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Forest carbon : tackling externalities

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While the forestry sector joined the stage on international negotiations with the REDD+ mechanism and has been successful in the voluntary carbon market since 2008, serious discussions emerged regarding the potential "non-climatic" impacts of forest carbon. Indeed, reducing carbon emissions in the forestry sector or growing additional carbon stock can have significant impacts - either positive or negative – on local communities and on the environment. Considering such externalities is a prerequisite for the expansion of forest carbon.

This paper first identifies the main externalities surrounding forest carbon projects and analyses their link (complementary or substitutable) with climate benefits. As the demand for forest carbon mainly arises from the voluntary market, we then give an overview of the current level of consideration for externalities in this market, based on the answers collected from two different surveys. Considering that the voluntary market might give way to a compliance one, we then discuss the consequences of a broader integration of forest carbon into compliance markets, with a focus on the cases of New-Zealand and California.

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Introduction

With around 3000 billion tonnes of CO_2 equivalent stored in the Earth's forests and between 5 to 10 billion tonnes released every year through tropical deforestation and degradation, the forestry sector could play a significant role in the fight again climate change. However, forest carbon - here defined as carbon credits sourced from forestry projects that reduce and/or sequester greenhouse gases (GHG), has long remained on the fringe of global carbon market (Kossoy and Guigon, 2012). The main project types are avoided deforestation and degradation (REDD), Improved Forest Management (IFM) and Afforestation/Reforestation (A/R). The many technical hurdles (permanence, leakage, measurement, etc.) faced by negotiators during the conference of Kyoto led to a restricted inclusion of the forestry sector in the Kyoto Protocol. Complex and restrictive rules were adopted for the accounting of the forestry sector in the Emission Trading System applied to Annex 1 countries. Emissions from tropical forests were nearly ignored, the eligibility to Clean Development Mechanism (CDM) being limited to A/R projects which could only deliver temporary credits. A step forward was made during the 13th Conference of Parties (COP 13, Bali, 2007) with the adoption of a road-map for implementing Reduced Emissions from Deforestation and Degradation (REDD). During COP 15 (2009), REDD was expanded to REDD+ to include further activities, namely forest conservation, sustainable forest management, and carbon stocks enhancement.

The goal of carbon markets is to drive GHG emissions down in the most cost-effective way. In principle, forest carbon makes no exception to this target. However, since they are land-based activities, forest carbon activities often interfere with other ways of land uses and generate trade-offs on agricultural output, terrestrial biodiversity and rural communities' livelihoods. Forest carbon with climate benefits may lead either to environmental and human welfare losses or, if well designed and implemented, generate co-benefits.

Forest carbon is currently not eligible in the main compliance carbon trading regimes, notably the European Union Emission Trading System (EU ETS) which represents the major source of demand for carbon credits. Demand for forestry credits thus mainly arises from the voluntary market. This market already shows some evidences of specific interest for high quality credits, where the social and environmental impacts of forestry projects – then referred as "externalities", are addressed. This paper first details the concept of forest carbon externalities and outlines an analysis of the complementarity or substitutability of these externalities with the carbon benefits. In a second step, we present an analysis of the way the voluntary market addresses the issue of externalities. Then, as the voluntary market may serve the early development of compliance markets, we investigate the consequences for carbon externalities of a transition towards compliance markets.

1. Tracking externalities in forest carbon

1.1. Clarifying the concept of externality

In this paper, the term “externality” designates all the “non carbon” impacts – both positive and negative - of forest carbon projects.

Although the main aim of forest carbon projects is not always the carbon emissions reduction but the social and/or environmental components, in this paper, we choose to assume carbon issue as the core objective of forest carbon and thus call “externalities” all the impacts of the projects other than emissions reduction.

Table 1 below presents a classification of forest carbon externalities based on the answers of a survey led by the Climate Economics Chair (see section 2 and Annex 1 for details on the survey). The participants were asked to list the main impacts that might happen when developing a forestry project aiming at reducing or sequestering carbon emissions. We suggested the four subcategories presented in Table 1. Among them, the category “environmental impacts” mainly gathers non-market goods, whereas the impacts on “Population welfare” and “local agriculture” often consist in market goods. This distinction might impact the way these externalities will be addressed by forest carbon market players.

The main externalities identified by the participants are clearly the potential impacts on biodiversity and on the livelihood of forest dependent local communities.

Due to the diversity of forestry projects, a classification of externalities by project type (REDD, A/R, IFM) was not feasible. However, we observed a consensus on the potentially strong negative side-effects on the environment of monoculture plantations, although such projects may achieve high levels of carbon sequestration. Florian Reimer (project developer at South Pole) explained that they “do not prefer developing "Green Desert credits" from monoculture plantations”, putting into a phrase an example of hesitant prospects for this kind of projects.

Table 1 - Classification of the externalities perceived by interviewed people

Impact of the project on…	Answers of the people interviewed	Number of quotations*
Environment and ecosystems	**Biodiversity:** *Positive impacts*: Creation of habitat - Restoration of ecosystems - Control of weeds - Control of pests *Negative impact*: plantations of monoculture endanger biodiversity	**11**
	Micro-climatic regulation	**1**
	Water quality improvement	**2**
	Wildfire better controlled	**3**
Population welfare	**Livelihood of forest dependent communities** strengthening: Job creation in forest management and related industries - New source of income / Diversification of revenue	**9**
	Knowledge improvement: Several projects with training programs organized - Education for children and women - Recreational and educational opportunities	**2**
	Right of indigenous people and local communities	**2**
Local agriculture	Soil quality: Less erosion - Soil conservation - Water infiltration - Soil nutrient maintainance - nitrogen cycle	**4**
	Agricultural alternatives (agroforestry, pastoral farming…)	**2**
	Agricultural Intensification: *Positive impact*: more production in a same area → more income and increase in food security; *Negative impact*: potential damage on the environment if intensive agriculture	**3**
Other - mainly institutional	Governance: Project implementation can influence the environmental policy. Ex: reforestation project developed by the ONFI in Mato Grosso was used for the design of the national REDD policy.	**1**
	Right of soil : *Positive impact*: The necessity to distribute carbon credits force to define land rights or at least to start a reflection on land rights (particularly necessary in Africa); *Negative impact*: Displacement of population - Purchase of land by foreigner	**2**
	Political interferences between developed and developing countries	**1**

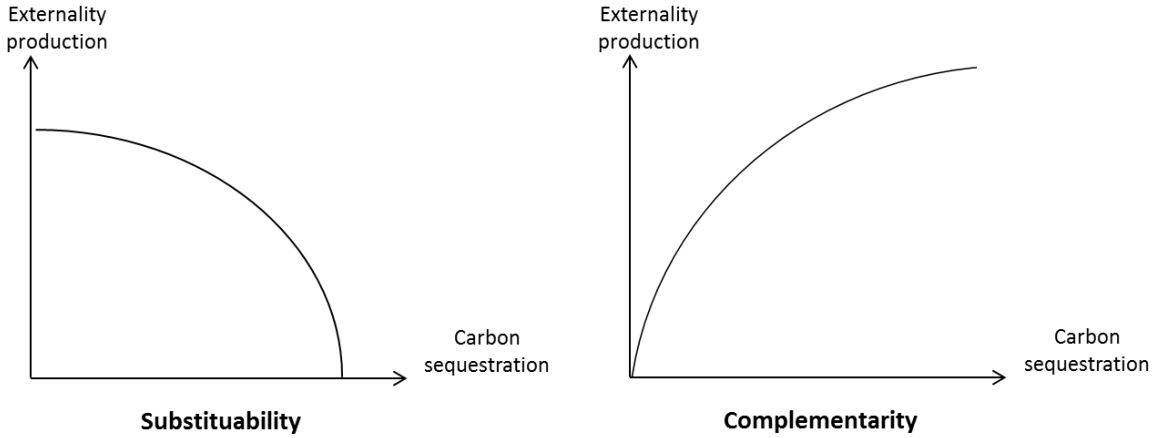
Source: Climate Economics Chair

*Survey conducted with 18 players on the forest carbon market

1.2. Exploring the relationship between carbon sequestration and externalities

Depending on the nature of each forestry project and the way it is implemented, the production of positive externalities can be either complementary or substitutable with carbon sequestration / emissions reduction. As illustrated in Figure 1, there is complementarity when different benefits are jointly generated by the project. In contrast, when favoring one benefit leads to mitigating the others, we are in a case of substitutability.

Figure 1: Theoretical illustration of the relation between carbon sequestration and externalities



Source: Climate Economics Chair

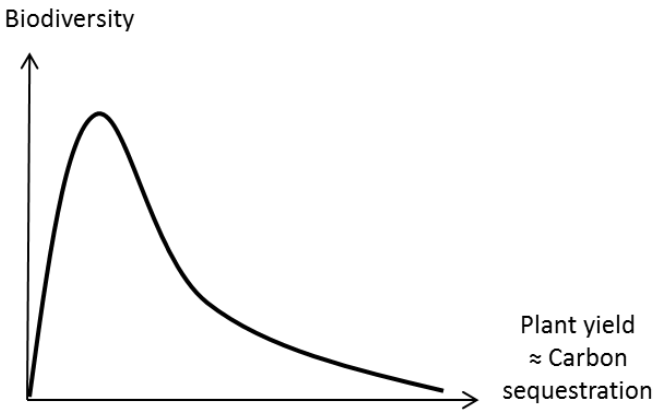
These concepts can be illustrated with the example of biodiversity. If the production of a positive externality is complementary with carbon sequestration, then it represents a “win-win” situation. It is the case for example of an ecosystem restoration project where carbon intensification actually leads to natural capital reconstruction and regenerates the previously lost ecosystemic services.

In contrast, a project that turns a low-carbon natural ecosystem into a carbon-intensive one, like an intensive eucalyptus plantation, is a good example of substitutability. Indeed, the carbon outcome is achieved at the expense of a natural ecosystem, leading to a decrease in the level of biodiversity. In this situation, there is a trade-off between emission reductions and the other effects of the project. The decision on how many carbon offsets one foregoes to generate co-benefits then depends on the relative value of each externality compared to carbon sequestration.

The example of biodiversity shows that the link between externalities and carbon sequestration is not monotonic, but depends on the project context and on the level of carbon sequestration. Indeed, Huston and Marland (2002) highlight that “plant diversity is naturally low in very productive areas

and reaches a maximum under relatively unproductive conditions". As shown in Figure 2, the link between carbon sequestration (through plant yield) and biodiversity thus switches from complementarity to substitutability along with the increase in the plant yield.

Figure 2: Link between plant diversity and carbon sequestration



Source: Climate Economics Chair from Huston (2005)

Currently, the trade-off between carbon sequestration and externalities is decided case-by-case by individual project developers, according to the relative value attributed to the different components of the projects, which depends on their convictions and priorities. In the future, it may be useful to have the priorities defined at a higher level of decision, although this might reveal complex because of the subjectivity of the relative value attributed to each aspect of a project.

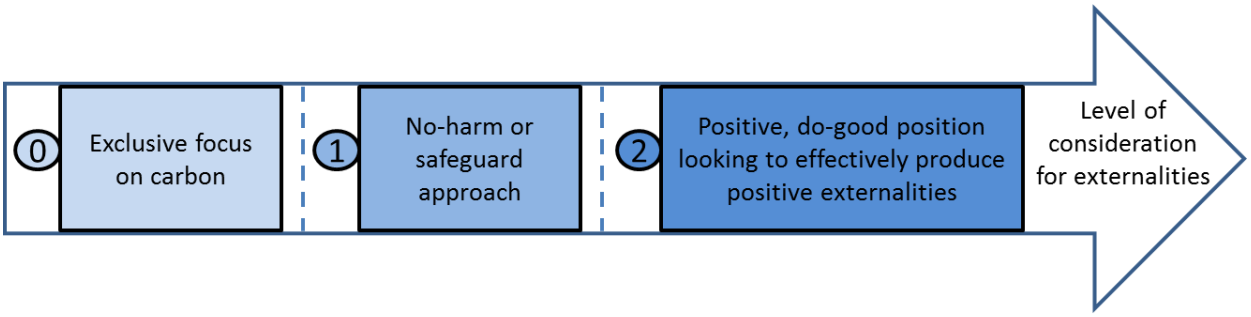
Regardless, a better knowledge of the trade-off frontier between carbon sequestration and related externalities could help project developers and policymakers make optimal decisions according to their priorities.

1.3. Three levels of consideration for externalities

As shown in Figure 3, there are currently three main positions regarding whether and how social and environmental co-benefits should be considered as part of forest carbon.

0. **No consideration** for externalities: this extreme position is rarely adopted because forests are now recognized as a special ecosystem where emission reductions cannot be planned without considering other environmental and social issues.

Figure 3: Three levels of consideration for externalities



Source: Climate Economics Chair

1. **No-harm** position: Arguing that forest carbon's main objective is to reduce GHG emissions, some believe that a forest carbon regime should establish **safeguards** to avoid the potential social and environmental damages of achieving the GHG mitigation target.

   As explained in Box 1 below, this is the position adopted in the negotiations for a global REDD+ mechanism, because of their concern about several potential negative externalities, for example : the conversion of natural forests to plantations, displacement and relocation of indigenous peoples and forest dependent communities, the loss of or reduced access to forest products important for local livelihoods, etc. (Moss and Nussbaum, 2011). These precautions are in line with the progressive switch from a "fortress conservation" – a top-down approach which sets limitations for resource use by local people (Vihemäki, 2005) – to a community conservation (or participatory approach) which seeks a better involvement of local people (Haller et al. 2008).

Box 1: REDD+ negotiations adopt a safeguard approach

Even though the primary aim of REDD+ is to participate in the fight against climate change, it is believed that forest preservation cannot be addressed only from the perspective of emissions mitigation. Rajendra Kumar Pachauri, Chair of the IPCC, suggested that "we cannot fall into the trap of looking at forests though only one lens: carbon".

The suggestion of addressing the non-carbon impacts of forest carbon was at first rejected by some developing countries fearing that adding environmental and social requirements could lead to their exclusion from the mechanism. However, it is now broadly accepted that forest carbon will not succeed without taking some minimal precautions. The Cancun Agreement formalized the recognition of environmental and social issues by establishing guidance and safeguards for REDD+. It states that "when undertaking activities referred to in paragraph 70 of this decision [Cancun

Agreement[1]], the following safeguards should be promoted and supported (Cancun Agreement – UNFCCC COP 16 / CMP 6):

1) Actions complement or are consistent with the objectives of national forest programs and relevant international conventions and agreements;

2) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty;

3) 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 United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;

4) The full and effective participation of relevant stakeholders, in particular, indigenous peoples and local communities, in actions referred to in paragraphs 70 and 72 of this decision;

5) Actions are consistent with the conservation of natural forests and biological diversity, ensuring that actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits;

6) Actions to address the risks of reversals;

7) Actions to reduce displacement of emissions.

The reporting framework for the safeguards remains an important debate. At the 35th session (19th October 2011) of the Subsidiary Body for Scientific and Technological Advice (SBSTA), all parties acknowledged that the safeguard system should be nationally led, yet abiding by common rules. The main obstacle at this stage is weak informational and institutional arrangement in some countries.

Negotiations at Conference of Parties (COP) 17 in Durban (December 2011) led to the decision that Parties will have to periodically provide a 'summary of information' on how the safeguards established in Cancun are addressed and fulfilled. It was reinforced that the reporting system for safeguards will take into account national circumstances and respective capabilities.

2. **Maximize co-benefits**: The last position considers that, for the sake of equity, social progress and environmental good, forest carbon should act positively and generate co-benefits. The case for a more positive approach to co-benefits in forest carbon is in large part based on procedural and

[1] http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=2

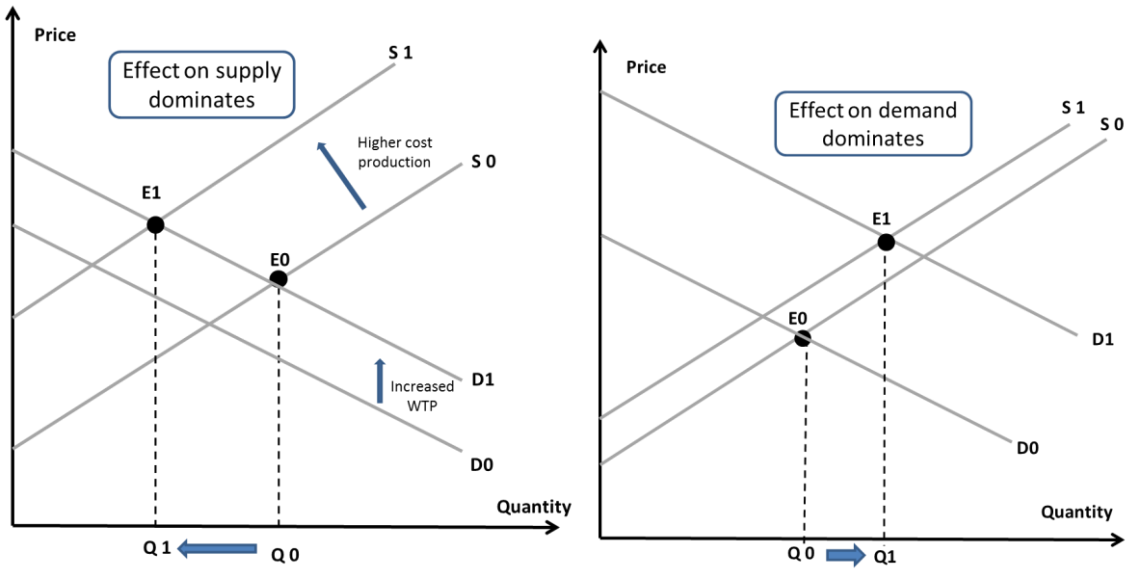
ethical arguments. The procedural one, outlined by Brown, Seymour & Peskett (2008), rests on the numerous cross references that exist between forest climate negotiation and other international provisions; for instance with the Millennium Development Goals, the United Nations Forum on Forests, the Convention on Biological Diversity, the United Nations Declaration on the Rights of Indigenous People etc. The ethical argument says that the lifestyle and the organization of people which depend on forests and ecosystems should not be affected by unilateral external intervention and that decisions regarding global public goods should not be made by relatively few outside actors. On the contrary, forest carbon has the potential to help achieve human and environmental improvements and their fulfillment should be at the core of carbon projects.

1.4. Analytical effect of an increase in the level of requirement

This section presents a theoretical illustration of the consequence of moving from a situation E_0 where externalities are ignored to a situation E_1 where safeguards are established.

Mutatis mutandis, generating credits of high quality credits, by taking into account the social and environmental impacts of forestry projects, entails additional costs for the project developer compared with a project focusing on carbon sequestration only. Such costs are detailed in section 2.1.c. Taking into account the externalities thus leads to the contraction of credits supply, illustrated in Figure 4 by the translation from the supply curve S_0 to S_1.

Figure 4: Effect on transactions of an increase in the level of requirement



Source: Climate Economics Chair

Theoretically, a second effect might counterbalance the contraction of credits supply. Indeed, a high level of requirement on externalities can generate a specific demand for the high quality credits issued if there is a willingness to pay (WTP) for the co-benefits. This process is illustrated by the translation from the demand curve D_0 to D_1.

Depending on the elasticity of supply and demand for co-benefits, the increase in the level of interest for externalities will either result in an increase (left) or a decrease (right) in the quantity (Q) of forestry credits transacted.

2. Addressing externalities in the voluntary carbon market

The majority of forest carbon transactions (92% in volume) take place in the voluntary market, the total amount of forest carbon credits transacted in this market reaching 27.6 $MtCO_2$ in 2010 (Ecosystem Marketplace, 2011a).

To analyze how the voluntary market addresses externalities, this section analyzes the requirements of the main standards developed in the voluntary market as well as the results collected from two surveys led by the Climate Economics Chair and by Astrium Services.

2.1. Lessons from a first survey

The first survey, led by the Climate Economics Chair, rests on semi-directive questionnaires submitted to players in the forest market (see Annex 1). Seventeen persons from fifteen different organizations were interviewed, including project developers / credits sellers (Permanent Forest, Eco-Carbone, ONF International or ONFI, First Climate, Ecosystem Restoration Associates or ERA, South Pole Carbon Asset Management), investors (Althelia, Livelihoods Fund), forestry credits buyers (Eneco, Forest Carbon Group), NGOs (Marina Gavaldão from GERES - Groupe Energies Renouvelables, Environnement et Solidarités), and standards (Voluntary Carbon Standard or VCS, Climate Action Reserve or CAR, Gold Standard and Panda Standard).

a) Investors and project developers arguments

Investors and project developers justify the pursuit of positive externalities by the following arguments:

- **Risk management**: Forestry activities by nature entail more risks - notably natural and anthropogenic ones, than most classic industrial activities (Bouculat and Chenost, 2010).

According to project developers and investors, a project where the social and environmental aspects are tackled is more sustainable, so the risk that the project collapses diminishes. Indeed, the more local authorities and communities endorse the project and get clear benefits out of it, the more they will care for the fragile restored or conserved ecosystem on the long run.

- **Fitting with voluntary offsetters' demand**: Focusing on externalities addresses a specific demand of voluntary offsetters for high quality forest carbon credits. Offset buyers, or firms that invest directly into forest carbon projects, do so for a variety of reasons that also depend on their business and corporate culture. They are wary of what is called 'greenwashing' and pay more and more attention to the quality of the credits and their robustness. Among the reasons invoked by corporates to purchase forest carbon credits we find not only Corporate Social Responsibility (CSR) considerations but also, and more meaningfully, internal stewardship, exposure to new business models and, in some occasions, real synergies with their own businesses. It is certainly more difficult to achieve this kind of endorsement from corporates' management and staff if the project they source credits from delivers *only* a carbon benefit. They need charismatic carbon credits, which is often the case for instance with forestry projects involving local communities. Investing in forestry projects with a demonstrated positive impact on biodiversity and local community increases the probability to find a buyer.
- **Access to new markets**: Investors are uncertain about the future of forest carbon. They trust that some other values, mainly environmental services, might find a market in the mid-term. Focusing on co-benefits in forest carbon projects may be seen as a diversification mechanism used by investors to cope with the uncertainty about the future of forest carbon finance.

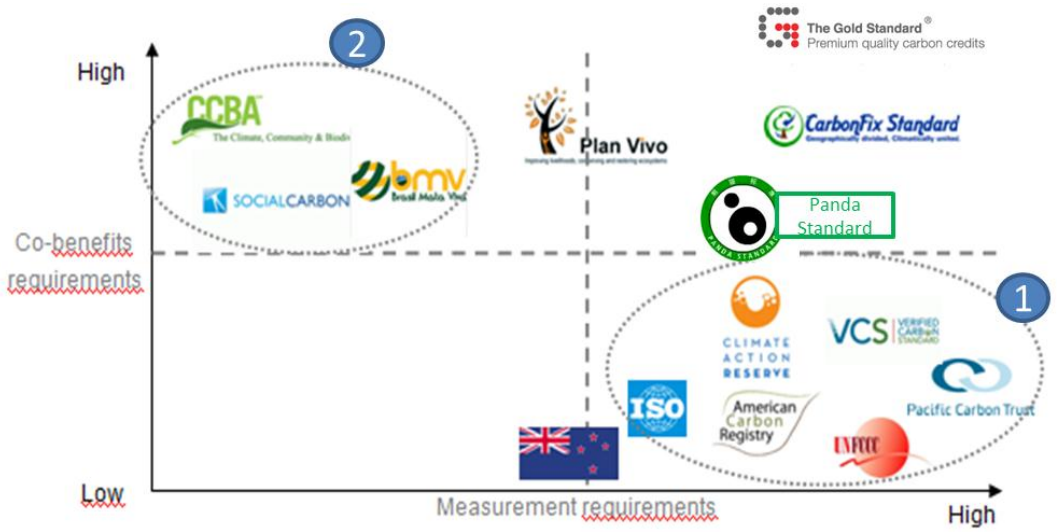
b) Lessons from the use of the standards

Over the last years, several carbon standards emerged in the voluntary market. According to Ecosystem Marketplace, virtually 100% of forest carbon credits traded in 2010 used an external standard. As shown in Figure 5, the market is split among a dozen different standards, but two main groups can be identified regarding considerations for externalities.

The **first one** corresponds to standards with a strong **focus on carbon accounting**. Measuring carbon fluxes in the forestry sector is very challenging because of the complexity of monitoring the changes in forest area and of assessing the carbon stock per hectare, which is specific to each forest (Simonet and Bouculat, 2011). Due to this complexity, such carbon standards do not try to specifically generate co-benefits but endorse a no-harm policy regarding externalities. The standard most widely used in

forest carbon projects, the VCS (54% of market share in 2010), adopts this policy. VCS's Naomi Swickard states that "the VCS is a carbon standard, so it does not absolutely require additional co-benefits, but it does require that projects looking to issue VCS credits identify potential negative environmental and socio-economic impacts and [to] take all steps to mitigate them". It also bars projects that "convert native ecosystems to generate GHG credits"[2].

Figure 5: Standards mapping



Source : Astrium Services and CEC

In a **second group** stand standards with **high co-benefits requirements**. Due to the current lack of standardization in the way to measure and report co-benefits, such standards generally proceed in a qualitative way. The most commonly used is the Carbon Community and Biodiversity (CCB) standard. To qualify to the standard's basic level, projects must demonstrate they have a positive impact on the climate, on community well-being and on local biodiversity. There is also a 'gold' level, for which projects must demonstrate they generate 'exceptional' benefits. Even if the CCB provides for a thorough analysis on the social and environmental impacts of the projects, it is viewed by some as merely "a certificate of good social and environmental impacts. It provides neither quantification nor monetization of these impacts" says ERA's Frédéric Jacquemont.

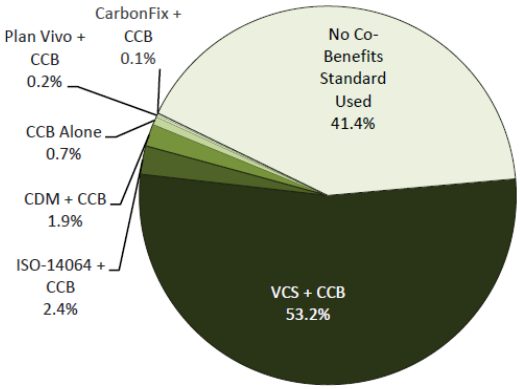
Quantifying the co-benefits represents a significant challenge. Ollie Belton from the PFSI (see section 3.1) commented that "although co-benefits are easily identified, they are harder to quantify". Some natural capital components can be easily quantified (e.g. water quality within the project area can be

[2] *VCS Agriculture, Forestry and Other Land-Use (AFOLU) requirements*, version 3.

assessed through modeling and quality tests), but it is more complex to quantify the social impacts of the projects. The Panda standard is currently designing a 'Poverty alleviation tool', which aims at defining some indicators (based for example on job creation, income improvement or rural development) to quantify the social impact of their agriculture and forestry domestic projects (Wen Wang, CEC and Bluenext, personal communication). This is one among other initiatives towards quantifying the social impacts of a project.

As shown in Figure 6, the current trend is to use a **double certification** by combining a "carbon" standard, with a "co-benefits" one, the most common association being VCS + CCB.

Figure 6 - CCB standards market share



Notes: Percentages are based on market share by volume of primary market transactions contracted in 2010 (29.0 $MtCO_2$ total). Projects must be verified under a carbon quantification standard in order to be issued verified offset credits.

Source: Ecosystem Market place, 2011

In June 2012, the Gold Standard Foundation[3] announced its decision to expand its project scope to land use and forestry. This standard adopts a holistic approach when certifying carbon projects, with both carbon accounting and co-benefits requirements. It will provide safeguards and MRV for co-benefits, and recognize the value of non-carbon attributes (Gold Standard, 2012). Its extension to forestry projects might enhance the production of credible and high quality credits.

A possible next step towards externality valorization would be to find a way to improve the quantification by defining a unique metric. In the line of this target, the Global Conservation Standard[4] is currently designing a Conservation Credit Unit (CCU) that would encompass several benefits including carbon, water or biodiversity. However, this point appears to be quite complex because it requires giving a relative value to each externality whereas there is an undetermined

[3] The Gold Standard proposes a framework to qualify compliance Certified Emissions Reductions (CER) to « Gold Standard » CERs, by such giving them a certification of high quality beyond carbon. More than 600 projects and more than 40 millions GS tonnes of CO2 issued and pending in 2011. See http://www.cdmgoldstandard.org/.

[4] http://www.globalconservationstandard.org/home.aspx

number of existing externalities which differ by nature and the assessment of the relative value of externalities is a subjective issue.

c) Extra cost and benefits of valorizing externalities

For a given project where the project developer has the possibility to choose between lower and higher quality credits, we have: $\mathbf{C2 = C1 + \alpha + \beta}$

Where: C1 is the cost of producing n°1 low quality credits – with no or little co-benefits;

C2 is the cost of producing n°2 high quality credits– with co-benefits;

α is the additional cost per generated credit of designing and implementing activities targeted to enhance the credit quality;

β is the cost per generated credit of certifying and monitoring (e.g. surveys to assess the social impact) the enhanced credit quality, and other transaction costs.

The value of α depends on the complementarity of carbon intensification and co-benefits generation. In a given project, the higher the complementarity of both components, the lower is α. Some project developers commented that, as their projects already focused on the social and environmental components, this cost was already partly internalized.

β includes a fix cost that corresponds to the certification and whose value depends on the frequency of the verification required by each standard. β also includes the cost for monitoring the externalities. Project developers find it hard to assess β, notably because some of the expenditures are closely mixed with carbon monitoring ones. This cost may be significant if we refer to the estimates made by Richards and Panfil (2011) when applying the Social and Biodiversity Impact Assessment (SBIA)[5]. Resting on three case studies (REDD projects of between 146,000 and 553,000 hectares in Brazil, Guatemala and Peru) the authors assessed that "the cost of generating a credible social monitoring plan using their approach will be in the range of $25,000-35,000 depending on various factors". Some project developers say it can be a lot more, in the range of a multiple of 100,000€ for complex projects.

[5] To compensate for the lack of guidance to measure the "non carbon" impacts of forestry projects, the CCBA and three other leading NGOs recently published a manual focusing on the Social and Biodiversity Impact Assessment of forest carbon projects, intended to project designers and implementers. More data on http://www.forest-trends.org/publication_details.php?publicationID=2981.

Under any assumption β is in all cases a strictly positive figure, so that C2 is strictly above C1. Taking into account the “non carbon” components of a project increases the cost for producing one carbon credit, but it does not necessarily double this cost compared to carbon alone because several costs are not reproduced (notably the purchase and interpretation of satellites images which creates significant costs). As explained in Box 2 below, this extra-cost can be discouraging for project developers. They can also be slowed down by the complexity of certifying projects involving several landowners, which is often the case in projects with high social co-benefits. However, ensuring the robustness of the offsets regarding emission reductions is essential, and this step is necessarily more complex when a large number of landowners are involved. It should be noted that VCS and CCB are currently working together to streamline the application of both standards, which should simplify the process of double certification.

As valorizing externalities entails extra costs, we can wonder whether it is worth the effort to look for a certification which goes beyond carbon. Will this effort be paid for by a premium? Among the interviewed people, opinions are divergent on this issue. Some said there is “no explicit premium”, arguing that forestry credits are already sold at quite a high price and buyers have a price ceiling they will not exceed. In contrast, several participants say that forest carbon offset buyers want more than just carbon, so that they are willing to pay a premium. Florian Reimer from South Pole commented that “Forestry Credits are "charismatic" credits, meaning they mostly have nice stories to tell; therefore they sell at a higher price”. Finally, it is hardly possible to generalize as the market for those offsets is mainly over-the-counter, with a high scarcity of publicly available data. The price premium is very dependent on the type of project and on the willingness-to-pay of each offsetter.

However, even if co-benefits do not necessarily lead to a premium, omitting them appears to be detrimental for project developers because it reduces the demand. According to Ecosystem Marketplace (2011a), “the broad application of co-benefits certification under the CCB standard suggests that the market has set a key requirement that projects must deliver benefits to biodiversity and communities to find a broad appreciation among buyers”.

In the voluntary market, the theoretical effect on demand described in section 1.4 is actually observed. Indeed, credits buyers show a clear demand for high quality credits, illustrated by the development of credits with double certification. Although generating co-benefits does not necessarily lead to a price premium, it currently appears as a requirement to sell in the voluntary market. Our main conclusions are corroborated by a second survey led by Astrium Services.

Box 2 – A case study to highlight the difficulties of valorizing co-benefits, by Eco-Carbone[6]

Jatropha Mali Initiative (JMI) is the Malian subsidiary of the French company Eco-Carbone (EC). JMI offers farmers to grow trees in their cultivated plots using agro-forestry systems and guarantees them to buy the seeds at a minimum price fixed in advance. The company will operate in the future through the sales of transformed products.

This scheme can only work in the long term if the trees and the prices proposed to farmers suit them, bring them benefits and do not cause environmental or food security problems. If not, they will either abandon the crop or not sell their seeds. JMI will therefore not be able to operate anymore. Co-benefits are thus at the core of EC and JMI strategy for the development of a farmer-based jatropha sector in rural Mali. Furthermore, these externalities are an intrinsic condition for its survival.

Carbon finance has been considered from the beginning (2007) as an innovative solution to develop the project and give a value to the carbon stored in the newly planted trees. However, EC faced several difficulties at the time of applying this strategy.

First, while carbon finance would be required to start the project, the carbon assets can legitimately be issued only when the carbon is actually stored. Carbon finance thus arrives at a time when fruits are produced, so JMI and farmers have another source of income. Prepayment of carbon assets is thus a critical aspect of the process. Fortunately, JMI had the opportunity to develop a unique partnership with a company ready to trust and prepay the carbon assets, but this remains exceptional.

Second, the positive externalities cited above drastically increase costs and difficulties of the carbon certification. Methodologies and standards are not flexible enough to fit with the project reality. Having many small, unlinked and very varied plots compels to go through a « grouped project » process. Implementation and monitoring are very challenging: contract signature with thousands of farmers, georeferencing and monitoring of thousands of remote plots, implementation of a geographical information system and database, obligation to have dedicated staff, etc.). Paradoxically, obtaining carbon assets with a managed plantation of several thousand of ha with almost no positive externalities (if not negative ones!) would have been much more simple! Despite all these barriers, the project has completed in 2012 a validation by DNV as the first forestry grouped project under the VCS.

Third, valorizing co-benefits with an additional certification for social benefits leads to such an increase in human resources, working time and costs that it not really conceivable. For example, the necessity of surveys in each village for CCBS would generate too much investment for uncertain benefits.

As a conclusion, using carbon assets as a positive development tool is complex and requires exceptional circumstances (a buyer ready to prepay, a mother company who did all the important work of establishing project document, etc.). Linking carbon assets, positive externalities and development would thus require more adapted ways of certification and standards that do not yet exist.

Nevertheless, without carbon finance, this project would never have existed and it is a proof of the potential of carbon as a crucial mean for development.

[6] http://www.eco-carbone.com/index.php?lang=fr

2.2. Lessons from a second survey: accuracy versus co-benefits

In order to acquire a better understanding of carbon markets demand for carbon measurement accuracy, Astrium held interviews (see questionnaires in Annex 2) with market players from the public and private sectors and focusing on all forest carbon project types (IFM, A/R, REDD). They mainly come from Europe and North America. Astrium also interviewed standards, as they set the trends in a still immature carbon environment. Based on semi-directive questionnaires, 22 interviews were conducted and fed into a comprehensive database. The answer analysis uncovered requirement trends and led to the following conclusions:

- While carbon measurement accuracy was at first expected to be the key driver, the collected answers evidence a range of drivers including not only accuracy but also co-benefits.
- Within the voluntary market, project developers and credit buyers have different interests leading to the prioritization of different drivers. Most project developers aim at maximizing the project return. Carbon measurement accuracy is therefore a priority for them for two main reasons: (1) an improved accuracy may have a positive effect on the buffer[7], hence optimizing the number of verified credits and (2) an efficient carbon monitoring system may help reduce project monitoring costs.
- However, most current carbon measurement techniques still deliver rough results and forest carbon standards are not perceived as very demanding. In any case, accuracy is expensive and is not clearly reflected in credit prices. Therefore many project developers also look to co-benefits as a component of carbon credits to seek better prices. (As an example, one of the interviewees in North America focuses on ecosystem services and blue carbon as a way to attract the highest premiums.) Project developers' efforts are devoted to meet the requirements from the most sought standards to secure credit buyers demand.
- Credit buyers aiming at complying with CSR-type commitments or willing to go greener say they are willing to pay premiums for carbon credits with environmental and/or social co-benefits.
- In the absence of agreed upon methodologies to quantify co-benefits and of a market for them, there is no reference premium for carbon credits including co-benefits. The range of premiums is wide and mainly depends on the story around projects, the adequacy of co-benefits with credit buyers' specific requirements, the standard or standards achieved by a project.

[7] The buffer is a provision to cover for potential subsequent unexpected losses in the carbon stock. They are required by some standards for forestry offsets, such as the VCS.

- Few credit buyers claimed to be only interested in reducing their carbon footprint, in which case they looked for carbon measurement as a means to ensure the integrity of credits. In this case, there is no willingness to pay a premium for co-benefits and pricing dynamics of such carbon credits are close to that of a regulated carbon market.

- REDD projects funded by the public sector (multilateral or bilateral) are still not mature enough to issue carbon credits. Nevertheless, the interviews evidence similarities between the requirements from private credit buyers and public funders. Measurement accuracy is required. The targeted precision varies according to funders' requirements although there is a trend towards setting IPCC Tier 2[8] as a first target along with the expectation for simplified methodologies. Co-benefits, or at least the absence of negative externalities, are also required. This is mainly evidenced by the safeguards defined by multilateral funders.

- In parallel, the interviews also show that the respective weight of each feature is still unclear, depending on the requirements of funders and the ability of developers to deliver. For the future, interviewees anticipate a change, with the standardization of carbon credits as a pre-condition for the emergence of a full-fledged forest carbon market. The ability to quantify co-benefits will become critical. Current premiums of the voluntary market should disappear.

- Due to the significant role played by standards, as rule setters for the quality assessment of carbon credits, interviews were extended to a small panel of standard representatives. Accuracy and co-benefits are considered by most of them with different rankings. The range extends from exclusive focus on co-benefits to exclusive focus on accuracy. None of the interviewees denied the relevance of both components to assess the quality of a carbon credit. Their suggestion to credits buyers is to combine different standards to ensure the targeted quality is delivered.

[8] The IPCC GPG and AFOLU Guidelines present three general approaches for estimating emissions/removals of greenhouse gases, known as "Tiers" ranging from 1 to 3 representing increasing levels of data requirements and analytical complexity.

3. What strategy for externalities in compliance carbon markets?

The forestry sector is dramatically under-represented in CDM with 67 A/R projects (0.8% of the total number) in the pipeline and 4.1 million temporary CERs issued as for June 2012 (UNEP-Risoe). This can be explained by the methodological complexity of using temporary credits and by the lack of demand resulting from the exclusion of forestry offsets in the EU ETS.

As explained in section 2, forest carbon succeeded better in the voluntary than in the compliance market but this trend could change. Indeed, the voluntary market is often considered as a testing ground for future compliance markets. Several regional carbon regimes already integrated the forestry sector, like in New Zealand, in the New South Wales (Greenhouse Gas Reduction Scheme), in the Northeastern United States and Eastern Canada (Regional Greenhouse Gas Initiative). Other markets might follow this trend, notably in California and in Australia.

In the hypothesis of compliance markets replacing the voluntary, what would happen with externalities? Most of the forest market players interviewed in the previous two surveys fear that a future integration of the forestry sector in compliance carbon markets could catalyze the production of cheap carbon credits with no or little consideration for the overall sustainability of the project. Naomi Swickard (VCS) comments that "such markets often are in search of the lowest price offsets and care less about the story. However, positive socio-economic and environmental impacts are an integral part of forest carbon activities and should be included as requirements in any compliance market". The exclusion of certain projects (notably Hydro Fluorocarbon ones) in the CDM market shows that there is a gradual move towards "greening" compliance carbon markets. Moreover, Adrian Rimmer (CEO of Gold Standard) reckons that even if most firms subject to a compliance market do not really care about carbon credits quality, some of them nonetheless try to combine their obligation to comply with an emission target and their CSR strategy.

To discuss this issue of the integration of externalities in compliance markets, we analyzed two case-studies, with a focus on externalities: New Zealand which already integrated the forestry sector in its national carbon economics, and California, whose carbon market to come should accept forestry offsets and notably international RED offsets.

3.1. New Zealand: a two faced strategy for forest carbon's externalities

New Zealand has been a pioneer nation in integrating the forestry sector in carbon markets. In 2007, the government set up the first carbon crediting mechanism for forestry, called the Permanent

Forest Sink Initiative (PFSI), followed by the inclusion of the forestry sector in the New Zealand Emissions Trading Scheme (NZ ETS) in 2008.

- **Two schemes with a different level of requirement**

While both initiatives provide incentives to halt deforestation and enhance carbon sequestration in national forests, they differ in their requirements on harvesting and permanence.

The **PFSI** applies **rigorous safeguards**: clearance and clear-fell harvesting are limited[9] to ensure the maintenance of the structure and canopy of the forests and forest cover must be maintained at least 99 years. Even if there is no obligation to report the co-benefits generated by the projects to get the PFSI standard, the high level of requirement of the PFSI may reduce the risk of generating negative externalities and result in co-benefits.

The **NZ ETS** makes an **exclusive focus on carbon**, with almost no consideration for externalities. According to Permanent Forests International's[10] Ollie Belton, the additionality is not always respected under the NZ ETS because no change in forest management is required and the rules are compatible with timber harvesting. Moreover, he says that this scheme could enhance the development of monoculture with a high potential for carbon sequestration, which reduces the biodiversity of the ecosystem. He notes that "one species (*radiata pine*) already accounts for approximately 89% of planted (Kyoto eligible) forests in New Zealand, and close to 100% of all new forests being established under the NZ ETS continues to be radiata. The authorization for NZ ETS credits to proceed with periodic clear-cut harvesting does not guarantee most of the environmental benefits achieved with permanent forests, like "biodiversity gains, regeneration of indigenous plant species, more diversity of forest structure and habitat, soil stabilization, water quality enhancement".

- **Consequences on price and transactions**

Compliance market: no verified difference in the price: As shown in Figure 7, the NZ ETS and the PFSI are linked because owners of forests planted after 1989 can voluntarily participate in either of the two schemes. A key difference is that forest owners involved in the NZ ETS receive New Zealand

[9] A maximum removal of 20% of the forest's basal area from any one hectare is allowed

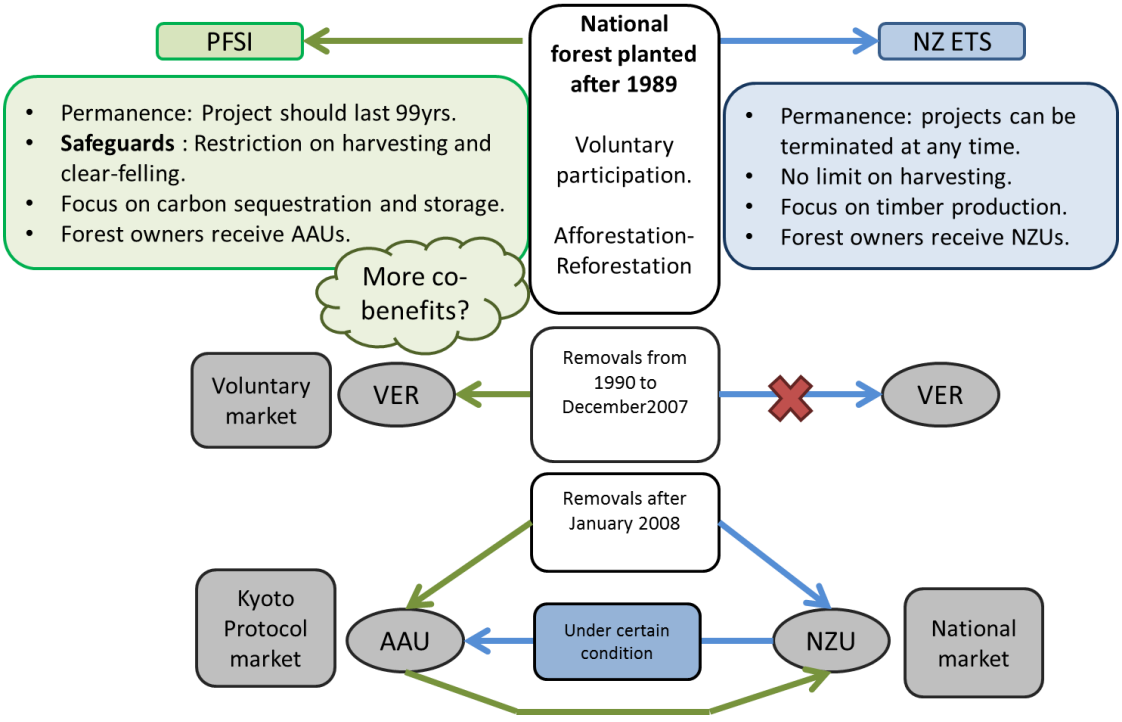
[10] Specialists in carbon forestry investments including project development, forest offset aggregation and brokering, and consultancy on carbon forestry policy and markets. See http://www.permanentforests.com/

Units or NZUs[11] they can only sell in the domestic market, whereas PFSI forest owners directly receive Assigned Amount Units (AAUs)[12] which are also tradable in the international Kyoto market.

Despite the *a priori* higher quality of forests qualifying under the PFSI, Carbon Farming Group (2011) states that there has been "no discernible difference in pricing". Nevertheless Permanent Forests International, who has transacted 90% of all PFSI AAUs to date, has achieved premiums on occasions to compliance buyers, and in one case a 25% one compared with NZUs (Ollie Belton, personal communication).

Although not leading to a premium, the difference in credit quality might generate a specific demand. For example Denmark bought PFSI AAUs for its Kyoto compliance and, according to Ollie Belton, "Denmark would not buy NZ ETS units because they did not like the attributes, specifically non-permanence". The case of Denmark is still marginal, but one might expect that as market demand evolves, some players start buying "greener" credits by themselves.

Figure 7: Forestry projects under the PFSI and the NZ ETS, and links with other markets



Source: Climate Economic Chair

[11] Convertible into AAUs under certain conditions

[12] As a member of the Annex 1, New Zealand receives Removal Units (RMUs) for the carbon sequestered in national forests. However, it was decided that landowners will receive AAUs which are easier to sell. See http://www.motu.org.nz/files/docs/MEL0284.pdf for details.

Voluntary market: a specific demand for co-benefits: Removals and emissions reductions from before 2008 cannot generate NZUs or AAUs. An option for forest owners having started projects before that date is to generate Voluntary Emissions Reduction (VERs) that they can sell in the voluntary market. Previous attempts to sell forestry credits from the NZ ETS in the voluntary market failed. According to Ollie Belton, "buyers in the voluntary market require high standards of environmental integrity associated with the forest projects, particularly permanence. Because of this, there is no appetite for NZ ETS units in the voluntary market. Conversely, PFSI AAUs have even been sold to voluntary buyers and have achieved a price premium over the NZU price of up to ~30%".

- **Discussion: What is the good level of requirement?**

The comparison between the two schemes raises the issue of the good level of requirement for forestry projects in terms of impact. As explained in section 1.4, increasing the level of requirement might have two opposite effects on the supply (S) and on the demand (D) of forest carbon credits. The additional cost for producing one ton of carbon might reduce the supply, whereas the creation of high quality credits might increase the demand if buyers show willingness-to-pay for co-benefits. The final quantity of forestry offsets transacted will depend on the level of each effect.

In the case of New Zealand, both effects are observed. As shown in the Table 2 below, the higher flexibility of the NZ ETS clearly attracts more forest owners than the PFSI, with around twenty times more hectares in the NZ ETS. However, the higher quality of PFSI credits generates a specific demand on the voluntary market and from Denmark, raising the assumption that forestry offsets with a high level of consideration for externalities may more easily access an international market.

Table 2 - Supply and demand of NZ and PFSI forest carbon credits

	Supply – number of forest owners and ha	**Supply - quantity of credits issued**	**Demand - quantity of credits sold**
NZ ETS	End of 2011: 1847 participants and 257,796 ha.	7.7 million tCO2e issued in February 2011 (Ministry of Agriculture and Forestry)	**NO DATA for compliance** No credits sold in the voluntary
PFSI	End of 2011: 35 participants and 10,758 ha.	250,000 tCO2e issued as AAUs at the end of 2010 (MAF)	200,000 AAUs sold in compliance + 500,000 credits sold in the voluntary

Source: Climate Economics Chair with data provided by Ollie Belton

Although we lack from updated data on the quantity of credits issued and sold in each scheme, we can guess that the contraction of credits supply is more significant than the potential positive effect on demand. This analysis is in line with the analytical frame presented in Figure 8 p 25.

Beyond the number of carbon credits issued and sold, what should be considered is the real impact on climate change. Albeit more flexible rules increase the climatic impact of the system by attracting more forest owners, this may result in fake climate change efforts if permanence is poor, or in negative externalities. The decision on the level of requirement thus depends on the relative value allocated to emission reductions and externalities.

3.2. California: positive externalities required for international forestry offsets

Forest carbon players are looking carefully at California, since its future compliance carbon market might accept both domestic and international forest carbon credits. In 2006, Governor Schwarzenegger signed the Global Warming Solutions Act (AB32), which requires California to develop regulations to reduce greenhouse gas emissions to 1990 levels by 2020. The implementation of a Cap and Trade has been enacted, with a setting up scheduled in January 2013. Firms will be left with the opportunity to offset their emissions up to 6%.

The California Air Resource Board (ARB) is the structure in charge of implementing the California carbon market. As of January 2012, two methodologies for domestic forests[13] were validated. Moreover, the validation of one methodology for avoided deforestation in Brazil (Acre) and Mexico (Chiapas) is under discussion. These three methodologies are developed by the Climate Action Reserve (CAR or "Reserve"). We interviewed CAR's John Nickerson. Initially, CAR is a standard which "was founded to ensure the integrity, transparency, and financial value in the North American carbon market". Forestry projects under CAR are mainly Improved Forest Management (IFM) and 15% of the standard's total credits (21,185,935 in total) issued so far are forestry credits.

CAR seeks to verify high quality offsets. Both domestic and international forest protocols will take into account externalities, but with a different approach:

- California adopts a **no-harm position** (safeguards) for domestic projects, with a strong focus on environmental issues whereas social aspects are admittedly less of an issue in North America. Rigorous safeguards have been defined, with a focus on maintaining natural forests and ensuring

[13] http://www.arb.ca.gov/regact/2010/capandtrade10/copurbanforestfin.pdf and http://www.arb.ca.gov/regact/2010/capandtrade10/copusforest.pdf

species biodiversity. Just like in the PFSI, to ensure projects permanence and additionnality, a long term approach is adopted with an obligation to maintain forests during at least 100 years.

- Requirements for international forest carbon projects are **between a strict no-harm policy and a more positive approach**. Social externalities appear to be as important as environmental ones. After pondering the creation of their own externality accounting methodology, CAR opted for requiring Forest Stewardship Council (FSC) or CCB certification besides the CAR carbon requirements. This demonstrates that a compliance market can, at least in design, be as demanding as voluntary markets in terms of externalities.

3.3. Externalities in compliance carbon markets

- **What level of requirement for compliance markets?**

Assuming that forestry offsets will keep integrating compliance markets, what could be the level of requirement for externalities in compliance markets?

This paper defined three levels of consideration for externalities (Figure 3 p 7): a total focus on carbon, a safeguard position and a 'do-good' approach.

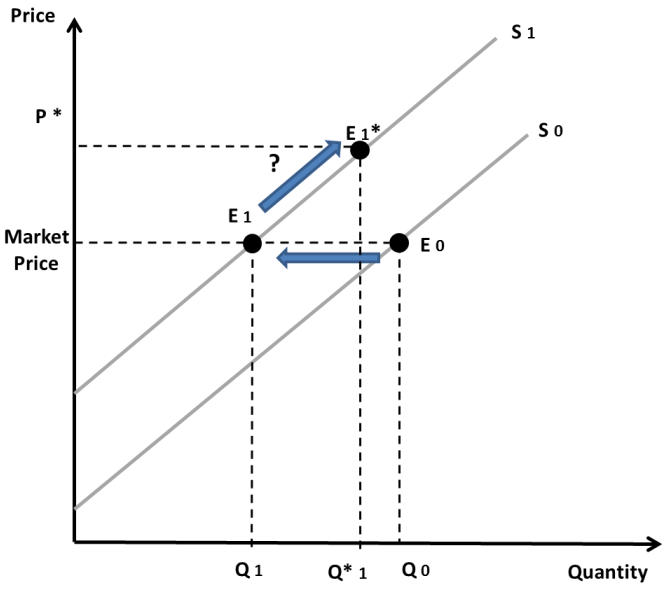
- The pure least cost option would give incentives for project developers to invest in large scale, carbon intensive projects and try to avoid any extra-cost to be competitive in carbon markets. Considering the current agreement on the necessity to prevent forest carbon from endangering biodiversity and local communities, this position is unlikely to be adopted.
- The adoption of a 'do-good'position, where forest carbon *must* by regulation generate positive externalities alongside carbon benefit, may be difficult and even counterproductive. International negotiations show that it is difficult enough to agree on a minimum no-harm common denominator. There is little prospect to eventually find a consensus on an overarching externality equivalence methodology able to set the standard for a market of carbon credits *cum* co-benefits. It may also be counterproductive because it might constraint forest carbon markets. Such high expectations are costly, and cumbersome to abide by, and may further degrade forest carbon's competitiveness, weakening its position within global carbon markets. They may also disqualify a number of sensible and 'harmless' projects unable to prove they generate positive externalities. There is a substantial risk that the supply effect on carbon credits is eventually very unfavorable.
- The 'no harm' or safeguards position is the most likely to be adopted. It would enable a market takeoff in volume terms while ensuring an acceptable quality. This position was notably adopted in international negotiations on REDD+ and in several compliance schemes. Just like California and the

PFSI in New Zealand, Australia chose a "no harm" strategy regarding safeguards. Forestry projects eligible to its future carbon price mechanism will be subject to a negative list which gathers "activities where there is a high risk that they will have a significant adverse impact on the availability of water, the conservation of biodiversity, employment, or the local community"[14].

- **Analytical analysis of the effect of the level of requirement on transactions**

In a commodity market, competition is price driven and the price of carbon credits does not reflect benefits other than carbon. Moving from a 'pure carbon' position to a 'no harm' approach might not have the same consequences than in the voluntary market. The effect of contraction of credits supply introduced in section 1.4 might not be offset by the potential increase in demand. As illustrated in Figure 8, with the supply curve S_1 and still the market price p, the quantity $Q_1<Q_0$ will be transacted. The case of New Zealand provides a good illustration of this process of contraction of the supply: around twenty times more hectares are involved in the NZ ETS than in the PFSI, this second scheme being much more demanding in terms of safeguards.

Figure 8: Quantities and prices of forest carbon offsets in a compliance market



Source: Climate Economics Chair

[14] http://www.climatechange.gov.au/government/submissions/~/media/publications/carbon-farming-initative/cfi-pos-neg-consultation-paper.pdf

Are high quality credits doomed to disappear? Not necessarily.

First, there is the possibility that some compliance buyers may be willing to pay a premium for high quality credits, notably those who take advantage of their compliance obligation to develop their Corporate Social Responsibility or implement innovative corporate strategies. However, this behavior might not happen at a significant scale.

Second, the price-competition effect might be mitigated if the forestry offsets do not compete directly with other types of offsets. A solution could be for example to allow a X% of yearly emissions to be offset by forestry offsets and Y% by other types of offsets, forestry offsets not being interchangeable with the other ones. In the case of California, forestry offsets will only compete with a few other types of offsets (livestock manure and ozone depleting substance) so that the competition with mainstream offsets will be limited.

There are other solutions for achieving a payment for externalities.

First, the voluntary market. In this market there is a demand for high quality credits. The success of double certification, mainly VCS+CCB, is an illustration of this demand for credits with co-benefits. According to Adrian Rimmer, CEO of Gold Standard, in the voluntary market "the underlying unit is still carbon, but what people are buying is sustainable development" (Bloomberg, 2012). The voluntary market can be seen as an experimentation scene, where innovative solutions to generate positive externalities are experienced. As the voluntary market evolves towards a better internalization of externalities, it might become an example for compliance markets, which would then be in a position to do so themselves.

Second, we can imagine a scheme where non-climate related sources of funding would pay for the positive externalities which are not rewarded by the market. Those funding sources may take the form of one or several funds specifically created for this purpose like, for instance, the Green Climate Fund - although its purpose is of course much broader than just rewarding forest carbon externalities. In this line, the debate between funds versus market to pay for REDD+ might not be founded: these two mechanisms might co-exist and even be complementary. More broadly speaking, if we consider that a forest carbon project generates a number of positive externalities, the challenge is to identify the ones among them for which there is an off-taker willing and able to pay. Such may be the case of a water utility company that would compensate a project for the water catchment services it provides, or a State willing to pay for a mangrove forest bio-shield protecting its shores from hurricanes.

Finally, some positive externalities may be stripped away from the carbon offset and traded separately in specific markets, for the externalities that effectively have a market. Environmental externalities are the most likely to be involved in such a process, notably through Payments for Environmental Services (PES) schemes which aims at quantifying the economic value of the services provided by ecosystems. According to Ecosystem Marketplace (2011b), there is a growing interest in biodiversity offsets and compensation, the main demand arising from the United States. At least USD 2.4-4 billion is traded yearly in this market, and around 180,000 ha were involved in biodiversity offset programs in 2010. There are also 288 operational payments for watershed and water quality trading programs in the world today (Ecosystem Marketplace, 2010). The development of these schemes could allow a forest carbon credit to trade its pure carbon component on a carbon market and seek additional payments for other, non-climatic benefits in another market.

Conclusion

This paper explored the 'non carbon' impacts, here called externalities, generated by forest carbon. The main externalities identified by forest carbon players are clearly the impacts – both positive and negative - on biodiversity and on the livelihood of forest dependent communities.

Depending on the nature of the project, the production of positive externalities can be either complementary or substitutable with the generation of forestry offsets. In a case of substitutability, there may be trade-offs between carbon benefits and non-carbon benefits in forest carbon activities. In other words, some forest carbon projects may have to give away a certain amount of carbon credits in exchange for co-benefits.

Forest carbon has so far mainly thrived in the voluntary market. It appears that co-benefits are now nearly an absolute requirement to sell forest carbon credits in this market. Buyers from this market need more than ensuring carbon sequestration only and have evidenced their willingness to contribute to the generation of such co benefits through the payment of premiums representing, for some deals, several times the price of a bare carbon credit.

In contrast, forest carbon is still only partially integrated in compliance markets, their exclusion from the EU ETS being the main limitation in terms of demand. However, the decision of the EU ETS might become an exception as evidenced by the cases of New Zealand, California and Australia.

Considering the current apparent consensus on the necessity to consider the social and environmental impacts of forest carbon projects, we assume that the future compliance markets accepting forestry offsets will at least require safeguards to achieve the 'no harm ' status described earlier. The extra-cost entailed by the application of these safeguards will necessarily increase the cost per carbon credit by a limited amount and there might not be a demand for higher quality and more expensive credits, since competition in compliance markets is price driven.

As a way out to the current status, this paper explored several possibilities to maintain the production of externalities beyond the voluntary market which, should it remain, may not be commensurate with the volume required to solve the natural capital depletion issue. As a reminder, the proposed schemes to maintain co –benefits are: the creation of a niche for forestry offsets to insulate them from other kinds of offsets; using funds to pay for the externalities; selling the value of some externalities, mainly environmental ones, on specific markets.

We expect that other stakeholders will propose alternative schemes sooner or later. As such, it is worth mentioning the ongoing initiative from a number of countries for the REDD + Social & Environmental Standards, which aims at supporting REDD + programs including effective social and environmental safeguards.

Whatever this future scheme aiming at ensuring the development of co-benefits in large markets, it shall be designed to meet a number of challenges amongst which the classification, the quantification and the valuation of co-benefits.

Annex 1: Survey led by the Climate Economics Chair

QUESTIONS for project developers/investors

1. **Presentation of the company:**

2. **Project description:**

Project type (REDD / A-R / IFM / agroforestry / other), Non forestry projects, Location, Area, Status (project started, registered; Credits issued, sold), Context (regional/national programs, voluntary).

3. **MRV and impact of the projects**

Value of MRV and accuracy:

3.1-Has a project ever been rejected because of MRV issues specifically? Why?

3.2-How do you assess the uncertainty of carbon emission reductions generated by your projects?

3.3-What is the most expensive step? (Image acquisition, data analysis, ground inventory…)

3.4-Do you think there is a demand for accuracy?

Externalities and certification choices:

3.5-Do the forestry projects you are currently developing have impacts other than emissions reduction? Are there some negative impacts that you would like to avoid? You can use the following classification "1.Environment and ecosystems 2.Local economy and population welfare 3.Local agriculture 4.Other" or choose you own one.

3.6-Who do sell your forestry credits (and other credits)? Compliance or voluntary market?

3.7-Do you think externalities mind for offsetters? What do you think is the willing-to-pay / premium of buyers for positive externalities? You can distinguish for this answer the case of the compliance and of the voluntary market.

3.8-Certification: are the projects certified? Can you explain the way you choose your standards?

3.9-Do you use a double certification? (CCB + XXX)

- If not, why not?
- If yes, What is the extra price for monitoring externalities?
  Are such credits easier to sell? Who buy them?
  What is the extra price you can sell credits with double certification?

3.10-What do you think matters the more for a credits buyer (compliance and/or voluntary): accuracy or co-benefits?

3.11-Can you give your opinion on the possibility of integrating externalities in a regulated market? Do you think it is the role of carbon market to take into account externalities? What possible problems could we face when mixing high quality forestry with cheaper credits?

QUESTIONS for offset buyers

1. **Presentation of the company:** Please briefly describe your company (location, activity, etc.).

2. **Carbon strategy:**

2.1- Does the company buy or plan to buy carbon credits?
What is the company's strategy with carbon purchase (Compliance, pre-compliance, CSR…)?
2.2- Do you specifically buy forestry credits?

- **If not:** Why? Do you consider such credits as more risky? Is it for price reasons?
- **If yes:**
  - Can you give project details (location, project type…)
  - What are the main criteria that you consider during the projects selection?
  - Do you buy credits certified by a specific standard? Which one and why?

2.3- Measurement and accuracy: Do you consider measurement issues specifically risky (risk of reversal, leakage, measurement uncertainty…) for forestry credits? Do you check the uncertainty in carbon reduction calculation? Does accuracy matter for you?

3. Externalities perception:

3.1- Do you take into account the potential environmental and social impacts of the carbon projects (in general)? And of forestry carbon projects more particularly?
Do you think most of offsetters do?
3.2- What are the main externalities that you can identify around forestry projects? (Starting with yours if you buy forestry credits)
Are there some potential negative impacts of the forestry projects that you want to avoid? You can use the following classification "1.Environment and ecosystems 2.Local economy and population welfare 3.Local agriculture 4.Other" or choose you own one.
3.3- Do you think forestry carbon credits are "Less / More / As" valuable as/than other carbon credits?
3.4- How much are you ready to pay for a project which creates co-benefits? (in euros / tCO_2)
3.5- Can you give your opinion on the possibility of integrating externalities in a regulated market? Does it seem feasible? In particular, how to tackle the issue of the fungibility of the forestry credits with other types of credits?

Annex 2: Survey led by Astrium services

1) Funds, project developers and NGOs

- **Market overview and forecast**

What are your forecasts for REDD and other carbon forestry projects? Price, volume, in the voluntary market ? Evolution of regulation in the US for compliance markets ?
Do you foresee new REDD methodologies? Do you lobby for a particular methodology or methodological evolution?
Do you lobby for your project to be nested into a regional/national program? What do you expect from the nested approach?

- **Project portfolio description**

Current project portfolio: area, location, scope, status…?
Are your current or planned projects comprised in regional/national programs? (Nested approach)
What is the average global area to be monitored? What are common specificities?
How are projects originated?
Ex-ante risk analysis?
What are the key requirements during project selection?
Deal-breakers? Necessary conditions?
Has a project ever been rejected because of MRV issues specifically? Why ?
How are your projects funded? Why such schemes? What were the difficulties to set up the financing schemes ?
Have you concluded partnerships / framework agreements for the development of projects or the commercialisation of credits?

- **Monitoring tools**

What data is monitored? Deforestation? Degradation? Natural regeneration? Carbon stocks?
What are your in-house tools for carbon assessment and modelling?
What are the methodologies used? What is the most challenging component of this methodology and why?
What are the tools used for Monitoring ?
Do you have a preferred tool?
Are images bought? If yes, what are their specifications such as resolution, nature? When do buy images versus using free images ?
Do you have the ability to process images?
Do you know what can be done with satellite imagery?
What are your projects' requirements in terms of frequency and scope (comprehensive vs. risk areas) of Monitoring ?
How do you deal with carbon rights and cadastries?
What are you project's accuracy requirements?
How do you value accuracy? What are the main benefits of accuracy ?
Do you think there is a price elasticity of accuracy?

What is your budget's share dedicated to MRV? Do you have an estimate of the per hectare price?
How is project data stored? Have you acquired IT capacity? Do you plan to use external services for MRV data processing and storage? Have you experienced problems with data storage?
Do you have on-going or planned partnerships with service providers (Academia, Foresters, Verifiers…)? And what is the scope of the partnership?

- **Monitoring goals**

Goals of your monitoring efforts? Project performance? Project Risk assessment? carbon stock calculation ?
Is your monitoring focussed on the top of the trees, on biomass with field measures ?
Do you include biomass changes in your monitoring?
Are you satisfied with the accuracy and reliability of your data? Do you wish to improve it?
What difficulties are you facing for carbon stock calculation?

2) Multi/bilateral funds, international organisations (focus on REDD)

- **Market overview and forecast**

What are your forecasts for REDD? Evolution towards a regulated market?
What is the biggest barrier to entry for countries to design REDD programs?
Do you consider that existing methodologies meet your requirements? Would you support new REDD methodologies? To achieve which results?
Do you expect the MRV reliability to be a driver of a successful project
As a public multi/bilat fund/international organisation, what do you learn from voluntary carbon markets? How do you assess methodologies/projects that are being implemented? Do you forecast a convergence and of which nature?
What do voluntary standards learn from you?
What do you think of "nested approach"?

- **Project portfolio description**

Current project/country portfolio: area, status…?
How do you identify and select countries, initiatives you would like to fund?
Ex-ante risk analysis?
On the basis of which key requirements do you select countries, initiatives you would like to fund?
Deal-breakers? Necessary conditions?
What were the identified shortfalls?
To what extent are you involved in pilot initiatives design/assessment? If yes, same questions.

- **Monitoring tools**

Beyond IPCCC practices, do you have MRV / monitoring expectations?
What are the methodologies you prefer / require? What is the most challenging component of these methodologies and why?
What are the reasons some countries fail to design a satisfactory MRV plan, generally speaking ?

Do you know what can be done with satellite imagery / remote sensing ? Should we create awareness ? For which kind of projects would you support remote sensing ?
What are your requirements in terms of frequency and scope (comprehensive vs. risk areas) of monitoring?
What are your accuracy requirements?
Have you developed “in-house” carbon modelling capacities? Why?
How do you value carbon measures accuracy?
What is the budget’s share dedicated to MRV? Do you have a target of the per hectare price?

- **Monitoring goals**

Goals for MRV should be: Project performance? Risk assessment? carbon stock evaluation?
Are you satisfied with the accuracy and reliability of your data? Do you wish to improve it?
Do you think Tier 3 to be a realistic objective for developing countries? In your countries portfolio, which one do you think will reach Tier 3 for LULUCF activities, and when?

- **Satisfied Requirements**

Are you satisfied with the accuracy and reliability of monitoring information you receive? What would you wish? Is the reliability / robustness of the MRV plan an argument when choosing to fund a project?

- **Unsatisfied needs**

What are the elements of the value chain of REDD projects you think are weak ? What would like to have? Is there an order of priority? Do you plan to ask for external services? What are they? In which priority?

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