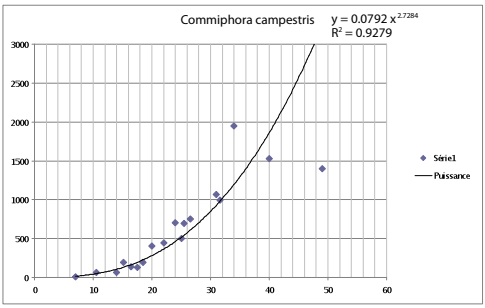
Wildlife Works, Inc. has been funding the conservation project since 1998, on a loss-making basis. While it looked into the possibility of using carbon finance since 1999, this solution only became possible in 2008, when VCS implemented their program for making REDD projects eligible to generate VCUs. Through the Wildlife Works Carbon LLC joint venture, all costs associated with carbon inventory and CCB project design document have already been funded. The carbon revenues are expected to enable the sustainable funding of activities and to extend carbon market benefits to the surrounding locally owned areas. After the CCBA validation process, the project aims to be certified by VCS, as soon as a REDD methodology has been validated.

Issue to highlight…

"Estimate of forest carbon density"

Carbon pools selection

Figure 1 – Regression between AGB/DBH established for *Commiphora campestris* on 16 trees



Project proponents decided to take into account different carbon pools :

1. **Above Ground Biomass for trees and shrubs** (AGB) – Beyond the trees AGB, two different methods have been developed to estimate shrubs AGB, according to a distinction of two shrub types. For multi-stemmed shrubs/little trees that can become very large, a test plot with destructive samplings enabled to establish a standard stem weight by shrub size class (small, medium and big). For each sampling plot, the number of stems and size class of each shrub was registered, and the standard stem weight was applied. For other types of shrub, an average weight was estimated for each size class without destructive sampling. Those average weights were then applied to all shrubs per size class.
2. **Below Ground Biomass for trees** (BGB) – BGB has been estimated using a *TIER 1* methodology and based on the AGB. Using the IPCC 2006 AFOLU Guidelines, the following function has been applied: BGB = 28% x AGB.
3. **Herbaceous Biomass** – 1m x 1m sample plots have been installed in each of the 4 quadrants of tree inventory plots. Following a basic method, all herbaceous samplings were then harvested and bundled, dried and weighed in order to estimate the herbaceous biomass per m².
4. **Standing Dead Wood** – Only standing dead wood has been considered. While there is a lot of lying dead wood in some plots, this pool has been ignored because termites are destroying most of it.
5. **Soil Carbon** – The method to assess soil carbon is based on AD Partners REDD methodological module 6 CP-S (under VCS validation) and Brown 2004 publication. 30 cm deep soil samples have been collected on 28 sites, surrounding the project area. For VCS 100 cm deep samples were taken due to carbonloss evidence deeper than 30 cm.

Ignored carbon pools are lying dead wood and litter which are considered to be insignificant in the project area. Due to the context, ignorance of those pools is a conservative option.

To retain for other projects…

The approach that has been selected for Kasigau project provides a good example of methodological choices that has to be done for all REDD projects. Kasigau choices won't be appropriate in all cases. While some of the carbon pools will have to be considered in any cases, some others are optional. Each project has to decide which carbon pool will be considered and design the biomass assessment protocol for each pool, based on scientific liability, pre-existing data on the area, field implementation cost and feasibility, and carbon benefits that will be generated per pool.

Sampling system

Inside the Kasigau sanctuary, project proponents noticed a high qualitative and quantitative variability in trees and shrubs communities. They decided to previously stratify the project area into 4 different land use types and carried out a systematic sampling system in each stratum

• Agricultural Encroachment Area, • Savannah Grassland • Dryland Forest • Montane Forest.

Plots have been located randomly on a 2 km x 2 km grid, using GPS and only moved when inaccessible to vehicles or for other specified reason (e.g. unsafe to access the plot location due to the presence of wild animals). To improve the safety of access, due to the presence of elephants, plot centres have never been located 200 m farther than the closest road or vehicle track. A total of 115 sampling plots have been placed following a 2 km x 2 km grid and resulting in a 0.04% intensity level. This number of plots hasn't been determined through a statistical calculation, but yielded very good standard errors.

Dryland and montane forests were sampled using 25 m radius circle plots while other strata (savannah grassland and agricultural encroachment area) were sampled using 8 m radius circle plots.

During the biomass inventory, each tree was geographically located in relation to the plot centre. Tree crown diameter was measured, providing the coverage percentage and confirming the project area eligibility to forest definition. All trees bigger than 5 cm diameter were measured (height, diameter, crown and position within the plot)

As dominant tree species go into estervation to preserve moisture during the dry season and lose all of their leaf mass, and the perennial grasses are mostly dormant too, inventory has been carried out during the dry season to insure conservative results.

Establishment of new allometric equations

As there were no available allometric equations for the species types found on Rukinga, project proponents decided to develop specific ones (see Figure 1, the regression AGB/DBH that has been established for *Commiphora campestris* on 16 trees).

They adopted a destructive sampling method and established equations AGB= f(DBH) :

- Per species or per gender for dominant species: *Acacia spp., Boscia coriacea, Boswellia neglecta, Commiphora spp., Lannea spp.*
- Per species group (a global equation) for other species.

A total of 172 trees (i.e. a fair sampling of 8 to 20 trees per specie) was harvested, bundled and weighed in order to establish a regression between DBH and total weight. Regressions have been established via Excel graph function, following the model $y = a * x^b$. ($AGB = a*DBH^b$). In those regressions, AGB corresponding to wet biomass (not dry biomass). Final equations which give AGB_{dry} should therefore include anhydrous density ρ. In Kasigau project, samples haven't been oven dried and no anhydrous density per specie could be found. To estimate dry biomass, project proponents used an approximate 0.5 humidity rate.

Diameter classes from 5 cm to 50 cm have been taken into account (due to the dryness of the area, bigger classes are not very represented in this biome).

AGB has then been estimated applying equations to the whole inventory data, including data on dead standing trees as those ones haven't been differentiated.

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The point of view of…

the project's developer

The Project Proponent

Founded in San Francisco in 1997, Wildlife Works is a business designed from the ground up around a consumer brand that stands for wildlife conservation. Their promise to every customer is that they use the proceeds of their product sales to save endangered and threatened wildlife around the globe. They're achieving this by protecting **wilderness habitats, creating jobs, building schools** and providing other economic benefits for those people who share their land and resources with wildlife. In their first location in Kenya, Africa, they created the 80,000-acre Rukinga Wildlife Sanctuary, where elephants, cheetahs and 45 other large mammal species now roam freely. In order to get sustainable funding for this project, they are now looking into REDD+ carbon valuation.

Upsides / Advantages

- After 13 years this is the best financing mechanism for wilderness protection I have seen in Africa, providing the perfect balance of financial support for forest protection, coupled with benefits for communities and biodiversity.

Downsides / Difficulties

- The REDD mechanisms are incredibly complex, in response to the lack of quality in early AFOLU carbon projects, so it is impractical for communities to do these projects on their own. Quality is a real concern, but the level of rigor is to great in my opinion, and will exclude very good projects that should get the benefit of the doubt.

What are your expectations from a future agreement on REDD mechanism?

- I would like to see the UN follow through and endorse REDD officially, adding it to the framework convention. I believe that would provide enough incentive for the market based solutions to take REDD and run with it. I worry about the Sovereign solutions and REDD readiness funds being proposed, as they talk about inclusion of market based solutions but make no effort to include us in reality, and their promise of vast sums of free money to African governments for REDD are stalling market based approaches.

What would be your advice to future project proponents in terms of biomass inventory?

- Don't rely too much on the published literature, and don't be taken in by the promise of very expensive technologies to perform your inventory. Don't be afraid to get boots on the ground to do your inventory, as it creates immediate jobs in the forest communities and builds skills and values local forest knowledge.

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Juma Sustainable Development Reserve Project, Amazonas, Brazil

Project ID	
Location	Juma Sustainable Development Reserve, Amazonas, Brazil
Size	589,612 ha
Duration	44 years
Used Carbon Methodology/ Tools	"Methodology for Estimating Reductions of Greenhouse Gas Emissions from Frontier Deforestation", submitted to VCS by FAS
Validation/ Certification	CCBS (September 30, 2008), VCS (desired)
Type of Forest	Ombrophyllous Dense Alluvial Forest, Ombrophyllous Dense Forest (Lowland and Submontane), Pioneer Formations of Fluvial Influence
Main Deforestation Driver(s)	• Current drivers: land grabbing for subsistence agriculture and cattle ranching, illegal logging and mining • Future drivers: rural settlements for large scale cattle ranching or agriculture, occupation by land-grabbers
Main Deforestation Agent(s)	Farmers, cattle ranchers, illegal miners and foresters
Project Activities	• Implementation of a Protected Area • Monitoring and Law enforcement • Income generation through sustainable business • Community development, education and scientific research • Direct payments for environmental services (Bolsa Floresta program)
Project Benefits	• Avoided deforestation of 329,483 ha (189,767,027.9 tCO_2 of avoided emissions to 2050) • Community benefits (increased, regular and diversified incomes, employment opportunities, education and health care, support to local social organization, …) • Biodiversity benefits (habitat availability, landscape connectivity, decreased forest fragmentation, …)
Project Promoter	Amazonas Sustainable Foundation (FAS)
Project Stakeholders	Government of the State of Amazonas, Amazonas Sustainable Foundation (FAS), State Secretariat of the Environment and Sustainable Development of Amazonas (SDS/AM), Amarjuma (local dwellers association) and local communities, Institute for Conservation and Sustainable Development of Amazonas (IDESAM), Bradesco Bank, Coca-Cola Brazil…
Project Funding	Government of Amazonas, FAS, Bradesco Bank, Mariott International and its guests (who are purchasing the carbon credits), Coca-Cola Brazil

Project Description

Project Organization

The project implementation site is in the Juma Sustainable Development Reserve, in the State of Amazonas. All lands and rights over environmental services (including carbon) in the Reserve belong to the Government of Amazonas, and were transferred to FAS in order to implement the Juma Reserve REDD project. Private ownership was claimed over some areas inside the Reserve, so these were excluded from the project crediting area. The fact that the project is proposed in partnership with the government of the State of Amazonas carries a guarantee and an obligation to comply with the law. FAS is responsible for project development and implementation, carbon monitoring, marketing carbon offsets, negotiating sales, raising additional finance if necessary, carrying out research and administration and developing new projects.

FAS is a private Brazilian not-for-profit foundation in charge of promoting sustainable development in the Protected Areas of Amazonas. It will be helped in the management of the project (running technical operations, employing local staff and managing relationships with local communities) by the Amazonas State Secretariat for the Environment and Sustainable Development (SDS/AM).

Project Design

Based on forest inventories and remote sensing data, three different types of vegetation were identified and divided into two strata. Total carbon stocks (for all carbon pools except soil organic carbon) were estimated at 156-161 t C/ha for the alluvial forest and dense forest categories.

These ecosystems are under threat from local subsistence farmers, cattle ranchers as well as from illegal logging and mining. Since the project began (2006), activities have been selected to improve local livelihoods (payment for environmental services, training, health care, etc.) and to encourage people to reduce their pressure on ecosystems thanks to the creation of other sources of income.

Impacts On Climate Change

According to the results of a deforestation simulation model (SimAmazonia I), the project area could lose up to 60% of its forest cover by 2050, mainly because of the lack of available lands in other regions and a perceptible upward trend in immigration and land use change pressure, accelerated by road pavement. Carbon stocks in deforested areas were calculated using a Markov Matrix of annual transition probabilities (Fearnside, 1996). Project activities are expected to decrease the simulated deforestation by 90% (the remaining 10% theoretically covering all potential leakage). The monitoring plan includes annual remote sensing surveys and assessments of carbon stocks and governance structure. If the project does not reach the 90% effectiveness goal, payments would be adjusted and management responses have been agreed on.

Social & Environmental Impacts

The project has been designed to improve rural livelihoods while reducing pressure on forests : through forest law enforcement while generating development alternatives and incentives to local communities (responding to local needs of education and health care, identifying community needs for equipment, training, development and market opportunities). The reserve is jointly managed with the communities, who can still have access to the reserve area for traditional resource uses. A portion of the financial resources generated by the project will be paid to communities for environmental services, through the establishment of four components of the "Bolsa Floresta" Program (Family, Social, Associations and Sustainable Income Generation). This translates into direct practical benefits for some of the most marginalized and vulnerable populations, who depend on the forest for their survival. These payments for environmental services concern 25 communities inside the Reserve and 16 communities adjacent to it. They will help to avoid negative impacts (immigration generating leakage of deforestation, disputes with other communities, etc.).

Project Financing

The Government of the State of Amazonas and private investors have funded the initial FAS endowment fund to implement the Bolsa Floresta Program and guarantee its sustainability in 20 protected areas. A contract was signed with Marriott International in 2008 to develop a REDD mechanism in the Juma Reserve, whereby Marriott offers its guests the option to offset its emissions. REDD credits are purchased at a price not less than US$ 1 per tonne of CO_2. The project is expected to generate 3.6 million tons of VERs in the first 10 years and more than 189 million by 2050. The upfront investment by FAS and Marriott will cover at least 57% of its annual implementation costs. Carbon revenues will cover the remainder.

Issue to be highlighted…

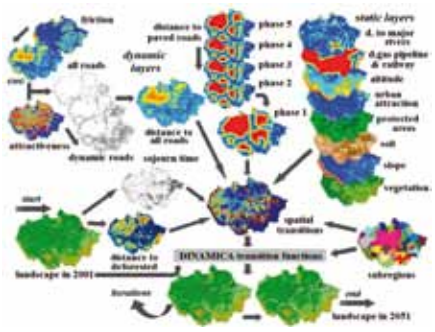
"Baseline scenarios at the project level"

Methodology

In REDD projects, the baseline scenario provides the basis for calculating the emission reductions obtained by the project. It therefore has to give an estimation of emissions without the project, which means that the amount and the location of business as usual deforestation that would have occurred in the project zone have to be known (in order to translate the deforested area into a quantity of CO_2 emissions). This project applied the *Methodology for Estimating Reductions of Greenhouse Gases Emissions from Frontier Deforestation*. Where estimations of future deforestation quantities are concerned, this methodology offers three possibilities: *the historical average approach, the linear extrapolation approach* and *the modelling approach*. For the Juma project, this third approach was used. The baseline scenario was therefore estimated on the basis of a model expressing future deforestation as a function of changes in the explanatory variables of deforestation.

The SimAmazonia model

This project uses SimAmazonia 1, a spatial model built up under the "Amazon scenarios" research program, which is run jointly by the IPAM, the Federal University of Minas Gerais and the WHRC. SimAmazonia 1 covers the entire Amazon Basin at 1km x 1km resolution and generates projections for deforestation up to 2050 based on eight different scenarios (Soarez-Filho *et al.*, 2009).



Sim Amazonia 1 is a dynamic model:

- Annual deforested areas are estimated with the VENSIM application. 47 submodels have been built up to handle 47 subregions defined on the basis of a human pressure index, with migration and transfers of information between subregions also taken into account. The amount of future deforestation depends on the rate of past deforestation (1997-2001), on road building and on protected areas establishment.
- The location of deforestation depends on static factors (topography, rivers, vegetation types, soils, climate, distance from towns and markets, legal status of the land) as well as dynamic factors (distances to roads and to previously deforested regions are recalculated each time the model is run). The Dinamica application is used for spatially explicit simulations.

Validation involves comparing land cover maps obtained through the PRODES system from 2002 to 2007 with the annual projections produced by the model.

Pointers for other projects…

How the baseline scenario is determined is crucial to any project, since it is the difference between emissions observed during the project and the baseline scenario emissions that will determine the amount of carbon credits the project will generate. Two main approaches are generally put forward to build up baseline scenarios: continuation of past trends or projections based on changes in the explanatory variables of deforestation. For obvious reasons of methodological simplicity, most projects to date have built up baseline scenarios based on past trends. The Juma project differs in that it uses a projected scenario based on an existing national economic model. The resulting project experience demonstrates the value of partnerships between project promoters and research institutions for the development of scientifically recognized economic models.

Of the eight scenarios defined in SimAmazonia 1, the Juma project selected the worst-case scenario (business as usual). This predicts that:

- planned roads will actually be built (any new sections of the BR-319 and BR-320 motorways are likely to affect the Juma reserve),
- no further protected areas will be established,
- governance of existing protected areas will not improve (40% of the area of protected areas may be deforested),
- compliance with regulations on minimum areas to be protected in private land will remain low (15% effectively protected),
- recent trends in deforestation will continue unabated (whereas governance scenarios predict a gradual drop in deforestation rates).

Figure 2 : The eight scenarios analyzed by SimAmazonia 1

	Assumptions					
Scenarios	Road paving pressure added to the deforestation trend	ARPA included in protected areas	Degree of protection for protected areas	Minimum % of forest reserve on private land	Rates projected by using yearly derivatives	Rates asymptotically projected by using yearly derivatives
Governance (GOV)	yes	yes	100%	50%	no	yes
Governance without further road paving	no	yes	100%	50%	no	yes
Governance without ARPAS	yes	no	100%	50%	no	yes
BAU with ARPAS, strict enforcement	yes	yes	100%	15%	yes	no
BAU without ARPAS, strict enforcement	yes	no	100%	15%	yes	no
BAU with ARPAS, lax enforcement	yes	yes	60%	15%	yes	no
Historical (no further road paving)	no	no	60%	15%	yes	no
Business-as-usual (BAU)	yes	no	60%	15%	yes	no

The baseline scenario for the project

Up to now, the State of Amazonas has been largely unaffected by deforestation, but the SimAmazonia model suggests that it could lose up to 30% of its forest cover by 2050 if the business as usual scenario proves accurate. This is because the lack of available lands in zones currently subject to deforestation, in conjunction with road building in the State of Amazonas, suggests that those responsible for deforestation in historically logged-over provinces will migrate towards the State of Amazonas in order to establish extensive grazing and soybean crops. This process would be even more marked in the Juma reserve, as the simulations indicate that 62% of the reserve area would be deforested under the BAU scenario, generating more than 210 million tonnes of CO_2 emissions by 2050. The reserve status granted to the project zone should help to protect it from these agroindustrial activities (which are not yet being observed), while local development activities will help to avoid deforestation due to subsistence agriculture and small-scale forestry or mining activities.

Baseline scenario adjustment

Every 10 years (at the end of each crediting period), the difference between the baseline scenarios predicted by the model and the emissions actually observed in the reference zone (which, for this project may be either Brazil as a whole or the State of Amazonas) will be assessed. If the difference is higher than 10%, the baseline scenario will have to be readjusted. To do so, a plan has been set up to monitor the explanatory variables used in the model.

Should Brazil decide to adopt national REDD policies, the next adjustment of the baseline scenario will need to take such policies into consideration to bring it as close as possible to the actual situation.

References, available documentation, websites…

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- Amazonas Sustainable Foundation (FAS) : www.fas-amazonas.org
- Images satellites disponibles à www.dgi.inpe.br/CDSR/w

The point of view of…

the project's developer

The Project Promoter

The Sustainable Amazonas Foundation is a public-private, independent, not-for-profit and non-governmental of public interest institution with no party political connections. It was founded in 2007 by the Amazonas State Government and the Bradesco Bank, in accordance with their statutes, approved by the State Public Ministry and registered in accordance with federal and state laws in the Civil Registry.

Upsides / Advantages

- Certification using strong international standards
- Certified co-benefits for the climate, communities and biodiversity in the project area
- Strong local involvement component
- State legal basis to develop REDD projects
- Transparency and governance

Downsides / Difficulties

- Logistics (high operational costs due to long distances and access difficulties)
- Reconciling different interests among local stakeholders
- Applying international concepts and acceptable solutions

What do you expect from the international negotiations on REDD issues?

- The creation of legal instruments for REDD under the UNFCCC should ensure that environmental integrity is maintained in global mitigation efforts, guarantee the rigor of the appropriate methodologies and should avoid any decrease in the domestic emission reduction efforts of developed nations.
- The REDD approach in international negotiations should involve simple and flexible mechanisms and procedures, avoiding the complexity and the costs observed in projects implemented under the Kyoto Protocol.
- It should also maintain the environmental integrity established by the UNFCCC and ensure effectiveness backed up by sufficient and predictable financing.
- The REDD approach should guarantee improved standards of living for forest communities, as well as transparent and equitable distribution and use of the funds generated.

What is your advice to future project promoters on the subject of scenario design?

- With regard to the baseline scenario, it is very important to recheck and specify the parameters.

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Sao Francisco Forest Project REDD in the State of Tocantins

(former Genesis Forest Project)

Project ID	
Location	State of Tocantins, Brazil
Size	1,140 ha
Duration	20 years (up to 2029)
Used Carbon Methodology/ Tools	BioCarbon Fund Methodology for Estimating Reductions of GHG Emissions from Mosaic Deforestation – version 1, 2008
Validation/ Certification	CCBA Standards, Social Carbon
Type of Forest	Riparian and dry forests, Savannah, Cerrado ecosystem
Main Deforestation Driver(s)	• Forest fire, used as a crop and pasture management tool. • Expansion of urban areas and linked demographic increase.
Main Deforestation Agent(s)	Local families living on the surrounding areas
Project Activities	• Creation of a Protected Area on Private Land (RPPN) - 1,140 ha • Control and Fighting Forest Fire; • Capacity building dedicated to non-timber forest management; • Biodiversity Research and Conservation; • Environmental Education
Project Benefits	• 132 ha of avoided deforestation (28,700 tCO_2e to be avoided) • Dissemination of new practices • Capacity building and knowledge sharing on Cerrado conservation and use of its natural resources • Support training of the local fire brigade
Project Proponent	Instituto Ecológica - IE
Project Stakeholders	IE, CantorCO_2 Brazil, Carbonfund.org, Hyundai, Ecologica Assessoria (landowner), local families
Project Funding	Up-front payment, after validation to the CCBS for voluntary offsets (Hyundai Motors America)

Project's Description

Organizational Issues

The REDD project is developed in four different private lands, property of Ecológica Assessoria and situated in the Lajeado National Park buffer zone. Instituto Ecológica is the project proponent and the implementation body for the project. To complete its experience in terms of carbon community-oriented projects, partnerships have been established with CantorCO_2 Brazil (partly constituted of Ecológica Assessoria) for methodological issues and carbonfund.org for commercial ones. All credits are contractually sold to carbonfund.org who signed a contract with Hyundai.

Project Design

The project area is a 1,140 ha combination of 6 vegetal physiognomy categories, clustered into 3 main groups in terms of emission factor from fire events (cerradao, cerrado stricto-sensu and cerrado field). In the 80's, the State of Tocantins's creation and the development of its capital (32 km far from the project area) resulted in a disorganized use and occupation of the landscape, and highly increased the demographic pressure on the area. The main deforestation and degradation driver is the use of forest fire to renew grassland for cattle and subsistence agriculture. The project aims to implement the Protected Area on Private Land mechanism (RPPN) in 57,4% of the project area and to develop activities to directly tackle the drivers. Through the Social Carbon Methodology, activities are identified to benefit all stakeholders; e.g. specific capacity building on non-timber forest products and fire control…

Impacts On Climate Change

Deforestation is defined as land conversion with total loss of woody above-ground biomass, while degradation is understood as a result of fire events over the natural vegetation. Degradation baseline for the next 20 years has been calculated based on the last 10 years historical series of forest fires. Values were modelled to calculate the equivalent for each physiognomy that will probably be hit by fire. Deforestation projections are outlined considering the average deforestation rate, applied to land apt for agriculture physiognomies that occupy plane terrain. To keep conservative and as land conversion does not appear to be the short term willingness of the landowner, deforestation won't be included in the baseline calculation before 2014. Monitoring will be done every 5 years in the project and leakage areas.

Social & Environmental Impacts

While only one family is leaving within the project area, the use of fire as a cropland or pasture management tool by surrounding communities directly result in degradation of the project area. Those communities have subsistence lifestyles, are direct users of natural resources, and would consequently be impacted by project activities. Through the SOCIALCARBON® Standard (interviews and participative meetings), directly and indirectly impacted stakeholders have been identified and inserted in the decision making process. All stakeholders groups (fire brigade members, artisans, honey producers, local inhabitants, etc.) are targeted by specific activities. This tool was also used to monitor activities' efficiency along the project lifetime. A centre for Biodiversity and Climate Change (Centro Ecotropical) is currently being developed to insure the long term research and capacity building and reinforce the implementation of activities.

Financial Issues

The project development has been funded by Hyundai through an up-front payment for voluntary offsets. All credits have been sold to Carbonfund.org which will be responsible for delivering the credits to Hyundai. Main project resources are coming from VERs' sale and private donations devoted to the Research centre. Those incomes are expected to be sufficient to finance the implementation and maintenance of the conservation activities until the Ecotropical Centre will be able to sustain it, without external resources, in the entire Project area. EI previously tested the financial feasibility of the project using the REDD Financial Feasibility Assessment Tool developed by Social Carbon and CCBA.

Issue to highlight…

"Evaluate and quantify REDD project's social benefits"

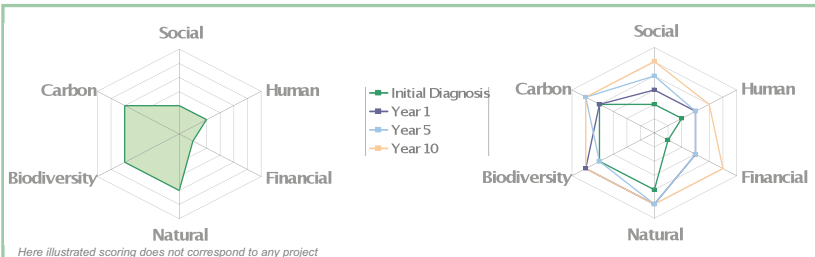
Social carbon Methodology – General description

Instituto Ecológica (IE) plans to use the latest version of the SOCIALCARBON® Standard (Version 03, May 2009) to monitor and assess the social and environmental benefits of the Genesis Forest Project.

Through participatory meetings, interviews and questionnaires, and following the SOCIALCARBON® Standard, IE will list initial indicators for each of the 6 resources that have been identified by the SOCIALCARBON® Standard.

Resources	Description	Type of Indicators
Social resources	Working networks, social duties, social relations, affiliations and associations	Associations, Conflicts, Interferences, Collectivity, Family relations
Human resources	Skills, knowledge, capacities for work and good health	Education of youths and adults, Health, Technical assistance, Incentive work, Professional capacity, Leisure
Financial resources	Basic available or potential capital	Credits, Rural trade, Employment, Extractive revenues, Rural revenues, Infrastructure, Residence, Equipment
Natural resources	Stock of natural resources (land, water, air genetic resources) and environmental services	Native ecosystem, Protection, Anthropogenic impacts, Water resources
Biodiversity resources	Conservation value, vulnerability and use	Natural communities, Use, Species
Carbon Resources	Carbon management	Transaction cost, Type of project, Community involvement, Social return

Each indicator receives scores ranging from the worst scenario (e.g. absence of formal community association) to the ideal situation (e.g. organization with internalization of community spirit). Data are collected through interviews and/or participative meetings, and a score is given per indicator. The average scores are plotted on hexagons which are used as visual indicators to assess the project's performance over the time.



Here illustrated scoring does not correspond to any project

Assess and monitor social and environmental benefits of the project

The SOCIALCARBON® Standard will be used by IE to assess the effectiveness of REDD activities in a qualitative way.

An initial diagnosis will be conducted at the beginning of the implementation phase to provide a description of the reference context. Over the project lifetime, information will periodically be collected to assess of each indicators evolution. Those monitoring sessions are planned to be conducted every 5 years. Interviews, questionnaires, local surveys and participative meetings will be conducted to collect the peoples' point of views on the project effectiveness. This will complete the satellite and technical data and provide sources for the evaluation.

The hexagon graphic will provide an illustrating map of the project performance, and allows stakeholders to see which resource require an improvement. It is produced every monitoring session and provides a visual indicator of the performance evolution over the project lifetime.

The SCM focuses on co-benefits (social, environmental, human, etc.). While carbon is identified as one resource, SCM does not provide any procedure for the CO_2 emission reductions. Therefore, the project proponent will conduct periodic (every 5 years) quantitative analysis to monitor the land use changes and the number of fire outbreaks inside and outside the project area. The SOCIALCARBON® Standard is used as an additional monitoring tool that provides a qualitative evaluation of the project.

Project design process

The SCM can also be used on the design process to identify project stakeholders and design the way activities that involved local people will be implemented.

Besides informal consultations with landowners and local institutions, and official and scientific data, the project proponent is currently involved in other projects with Taquaraçu community and has a very good knowledge of the socio-economical context. Based on this knowledge and to achieve the targeted emission reductions, it has developed a Plan of Work for Conservation. While this Plan of Work schedules the activities, the SCM process will allow identifying the potential contribution of each stakeholders group to the day-to-day implementation of those activities. As an additional scheme to the Plan of Work for Conservation, the SCM will be used to insert communities in the decision making process through participative approach.

Considering the fact that projects can take years to be fully developed, to be validated and to show the first results, IE decided to start the initial diagnosis in the beginning of the activities' implementation and not during the PDD writing; i.e. early enough to be integrated in the project design process but not too early to avoid premature expectations from the communities.

In the framework of the CCBA certification, interviews and meetings have to be done and the project's impacts on communities will have to be monitored. Hence, the SOCIALCARBON® Standard does not add too much in the initial price, except the transaction costs (validation and certification) of the Social Carbon reports which vary from US$ 2,000 to US$ 4,200.

Social Carbon and CCBA

Because it does not provide any guidelines for the carbon accountability or monitoring, the SOCIALCARBON® Standard has to be combined to another carbon methodology and/or standard. Moreover and through a devoted registry, Social Carbon standard will certify offsets (e.g. VERs) but won't generate it.

To deal with carbon technical issues and emission reductions monitoring, the Genesis Forest Project use the BioCarbon Fund Methodology dedicated to mosaic deforestation (version 1, 2008) and currently under VCS registration. Following the buyer demand, a PDD has also been submitted to the CCBA standards and is currently undergoing validation. For the project developer, CCBA and SCM provide different key benefits and can be seen complementary. While the CCBA Standards requires a continual process to monitor social aspects and to involve stakeholders, the SCM provides guidelines to do it. This double certification main problem is the addition of transaction costs for the CCBA Standards, for the Social Carbon and for the VCS in case the objective is to generate carbon offset certificates.

The point of view of…

the project's developer

The Project Proponent	
	Founded in 2000, IE is a Civil Society of Public Interest Organization that has the mission to reduce climate change impacts, through scientific research, conservation, environmental preservation, and support to communities. IE elaborated and executed the first Brazilian carbon sequestration project, guaranteeing the communities' involvement in the initiative. This work resulted in the creation of the Social Carbon Methodology.

Upsides / Advantages	Downsides / Difficulties
• EI experience on the field; • Synergy with other development and research projects, such as Ecotropical for example; • Large experience with communities programs and participatory approach.	• Lack of approved methodology; • Delays on the Validation process; • When you are working with small areas, there is no good resolution and the error scale may increase.

What are your expectations from a future agreements on the REDD mechanism?

- Very low at this moment, there is still a lot of unclear definition from the Brazilian Government position regarding REDD issues. We have a more optimistic expectation to REDD on the voluntary market.

What would be your advice in terms of co-benefits assessment and monitoring?

- SOCIALCARBON® Standard plays a very important and efficient role on the monitoring of sustainable development in medium and long term. Another important advice is that the community approach should be participatory and flexible, local policies and local people expectations could change.

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References, available documentation, websites…

Instituto Ecologica, Social Carbon, Hyundai, CantorCO2e Brazil and Carbonfund.org (2009) Genesis Forest Project: reducing Greenhouse Gas Emissions from Deforestation and Degradation in the State of Tocantins, Brazil – Version 2 (17/06/2009).

- A 1st version is publicly available with appendixes and calculation tables on the CCBA website http://www.climate-standards.org/projects/files/tocantins/ccba_pdd_tocantins_redd_v_1.pdf

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- Instituto Ecologico website: http://www.ecologica.org.br/ingles/index.html
- Social Carbon Standard website: http://www.socialcarbon.org/
- Social Carbon Consulting group: http://www.sociacarbon.com
- Carbonfund.org website: http://www.carbonfund.org/
- CantorCO2e Brazil website: http://www.cantorco2e.com/
- Hyundai Genesis Forest Project website: http://hyundai.carbonfund.org/


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Reducing Carbon Emissions by Protecting a Native Forest in Tasmania

Woodside Park © REDD Forests

reddforests

Project ID	
Location	North Tasmania – Australia
Size	1,433.9 ha (790 ha of forests designated for conservation)
Duration	25 years (up to 2035)
Used Carbon Methodology/ Tools	Specific carbon assessment methodology developed for the project and FullCAM software for the baseline establishment
Validation/ Certification	CCBA standards
Type of Forest	Temperate Eucalyptus rainforests
Main Deforestation Driver(s)	Thinning, small-group clear fell and high grading, conversion to plantation
Main Deforestation Agent(s)	Landowners via logging companies
Project Activities	• Development of a protected forest following the HCVF Toolkit • Substitution of income from logging to carbon revenue
Project Benefits	• Avoidance of 140,000 tCO_2e during the contract term • HCVF Conservation • Extension of the conservation scenario to surrounding private owned lands (thanks to carbon revenues)
Project Proponent	REDD Forests Pty Ltd
Project Stakeholders	REDD Forests subcontractors, landowners
Project Funding	REDD Forests Own Investment

Project's Description

Organizational Issues

The project has been developed in two private owned lands. Through a 25 years exploitation contract, landowners transferred the property right on carbon to REDD Forests. The financial agreement is calculated based on carbon potential of the land. Landowners commit not to log for 25 years and get paid from the carbon benefits. Management of the project is done by REDD Forests who is acting as project proponent and who subcontracts other entities for specific or technical issues.

Project Design

Project area boundaries have been delineated following the private properties limits. Forest stratification within the project area has been made based on differentiated histories of logging on the parcels. For the 790 ha of harvestable lands, the project scenario consists in protecting forest by implementing the High Conservation Value Forest toolkit, including the fire and pest risks management. Landowners commit to cease logging for 25 years and get paid for ex-ante sold credits. Depending on the baseline scenario, accreted or sequestered carbon credits may be periodically generated which would provide a further income for the landowner. Carbon revenues are expected to exceed incomes that would be earned under logging scenario. This positive money substitution is the driving force of the project design and additionality.

Impacts On Climate Change

Baseline scenario has been established based on what would be the most likely land-use scenario in the absence of the project and following IPCC 2006 GL for AFOLU. Based on landowners' assertions and socio-economical condition of small farms and ranches in the project zone, the baseline scenario is the conversion of all harvestable areas (790 ha) to Eucalyptus nitens plantations. The total amount of carbon that would be emitted under the baseline scenario is estimated as the carbon in above and below ground biomass plus the carbon in wood debris, using Australia's FullCAM software (version 3.13.8) to compare carbon stocks between the with and without scenarios over the project lifetime. As carbon revenues are expected to be more important than logging income, there won't be any loss of earnings and consequently no risk of leakage by displacement of pressure.

Social & Environmental Impacts

No local communities or forest dependant peoples are living within the project area. Social and environmental impacts of the project are directly linked through the environmental services notion. Because of its biodiversity, cultural and scenic values, the forest area is considered as a High Conservation Value Forest, following the IUCN criteria. Social and environmental impacts of the project are directly linked to the conservation of those values thanks to the implementation of the HCVF Conservation Toolkit. As the project is a demonstration activity, its socio-economical impacts will be enhanced while the project effectiveness will be proven and adopted by other landowners.

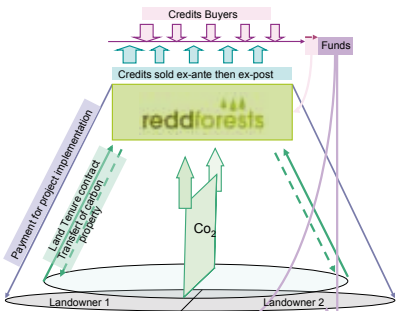
Financial Issues

Project costs will mainly include certification process, monitoring costs, forest management (fire and pest prevention) and land tenure (i.e. contracts with landowners). All those costs are and will be up to REDD Forests' charge. Percentage of the carbon revenues is transferred to landowners with the land assignment contract held in a specially created trust. The whole project depends on the fact that carbon value of the forest is more important than its logging value and on the substitution of logging incomes with carbon revenues.

Lessons to be learnt…

"Using Carbon Finance as an alternative income to logging revenues"

General Description



1. Lands' carbon potential assessment
2. Contract between REDD Forests and Landowners transferring carbon property right to REDD Forests
3. Project implementation costs covered by REDD Forests (PDD & studies, MRV & certification)
4. Carbon credits sale, by REDD Forests to buyers
5. Transfer of contract to a trust fund
6. Percentage of income is paid to landowners.

The project builds on the fact that - thanks to a prior carbon assessment - REDD Forests convinced landowners that it would be more profitable to evolve towards conservation practices. Based on that, they could offer a contract that initially generates more revenues for landowners than a logging contract would.

What is true for all REDD projects, is of course true for this one: drivers have to be tackled efficiently to insure REDD project success. In this project case, drivers are exploitation for logging and conversion to commercial plantations which under the BAU scenario, would be enabled through contracts agreed between landowners and logging companies. In those contracts, landowners – to whom it is the decision to continue or to stop logging – are not in essential need of forest resources but of revenues generated through resources sale. What is therefore specific to this situation, and not necessarily reproducible in all circumstances, is precisely that financial substitution can be expected to enable landowners to stop logging, thanks to the following initial conditions:

1. Land tenure context is clear and simple;
2. Driver motivation is financial, and financial substitution is therefore of the same nature and interest of what landowners would get under BAU scenario;
3. REDD Forests was able to provide the initial investment required for the carbon process and project implementation.

Land tenure context and carbon contracts

Two different landowners are involved in the project. The first one, registered as a private company, owns 2 parcels (741.9 ha). The second one, a tenancy as owners in Common-Equal share, owns 6 parcels (692 ha). Both owners get the right to harvest and clear cut their parcels. Lacking any indication on carbon property right in Australia, carbon is here considered as a personal incorporeal property, fully transferable. Given that all required investments for the project were provided by REDD forests, emissions reductions achieved with the project activities implementation will be owned by REDD Forests.

The full transfer to REDD Forests of logging rights and concomitant carbon rights are regulated through 25 years legally binding contracts that also set out obligations and responsibilities between contractors.

REDD Forests is accountable for carbon offsets sale and permanence. It acts as a commission agent and takes a small percentage of the revenues generated by carbon credits while landowners get the lions share on it.

Fully stop the logging exploitation without any risk of displacement

Under the transfer contract, landowners commit to cease any logging activities and not to get any contract with logging companies during the project lifetime (25 years). This commitment can reasonably be envisioned only because logging activities are motivated by commercial and financial purposes and not by direct subsistence need. The simple act of substituting carbon revenues to logging ones, will be efficient, provided those revenues are equally if not more important than logging ones.

Comparing the two activities, the project proponent explained that carbon valuation can generate around 3.5 times more benefits than a logging contract. When you have 100 tons of wood per hectare, the logging companies will only pay for the useable part, i.e. for 60 tons. Under the carbon valuation scenario, you first have 2 times more tons of carbon than you have tons of wood and you will get paid for the all tons of CO_2. Of course, this relation highly depends on the commercial value of a ton of CO_2, giving the importance of a commercial analysis to market carbon credit.

If landowners get more financial benefits from carbon valuation, we can reasonably think that they will effectively stop those activities and that they won't displace the pressure on other ecosystems. The other main leakage risk is called the "market leakage". If wood demand is not satisfied, logging companies could log for supply other ecologically more valuable ecosystems and act as pressures "displacer".

In this project case, the limited size of the zone targeted for conservation, which represents an insignificant part of the timber market, secure the project against market leakage. However, it will have to be fully considered in case of extension.

Steps to come

The REDD Forests project in Tasmania is a pilot project designed to prove the commercial viability of using carbon market to generate alternative incomes to traditional logging ones. Project has been certified by the CCBA standards and implementation started in February 2009. Logging has been ceased on the property, biodiversity and carbon sample plots have been set up, and monitoring already started. All those activities are paid thanks to REDD Forests funding who fully assume this anticipation and linked risks.

The success of the demonstration is now depending on the sale of carbon offsets. In order to have a better view of what the REDD mechanism will be in future national and international agreements on climate change, REDD Forests decided to wait for Copenhagen. The approach that will be adopted in terms of credits' commercialisation will depend on the integration of REDD offsets under the UNFCCC and under the Australian Scheme Carbon Pollution Reduction Scheme. If the REDD scheme only remains a voluntary one, the CCBA certification will be completed by a VCS one. If REDD scheme integrates the compliant market, the project will be submitted for registration under the Australian Carbon Pollution Reduction Scheme. If successful, this project will result in an exponential extension to larger areas and many more landowners in Tasmania.

The point of view of…

the project's developer

The Project Proponent	
reddforests	Redd Forests Pty Ltd was incorporated in December of 2008 as a "profit for purpose" business designed to apply commercially viable methodologies to replace activities that degrade or destroy the world's forests.

Upsides / Advantages	Downsides / Difficulties
• Avoided emission of 140,000 tCO_2e during the contract; • Preservation of high conservation value bio region; • 25 years protection and recovery window for threatened species; • Changing perspective of landowners away from logging and towards conservation; • Enhanced community appreciation of and involvement in the native landscape.	• Negative attitudes towards REDD by some sectors; • Insistence on permanence (100 years plus) which is both impractical and unnecessary as the immediate need is to tackle the effects of climate change now; • Lack of understanding by the financial sector on investment and financial benefits of a project of this type.

In what way Copenhagen 15th COP decisions could impact your project?

- Ideally Article 3.4 to become mandatory rather than voluntary.
- Recognition that REDD must play an essential part in tackling the effects of climate change now.
- Inclusion of the project into the CPRS as a result of point 1.
- Access to investor funds as a result of point 2.

What would be your advice to future project proponents in terms of financial substitution?

- Ensure that investors have a philosophical and ethical interest in the objectives of the project.

Contact person

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References, available documentation, websites…

- REDD Forests (2009), Reducing Carbon Emissions by protecting a Native Forest in Tasmania, PDD for CCBA validation (prepared by MGM International). http://www.climate-standards.org/projects/files/tasmania/REDD_Forests_CCB_PDD_FINAL_071609.pdf
- SCS (July 2009), Final CCBA Project Validation Report. http://www.climate-standards.org/projects/files/tasmania/ CCB_REDDForests_RPT_ValidationReport_071709.pdf
- REDD Forests website: http://www.reddforests.com/

Acronyms

A/R	Afforestation and Reforestation
AAR	Average Annual Return
ACR	American Carbon Registry
ADP	Avoided Deforestation Partners
AFD	French Development Agency
AFOLU	Agriculture, Forestry and Other Land Uses (previously LULUCF : Land Use, Land Use Change and Forestry)
APA	American Power Act
AWG-LCA	Ad-hoc Working Group on Long-term Cooperative Action
BioCF	BioCarbon Fund
BR&D	BioClimate Research and Development
CAPEX	Capital Expenditure
CBD	Convention on Biological Diversity
CCAR	California Climate Action Registry
CCBA	Climate, Community and Biodiversity alliance
CCBs	Climate, Community and Biodiversity standards
CCX	Chicago Climate Exchange
CDI	Carbon Decisions International
CDM	Clean Development Mechanism
CI	Conservation International
CITES	Convention on International Trade in Endangered Species
CLIP	Collaboration and Conflict, Legitimacy, Interests, Power

COP	Conference of the Parties
DFID	Department For International Development (UK)
DRC	Democratic Republic of the Congo
EAW	Equivalent Annual Worth
ECCM	Edinburgh Centre for Carbon Management
ERPA	Emission Reduction Purchase Agreement
EU	European Union
EU – ETS	European Emissions Trading Scheme
FAO	Food and Agriculture Organization
FAS	Fundaçao Amazonas Sustentavel
FCPF	Forest Carbon Partnership Facility
FFEM	French Global Environment Facility
GHG	Greenhouse Gas
GOFC-GOLD	Global Observation of Forest and Land Cover Dynamics
GPG LULUCF	Good Practice Guidance for Land Use, Land-Use Change and Forestry
IDESAM	Institute for Conservation and Sustainable Development of Amazonas
IFLs	Intact Forest Landscapes
IFM	Improved Forest Management
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
IUCN	International Union for Conservation of Nature
ICER	Long-Term Certified Emission Reduction
LULUCF	Land Use, Land Use Change and Forestry
MEA	Millennium Ecosystem Assessment
MRV	Monitoring, Reporting and Verification
NFPC	Non For Profit Organisations

NGO	Non governmental organisation
NPV	Net Present Value
NTFP	Non Timber Forest Products
ONFI	Office National des Forêts - International
OPEX	Operational Expenditure
PDD	Project design document
PES	Payment for Environmental Services
PIN	Project Idea Note
REDD	Reducing Emissions from Deforestation and Degradation
SCM	Social Carbon Methodology
SCR	Social Carbon Report
SCS	Scientific Certification Systems
tCER	Temporary Certified Emission Reduction
teqCO_2	Tonne equivalent CO_2
TGC	Terra Global Capital
TNC	The Nature Conservancy
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit
VER	Voluntary / Verified Emission Reduction
WCS	World Conservation Society

ONF International (ONFI)

is an international, environmental

consulting and expertise bureau

specialized in sustainable ecosystem

management (notably forest related)

and the fight against the

greenhouse effect.

Involved in more than fifty countries

in Latin America, Africa and Asia,

ONFI is well-known for its experience

in sustainable forest management,

and is a leader in climate change

processes (REDD and CDM issues).

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REDD+ at project scale

Evaluation and development guide

For more informations:
http://onfinternational.org/

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