I4CE
INSTITUTE FOR CLIMATE ECONOMICS
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Building synergies between sustainable forest management certification and carbon certification: what bases are there and for what impact?

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However, I4CE is solely responsible for the content of the study.

EXECUTIVE SUMMARY

What is carbon certification for a forestry project? What is the difference with sustainable forest management certification? How do these different frameworks interact today and what synergies can be built?

Coming from the work of the Club Carbone Forêt Bois, managed by I4CE, this study answers these various questions by presenting the characteristics and issues related to sustainable forest management certifications (e.g. PEFC and FSC) and carbon certifications (e.g. VCS (now Verra), Gold Standard, etc.).

A certification framework aims to overcome information asymmetry between producers and consumers of goods or services, by offering guaranteed information on the production chain. In the case of a company wishing to offset part of its emissions, carbon offset standards guarantee the carbon sequestration service provided by a forest and attributable to the forest manager. In the case of the purchase of a wood product, sustainable forest management labels attest to the respect of social and environmental criteria in forest management and wood processing.

The area of certified sustainably managed forest is modest globally - about 10% - but represent 15 times the forest area engaged in certified carbon offset projects. These two types of certification have different objectives but often promote similar forestry practices, while the types of stakeholders - forest manager, State, auditor, NGO, etc. - involved in the both frameworks overlap quite widely.

While both types of certification aim to promote better forest management, their objectives and the indicators taken into account differ: carbon certification estimates precisely the carbon gain and especially its additionality, i.e. the absence of deadweight effect. Sustainable management certification does not certify these two points but attests to the implementation of environmentally friendly practices and a continuous improvement approach to forest management. These differences impact the elements audited to obtain the certification.

The economic incentive given by the two types of certification is also different: premium on the selling price of wood on the one hand and revenue generated by the sale of carbon credits on the other. The costs associated with carbon certification are also higher than those associated with sustainable forest management certification, but it also allows the owner to generate much higher and earlier revenues as soon as the sale of carbon credits begins.

Currently, few concrete links exist between the two types of certification, even though their scope is becoming more uniform and closer connections are developing: for example, FSC submitted guidelines in 2017 to "demonstrate the impact of forest management on ecosystem services", including carbon, while carbon certification standards such as the Gold Standard allow double certification with FSC to demonstrate compliance with different sustainable management criteria. The implementation of joint audits is often mentioned as an option to reduce certification costs, but the gain in time is limited around 20%, according to experience with dual certification in agriculture.

Contents

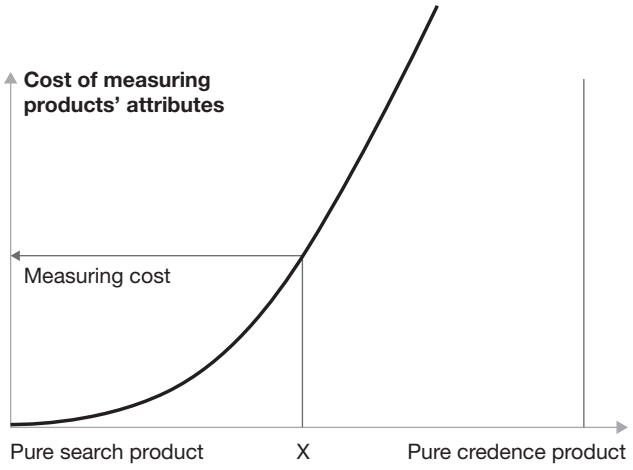
List of Figures and Tables

Introduction

"*Knowledge is power*". This is the opening of the article *The Economics of Information* (Stigler, 1961), a forerunner in the study of asymmetric information between sellers and consumers. The article shows how consumers' ignorance of products' attributes decreases with the "search" efforts they are prepared to make to find merchandise at a price that suits them. In conclusion, the article emphasises the key role played by a product's "reputation" in defining its price.

The information economy defines search, experience and credence goods according to the moment when buyers obtain information (or attributes) on the quality of the merchandise and the cost of obtaining the information (**Figure 1**).

FIGURE 1. DEFINITION OF PRODUCTS ACCORDING TO ATTRIBUTE MEASUREMENT COST



Source: Bougherara, 2004

When a household buys a wooden garden table, the product's characteristics, such as the variety of wood used, colour, price, etc. are directly available. These characteristics, which have a low measurement cost and can be assessed simply through observation, make the item a search product (Nelson, 1970).

Attributes whose determination cost is high before purchase but low after acquisition constitute experience products. In our example, carrying out a survey with users of the table to determine its tolerance to humid external conditions according to its use would probably cost the consumer more than buying the table. However, once it is bought, its owner can determine its resistance to climate conditions at a cost that will always be lower than the table itself.

Lastly, the attributes of merchandise whose acquisition costs before and after purchase are high constitute a credence product. Typically, with a table purchase, information concerning forestry practices (factoring in its role in climate change mitigation, biodiversity, etc.), wood transformation methods (construction of the table using wood of the same species but from different forests, working conditions, etc.) and distribution is very costly for consumers on their own to acquire or verify, before or after purchase.

The purpose of standards[1] is to offset this asymmetry of information about credence products by providing guaranteed information on the production chain of the goods or service. With a company wishing to offset part of its emissions, carbon offset guarantee the sequestration service provided by a forest, and attributable to forest management. Meanwhile, in the case of a purchase of a product made of wood, sustainable forest management labels certify compliance with social and environmental criteria in forest management and wood transformation.

This study proposes a typology for carbon offset and sustainable forest management standards, compares the attributes they certify, and explores possible synergies between these two types of certification.

1 *In this study, the term "standard" refers to carbon certification frameworks based on a group if rules governing the certification of the sequestration service.*
The terme "label" stands for the certification framework applied for the certification of sustainable forest management and sustainable wood production.

1. Recent certification frameworks deployed unequally throughout the world

A. History of the labels and links with legislation

1. The Rio summit (1992): a trigger event

Carbon offset and sustainable management standards emerged in the years following the 1992 Rio Earth Summit. After the summit, ministerial conferences on the protection of forests in Europe led to the adoption of a definition of sustainable forest management[2] (Signatory States and European Community, 1993) in Europe. During the Lisbon session (1998), sustainable forest management criteria and indicators (Signatory States, 1998) were defined. These targeted:

- The conservation and improvement of carbon sequestration in forests;
- The safeguarding of the health of forest stands;
- The maintenance of a balance between annual growth and timber extraction in production forests;
- The maintenance and enhancement of biological diversity, protection features (soils and water) and socio-economic services.

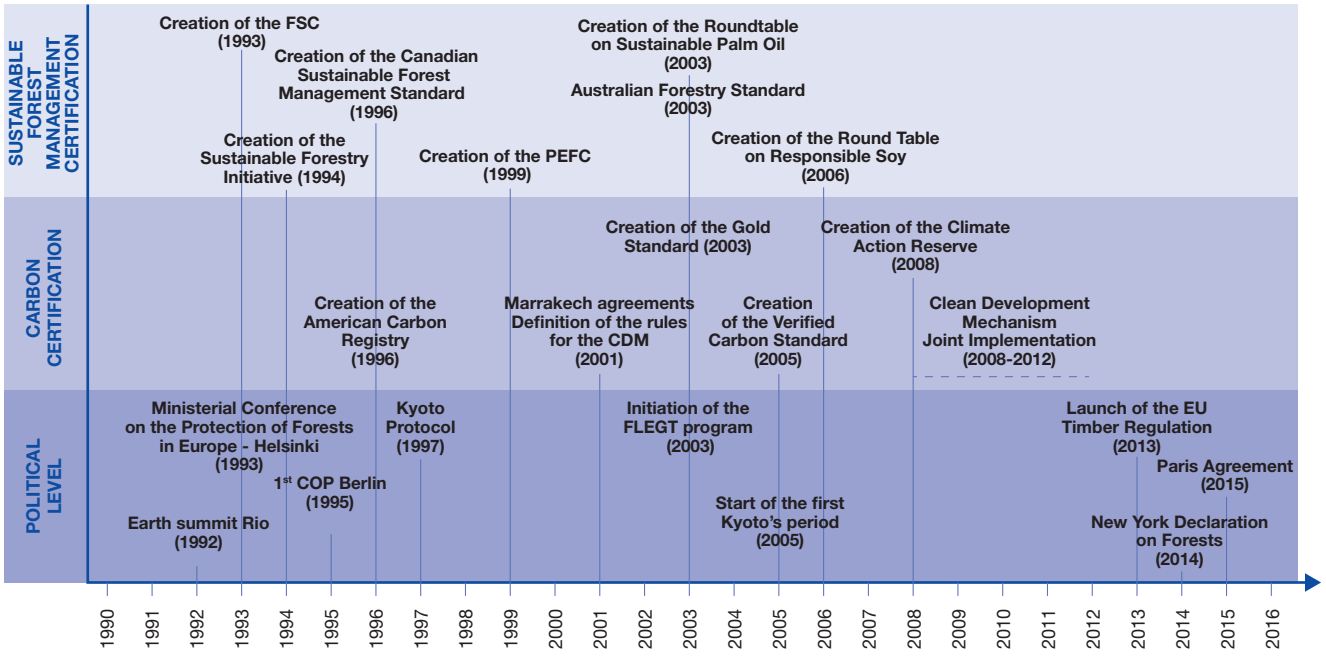
An updated version of this list of criteria was adopted in 2015 (Signatory States, 2015).

At the same time as these meetings and sometimes prior to them, sustainable forest management labels such as Forest Stewardship Council (FSC, 1993) and the Programme for the Endorsement of Forest Certification (PEFC, 1999) created standards laying down criteria similar to those defined during these conferences.

The first carbon offset standards went hand in hand with international climate negotiations, and only really took shape during the 2000s. While the Kyoto Protocol laid the foundations for the Clean Development Mechanism (CDM) in 1997, its specifications were only finalised at the Marrakesh COP in 2001. The CDM's principles and tools were largely adopted by carbon standards developed subsequently: VCS, Gold Standard, etc. (**Figure 2**). In a word, payments had to be oriented towards projects enabling additional, real, measurable emission reductions (United Nations, 1998).

2 http://forestEurope.org/ministerial-commitments/

FIGURE 2. CARBON OFFSET AND SUSTAINABLE MANAGEMENT CERTIFICATION FRAMEWORKS: CHRONOLOGICAL TIMELINE



Source : I4CE

2. Sustainable management in European legislation: a flexible concept

In the absence of a forestry policy decided at the European Union level,[3] each Member-State is responsible for the sustainable management of its forests.[4] Appendix 1 summarises France's national policies in this respect.

However, as the Union is empowered to negotiate commercial agreements with non-EU countries, the FLEGT regulation (Forest Law Enforcement Governance and Trade) aims to avoid the importation of wood obtained through illegal logging, by laying down sustainable management criteria for imported biomass.

In addition, again as regards solid biomass supplies, the European Union is working on the definition of sustainability criteria. To have renewable energy status, draft directive 2016/0382 COD (European Commission, 2017) requires the country of origin:

- to have legislation and monitoring systems guaranteeing sustainable management;
- to fulfil certain specific conditions, such as ratification of the Paris Agreement, the submission of an NDC (Nationally Determined Contribution) covering the LULUCF (Land Use, Land Use Change, and Forestry) sector or to have a system for monitoring land use emissions and absorptions.

3. Forest carbon projects: no European framework but national initiatives

The EU legislates on carbon offsets saleable in the European carbon market (EU Emissions Trading Scheme): only UN standards (CDM and JI) are recognised, and forestry projects are not eligible.

However, several countries are developing national carbon standards for forestry projects. This is the case with the Woodland Carbon Code, supported by the Forestry Commission in the UK, and the Label Bas Carbone (low carbon standard) supported by the MTES (Ministry for an Ecological and Inclusive Transition) in France.

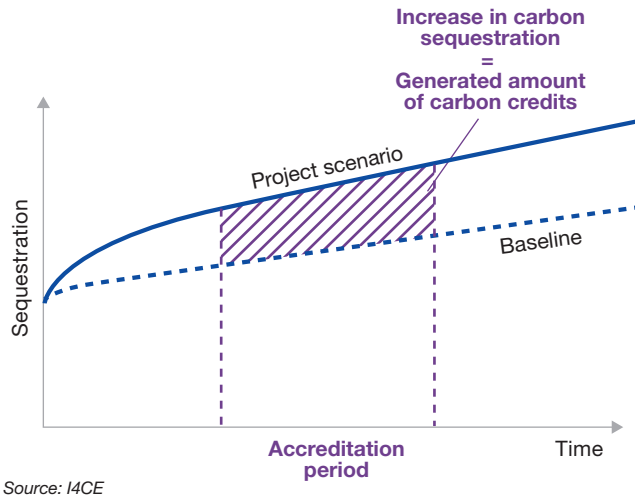
B. Purpose of labels and definitions

1. Sequestration service or sustainable wood production

a. Carbon standards: certification for an enhanced sequestration service

The emission reductions and sequestration allowed by a carbon project correspond to the difference between greenhouse gas (GHG) emissions during the project period and emissions in the absence of a project following a reference scenario **(Figure 3)**. Carbon offsets materialise the certified sequestration service assessed in this way.

FIGURE 3. PRINCIPLES OF A CARBON OFFSET PROJECT



Source: I4CE

b. Sustainable management labels: certification of a product's production method: wood

Forests certified for their sustainable management meet requirements concerning the conservation and improvement of ecosystem services provided by the plot, in compliance with the rights of communities and labour rights.[5] This certification appears on harvested wood products, which requires considerable work on traceability.

2. ISO definition of a label

According to the International Organization for Standardization, or ISO, certification is "a procedure by which a third party gives written assurance that a product, process or service is in conformity with certain standards".[6]

The two types of certification certainly meet this definition: with the first case, a service for reducing GHG emissions is certified; the second is a guarantee of sustainability and quality of a product's production.

Certification of the sustainability of commodities whose production involves a major deforestation risk imply specific labels. Apart from wood, these certification systems concern the following agricultural commodities: palm oil, soy and beef, which, with wood production, are the main drivers of deforestation in developing countries (Bourgau et al., 2007) and (Hosonuma et al., 2012). For this study, the

3 http://ec.europa.eu/environment/forests/index_en.htm

4 https://ec.europa.eu/growth/sectors/raw-materials/industries/forest-based/sustainable-forest-management_fr

5 https://www.pefc.org/standards/sustainable-forest-management/requirements-criteria *and* https://ic.fsc.org/en/what-is-fsc-certification/principles-criteria/fscs-10-principles

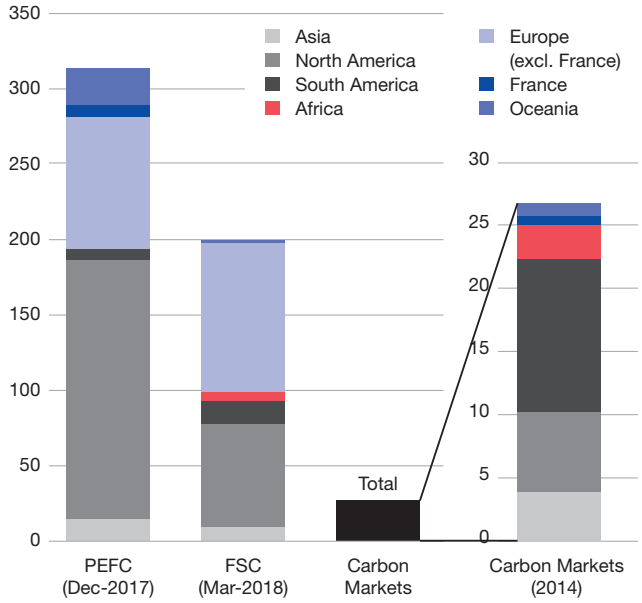
6 https://www.iso.org/fr/certification.html

focus is on the FSC, PEFC, Gold Standard and VCS labels. Other certification schemes are occasionally mentioned for comparison. A list and descriptions of these labels is provided in Appendix 2.

C. Current state of markets: location of certified plots and areas concerned

The FSC and PEFC largely dominate the certification of sustainable forest management (Food and Agriculture Organisation of the UN, 2015). 85% of areas certified by these labels are located in Europe and North America. **(Figure 4**). As regards carbon offsetting, the situation is more fragmented: in addition to the historical reference of the CDM, seven standards have market share of over 1% (VCS, Climate Action Reserve, Gold Standard, etc.) (Goldstein, 2016). The label most used is VCS, with 60% of carbon offets retired in 2016. South America hosts most projects, with 45% of certified areas, followed by Africa and Asia, together accounting for 24% of certified areas.

FIGURE 4. LOCATION AND SURFACE AREAS OF CERTIFIED PLOTS (IN MILLIONS OF HA)



Note: *As regards carbon certification standards, the data presented below correspond to those of Ecosystem Marketplace, and concern 32 MT CO2e traded on the carbon markets. The surface areas correspond to those communicated to Ecosystem Marketplace by projects in 2012, 2013 and 2014.*

Source: I4CE according to the PEFC & FSC sites and Ecosystem Marketplace (2015), State of Forest Carbon Finance

The importance of REDD+[7] projects explains the large proportion of tropical continents.

Between 2000 and 2014, the area certified by FSC and PEFC was multiplied by 33, and grew constantly over the period (MacDicken et al., 2015). The PEFC-certified area is 36% larger than the area with FSC certification, despite the earlier creation of FSC. This can be explained by different operating methods regarding the approval of national versions. In both cases, general criteria on an international scale were laid down for national standards, serving as a basis for certification in the field.

However, the PEFC sometimes functions in a "bottom-up" manner by recognising specifications drawn up by pre-existing national labels. This is what happened with Malaysian, Indonesian and American certification schemes (SFI). However, the integration of these schemes by the PEFC required profound alterations in these certification systems. To date, the label has recognised 39 certification systems.8 Each national scheme has to comply with the meta-standards of PEFC international (PEFC, 2010).

The FSC approach is more "top-down": there are "principles and criteria" decided on an international scale. These take the form of indicators, adapted to the national scale, when national forest management standards are drafted. For countries with no national standards, generic international indicators can be used as a reference basis.

7 *Reduction of Emissions from Deforestation and Forest Degradation projects, where the "+" refers to the inclusion of increased carbon stocks, for example through adapted forestry practices or plantations.*

8 https://www.pefc.org/about-pefc/who-we-are

2. Similarities in stakeholders and procedures; divergences in objectives

A. Certification principles and eligible practices

1. Different approaches to certification

While sustainable management certification schemes and carbon standards both serve as a support for ecosystem service payments – the implementation of a management system enabling the maintenance and enhancement of forestry amenities – they are nonetheless based on different approaches.

a. Sustainable management certification rewards virtuous practices

Sustainable management certification corresponds to compliance with specifications defined by the label. With this system, it is possible for managers not to alter their practices in order to receive the label. The advantages linked with certification (image, premium on the product, etc.) rewards virtuous practices whether or not these have been especially implemented to obtain certification.

b. Carbon certification rewards improved practices

Carbon certification depends on proof of the project's additionality. This demonstration is generally based on a series of tests proving that, without the income produced by the sale of carbon offsets, the project could not have taken place (see details in Appendix 3). As indicated by Karsenty et al., 2017we explain two 'regimes of justification', efficiency on the one hand and social equity on the other, and discuss how analysts position themselves with regard to both regimes. For the legal dimension, we review and analyse specific cases in which PES are implemented in addition to existing environmental regulations. We propose a renewed framework of analysis to distinguish 'compensation' and 'reward' in PES by crossing the opportunity cost dimension and the legal constraint vis-à-vis the environment. We show how difficult it is to fully maintain the objective of efficiency when PES are implemented simultaneously across different combinations of opportunity costs and regulation constraints. We propose policy options to address the contradiction between incentive and coercive instruments. These options are land sparing, social targeting and chronological combinations. The idea is to prevent sequestration service payments from "rewarding agents for something they do already, and that they would continue to do even without payment" and thus limit the "deadweight" effect. This is a major difference from sustainable management certification, which does not include this idea of additionality.

c. Quantification of the additional sequestration service vs. implementation of sustainable practices

Sustainable management certification provides a framework for management practices and consists in achieving a certain level of sustainability, while carbon offsetting standards impose an obligation to measure and improve the carbon footprint of forest management practices. This obligation to improve on the initial situation is not always required for sustainable management certification (which depends on the type of forestry originally implemented).

This is another fundamental difference with carbon projects. In these projects, the volume of GHG emission reduction achieved regarding the reference scenario will determine the number of carbon credits allocated to the project. Payment thus depends directly on the impact of the service provided, i.e. the number of metric tons of CO_2 avoided or sequestered. The result in terms of the project's carbon footprint is essential, and determines the project's economic success for the forest manager.

2. Similar Forest Management Practices often implemented

a. Improved forest management plans compatible with both certifications

Numerous practices – restoration of degraded forest land, risk management, etc. – are recommended (sustainable management) or imposed (in specific carbon offset methodologies) by both certifications (**Table 1**).

This reconciliation of practices targeted by the two types of certification is explained in particular by:

- The integration of the carbon criterion in sustainable management labels, which also require requiring the maintenance or improvement of the carbon sequestration capacity of forest stands (Signatory States, 1998);
- And the recognition by certain carbon standards of principles laid down in the sustainable management certification labels. For example, the Gold Standard, in the case of forestry projects, leaves the project owner to decide between carrying out a Do-No-Harm Assessment[9] or an FSC certificate to demonstrate a project's environmental integrity (excluding carbon) and social integrity (**Gold Standard, 2013**).

However, this list of similar practises does not mean that all these practices are eligible for the two types of label: depending on the contexts, the detailed certification

9 *A "Do-No-Harm" assessment is an evaluation performed before the implementation of the project activities in order to ensure that the project contributes to sustainable development and does no harm to any component of the sustainable development.*

TABLE 1. ELIGIBLE PRACTICES RECOMMENDED BY BOTH SUSTAINABLE MANAGEMENT CERTIFICATION SYSTEMS AND CARBON STANDARDS

Practices eligible for certification	Standards/methodologies developed by sustainable management certification frameworks (non-exhaustive)	Standards/methodologies developed by carbon standards (non-exhaustive)
Restoration of degraded wooded land	• **FSC - Principles and criteria:** Restoration of areas of "native" forests when the proportion of such forests in the manager's plot is considered too low • **PEFC - Rules governing sustainable forest management:** rehabilitation of degraded forest ecosystems encouraged.	• **ACR:** Restoration of Degraded Wetlands of the Mississippi Delta • **CDM:** Afforestation and reforestation of degraded mangrove habitats (large-scale) • **ACR:** Afforestation and Reforestation of Degraded Lands 1.1
Improved productivity of forest stands	• **FSC - Principles and criteria:** harvest levels should take the forest's productivity into account. • **PEFC - Rules governing sustainable forest management:** ensure maintenance of the quantity and quality of forest resources in the medium- and long-term.	• **VCS:** Methodology for Conversion of Low-productive Forest to High-productive Forest, v1.2
Risk management (e.g. forest fires)	• **FSC - Principles and criteria:** the manager must assess the risks and introduce risk mitigation activities according to risk intensity and the scale and nature of action. • **PEFC - Rules governing sustainable forest management:** apply appropriate measures in sensitive zones […] at risk from fire (e.g. clearing, pruning, water points, etc.).	• **ERF**: Savanna fire management • **VCS**: AFOLU Non-Permanence Risk Tool
Improved management in the broadest sense and extension of rotation periods	• **FSC - Principles and criteria:** the management should extract the resource at a level equal to or lower than what can be supported by the ecosystem • **PEFC - Rules governing sustainable forest management:** the exploitation levels of products, ligneous and non-ligneous, must not exceed a rate that can be maintained in the long-term, and optimum use should be made of the forestry products exploited, taking due account of the extraction of nutrients	• **VCS:** Performance Method for Reduced Impact Logging in East and North Kalimantan v1.0 • **VCS:** Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.2 • **VCS:** Reduced Impact Logging Practices that Reduce Carbon Emissions (RIL-C) Methodology • **VCS:** Methodology for Improved Forest Management through Extension of Rotation Age, v1.2

Source: I4CE starting from (FSC, 2016a; PEFC, 2017); (PEFC, 2010a)

requirement (especially additionality for carbon offset) are not always fulfilled.

Meanwhile, the practices targeted by certification for the production of sustainable commodities and REDD+ projects are analysed in Appendix 4.

b. Two strategies for identifying sustainable practices: top-down and bottom-up

We have seen the difference between the FSC's "top-down" approach and the PEFC's "bottom-up" approach in terms of sustainability requirements (which does not hold for chain control certification, where regulations are almost identical all over the world). Carbon offset standards also differ from each other. Most of them foster a bottom-up approach: they issue guidelines, but leave it up to the project owners to propose compliant monitoring methods. However, some standards like the Climate Action Reserve take charge of drafting methods themselves. Lastly, most standards, like the CDM, incorporate methods and monitoring tools gradually as they receive new method proposals.

B. Similar stakeholders who often share the same goals

1. The State: a key protagonist in certification systems

By adopting major guidelines on the importance of managing forests sustainably, the State can play an essential role in promoting better forest management.[10] This support for sustainable management is also expressed through its contribution to the drafting and application of forestry legislation.[11]

The public authority can also promote sustainable management through its tenders for projects using wood. Indeed, the social and environmental clauses of the public procurement code authorises the introduction of

10 For example, in 2016, France introduced a National Wood and Forest Programme highlighting the need to manage forests sustainably.

11 In France, the Forestry Code requires owners of forests of over 25 ha to manage them sustainably (within the meaning of the Forestry Code).

environmental requirements based notably on the eco-labels awarded by independent bodies (*Social and environmental clauses of the public procurement code*, n.d.).

States also play an important role in voluntary carbon certification schemes (see the above mentioned British and French examples) and can sometimes measure progress sustainable management implementation on a national scale (Appendix 5).

2. NGOs: driving forces in label construction

NGOs take an active part in the creation of labels, mainly through the drafting and revision of standards (participation in boards of directors and technical committees). The WWF perfectly illustrates this involvement **(Table 2)**.

3. Independent third parties are essential for ensuring the credibility of certification mechanisms

Verification of compliance with the label's rules is generally carried out by an independent third party. It is the label's responsibility to appoint accredited auditors[12] (or to delegate this role). The entities accredited are mostly legal entities – audit firms – but some labels credit individuals, or, like the VCS, a combination of the two: a legal entity accredited for the verification of projects, and an individual accredited for the validation of methodologies or the assessment of the risk of non-permanence. These auditors usually have to receive training from the certification body.

One option consists in recognising the qualification of auditors regarding the certification systems for which they are already accredited. This is the case with the VCS, which recognises auditors accredited by the UNFCCC.

4. Labels enable users' virtuous practices to be highlighted

a. Project owners: an economic and visibility-enhancing goal

In an analysis by the WWF of the costs and benefits for forestry companies in joining the FSC certification scheme (WWF, 2015), the advantages for these companies are linked to the hope of higher income through a premium on the wood sold, and a facilitated access to certain markets. However, beyond the direct economic and commercial aspects, one of the most important advantages of certification lies in the improved image of the forestry/transformation company.

With carbon certification, revenue arising from the sale of carbon credits is the main attraction for project owners (Didelot, 2017; Hamrick and Gallant, 2017).

In addition, particularly in the case of sustainable management certification, obtaining certification gives producers greater access to different markets. This is the case with various private markets. For example, the IKEA company set a 100% objective for the use of FSC certified wood by 2020 (compared with 61% of certified wood used in early 2017).[13] Companies' commitments in terms of deforestation are shown in Appendix 6.

TABLE 2. THE WWF'S ROLE IN THE CONCEPTION AND CREATION OF VARIOUS SUSTAINABLE AND CARBON CERTIFICATION FRAMEWORKS

Label name	Founding member	Member of the Board	Other role
Gold Standard	yes	no	Group of supporting NGOs
Forest Stewardship Council	yes	no (not at present)	Participation in working groups for drafting standards
Roundtable on Sustainable Palm Oil	yes	yes	-
Roundtable on Responsible Soy	yes	yes	-
Sustainable Beef Roundtable	no	no	Facilitator and stakeholder
Round Table on Sustainable Biofuels	no	no	Member of the working group on the environment

Source: I4CE from (WWF, 2010) and the Gold Standard website

12 *Example of the list of certifying bodies accredited by the FSC:* http://www.accreditation-services.com/archives/standards/fsc

13 http://www.ikea.com/ms/fr_FR/media/Newsroom/Communiques-presse/IKEA_BOIS_GESTIONDURABLE.pdf

5. End consumers are both unevenly informed and willing to pay

One motivation for wood transformation businesses buying raw materials from certified forests under sustainable management, lies in the hope of selling the transformed wood product at a higher price (see **section 2.D.2.** on premiums).

However, this incentive created by the consumer via potentially higher prices for certified sustainable products should be tempered according to the degree of consumers' knowledge about these labels. A study carried out by FSC revealed that in France, only 18% of consumers were very familiar with the FSC label, compared with 49% who had little or no knowledge of it (FSC, 2015a). With PEFC, 22% of consumers knew of the label in a sample of 1,000 people of various nationalities (France, Germany, Brazil, etc.)[14].

With carbon offset, end consumers were mainly companies seeking to position themselves as environmental leaders and communication on carbon neutrality. The price of the carbon offsets purchased by these companies is highly variable (Goldstein, 2016; Tronquet et al., 2017).

Citizens can also play a role in promoting forest management that enables increased carbon sequestration by forest stands. Therefore some labels like Carbonfree of the CarbonFund[15] certify the carbon neutrality of a product or service. By buying such products, consumers indirectly finance offset projects (including forest carbon projects). The same logic can apply to events: during the Salt Lake City Olympic Games (2002), sponsor companies supplied a fund to offset emissions from the event, the scheme being certified "Climate Cool" by the Climate Neutral Network (Bellassen and Leguet, 2007).

C. Monitoring, Reporting and Verification (MRV): which indicators?

1. Stages in certification

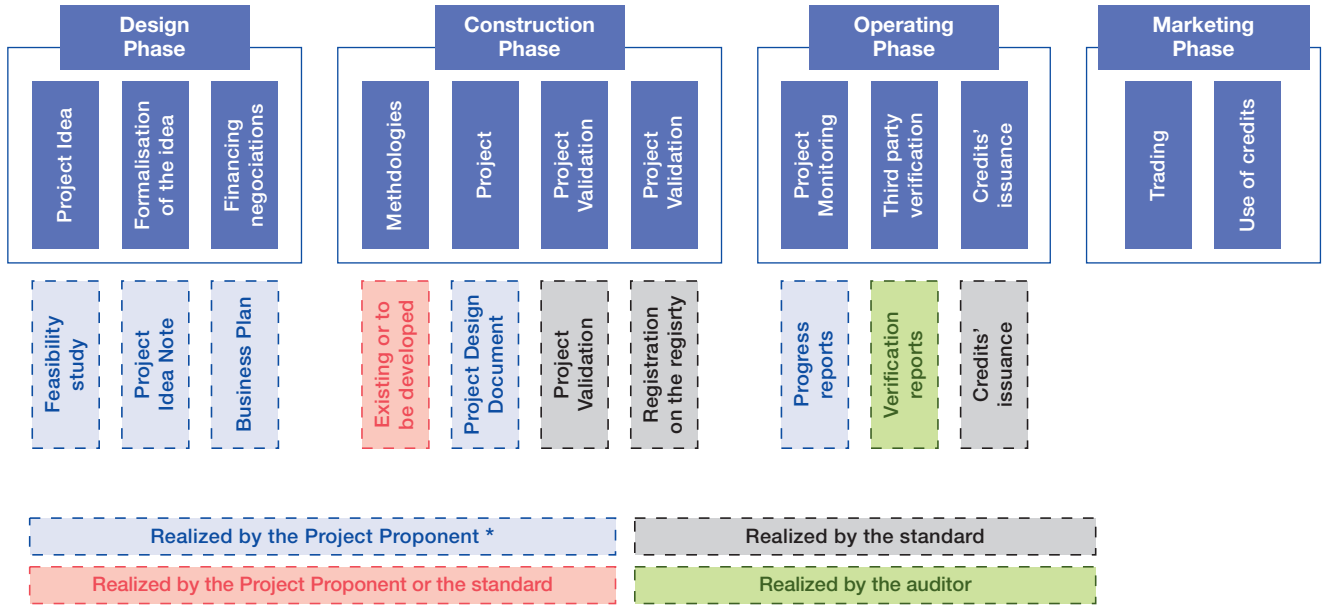
With carbon certification, the implementation of a forest carbon project, from its inception to the income received from the sale of the first carbon credits, can take several years. Starting from the identification of a project opportunity, its technical and financial assessment and its formalisation, the carbon certification process imposes a certain number of constraints before the project can actually issue carbon offsets. **Figure 5** presents the different life stages of a Clean Development Mechanism (CDM) project.[16]

14 https://fr.scribd.com/document/248545033/Global-Consumer-Survey#download&from_embed

15 https://carbonfund.org/product-certification/

16 *The project cycle is often the same for JI and voluntary projects.*

FIGURE 5. LIFE-CYCLE OF CDM PROJECTS



** Project owner: Forest manager/cooperative/Forest owners group association/local authorities/State*

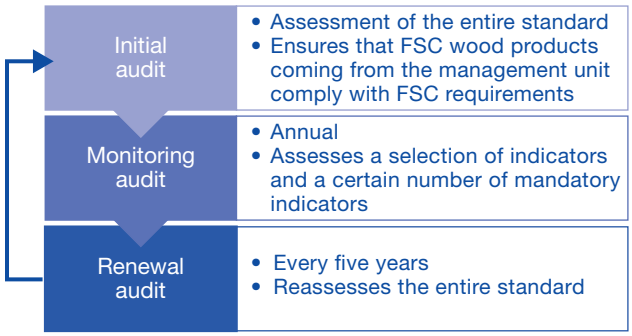
Source: I4CE

The independent auditor intervenes in the certification mechanism to check the project's compliance with specifications. He therefore conducts one or several verifications of the emission reductions achieved by the project to ensure the conformity of progress reports.

With the FSC label, the forest manager is audited by an independent third party before even contacting the label. If the silviculture of the applicant manager meets all the standard's requirements, the certifying body will award a certificate valid for five years after the FSC has received and validated the audit report. The manager must then undergo annual follow-up audits, when a minimum number of the standard's requirements are assessed. Lastly, every five years, a renewal audit reassesses the management unit regarding all the standard's requirements (**Figure 6**). These audits are financed by the certificate holder.

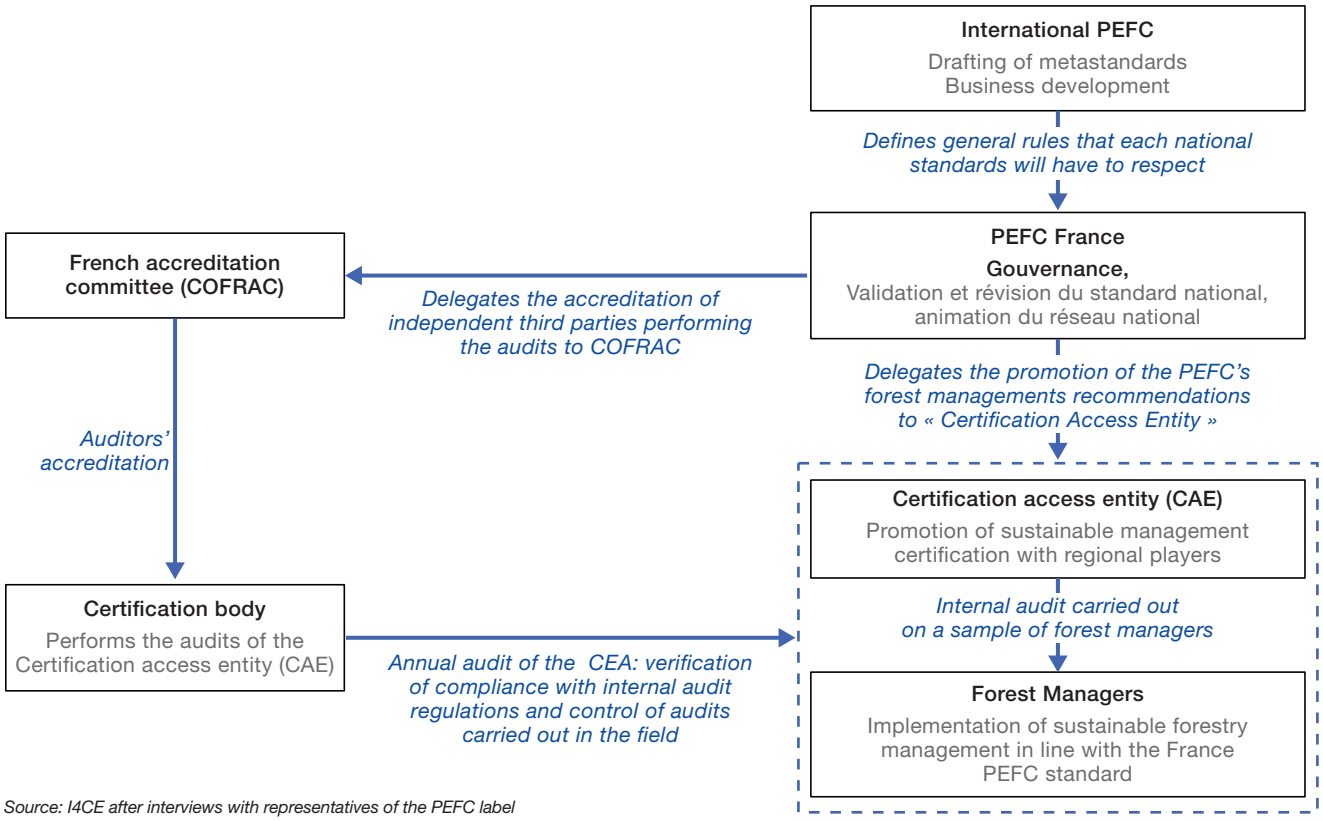
PEFC certification (in France) for sustainable forest management provides an opportunity for group certification. In this context, a "Certification access entity" (CEA) bringing together a group of managers is formed. This entity monitors the entire group's compliance with PEFC certification by controlling a sample of 10% of its members. At the same time, the entity is itself audited by an independent third party (**Figure 7**).

FIGURE 6. PROCESS FOR VERIFYING COMPLIANCE WITH SPECIFICATIONS BY INDEPENDENT AUDITORS FOR FSC CERTIFICATION SOURCE (FSC, 2017A)



Source: FSC, 2017a

FIGURE 7. MECHANISM FOR GROUP CERTIFICATION WITH PEFC (EXAMPLE IN FRANCE)



Source: I4CE after interviews with representatives of the PEFC label

Some of these independent third parties are empowered to carry out audits for both sustainable forest management and carbon certification.[17]

The period of validity of the certification is similar with both types of certification schemes. In the case of sustainable management, the certificate is valid for 3 years (PEFC) to 5 years (FSC), and with both systems they are subject to validation by annual audits. With forest carbon projects, it is barely longer: 7 years (renewable) with the CDM, and 5 years with the Gold Standard. However, verifications that sanction ex-post results are quite comparable (at **least** one every 5 years with the Gold Standard[18]).

2. Control of requirements and indicators

a. Sustainable development requirements considered by certification labels

According to Sustainable Map, the FSC and PEFC sustainable management certifications incorporate even more requirements than carbon standards or sustainable commodity production certification (**Figure 8**). However, the analysis does not indicate the degree of precision or stringency for each indicator, only if they are considered. This result is coherent with the purpose of each type of standard as carbon standards tend to focus mainly on carbon, even if the Gold Standard – not studied by Sustainable Map – or the VCS in addition to the CCBS certification would probably have had better results regarding sustainable development criteria.

If we focus on the carbon criterion, we observe, with no surprise, that the VCS incorporates more requirements than the four others, with 80% of the sub-criteria included, compared with 40% with the RSPO, 33% with the FSC, 27% with the PEFC and 29% with the RTRS. This is because, if we take closer look, the FSC for example, requires no estimation of the carbon footprint, no demonstration of additionality, no assessment of the risk of non-permanence, etc. (**Table 3**).

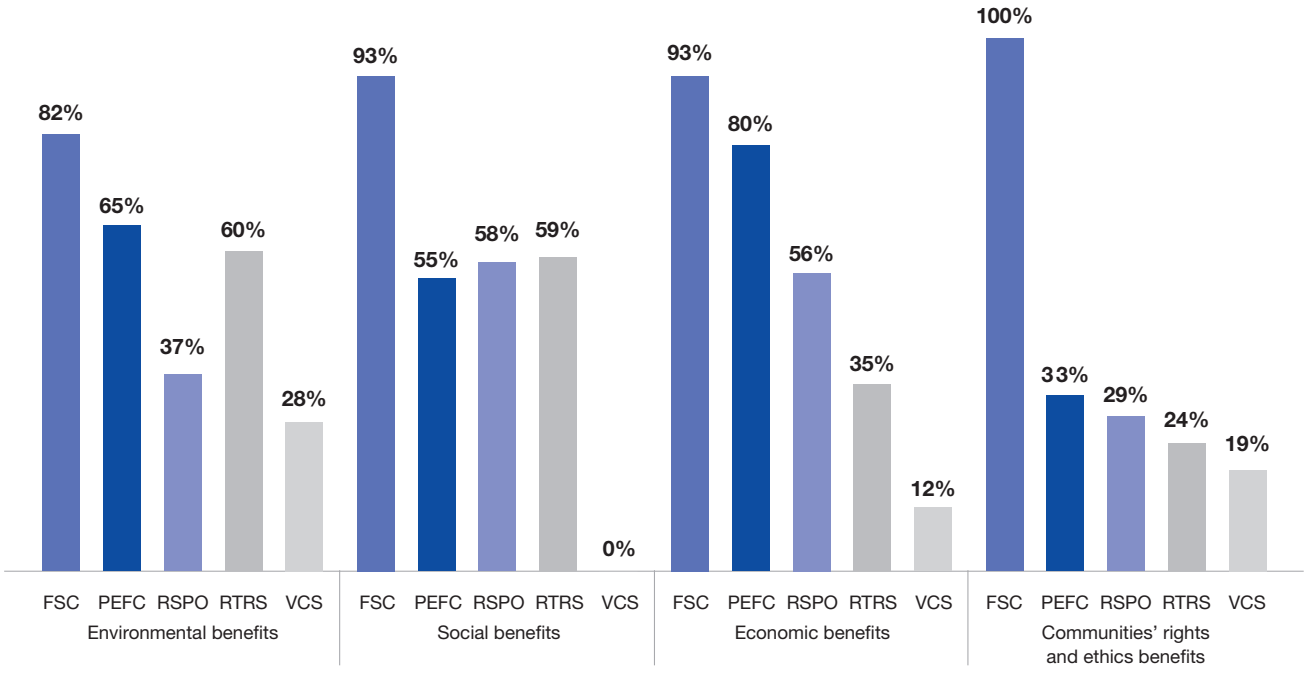
Futhermore, some sustainable production roundtables now integrate the carbon criterion, like the RSPO, which has developed a *PalmGHG Calculator*. The aim of this tool is to enable palm oil producers to identify the main sources for mitigating emissions in their production chains.

Among other indicators, the calculator incorporates the

17 As is the case, for example, with Ecocert, authorised both to carry out VCS carbon project audits and to control PEFC specifications.

18 https://www.goldstandard.org/globalgoals

FIGURE 8. PROPORTION OF CRITERIA OF THE SUSTAINABILITY MAP INITIATIVE CONSIDERED BY THE DIFFERENT LABELS ASSESSED



Source: Sustainability Map (http://www.standardsmap.org/: site visit from Octobre 2017).

carbon sequestration enabled by the biomass, land use changes, emissions linked with the transport of inputs and N2O emissions due to the application of fertiliser. An assessment using default values is possible: 10 previous land uses have been defined, and the sequestration per hectare enabled by these uses[19] is entered into the calculator (RSPO, 2012).

19 As an example, it is indicated that a primary forest sequesters 225 TC/ha, i.e. approximately five times more than palm oil plantations (around 50 TC/ha).

TABLE 3. THE CARBON CRITERIA WITHIN THE VCS, FSC AND PEFC FRAMEWORKS

	Verified Carbon Standard	Forest Stewardship Council	Programme for the Endorsement of Forest Certification schemes
Label's carbon policy: general principles	The label requires its users to carry out the following stages in order to ensure the veracity of information on GHG emission reductions linked with the performance of a project: 1. Measurement of GHG emission reductions enabled by a project, 2. Exhaustive information on a project's emissions and absorption, 3. Consistency of information collected enabling a comparison, 4. Accuracy: maximum reduction of biases and uncertainties, 5. Transparency, 6. Conservative nature of the data supplied.	In terms of products and services, the FSC Principles and Criteria cover the production of wood and non-wood products. Certification concerns forestry products, conservation, protection, ecosystem services and other uses. Ecosystem services include carbon sequestration and storage contributing to the mitigation of climate change.	The requirements set by PEFC on an international level make the first criterion for sustainable forest management the maintenance and improvement of the forestry resource and its contribution to the fight against climate change, which involves the non-conversion of forest land for other uses.
Criteria for monitoring GHG emissions	The project owner must establish a system of information on GHGs in order to obtain, record, analyse and assess GHG emissions. The data analysis makes it possible to quantify and declare GHG emission reductions and/or absorptions relevant for the project (including leakages) and the reference scenario. A monitoring plan is drafted and implemented. A progress report is drafted based on the documents provided by the VCS.	A recommendation for monitoring this indicator is formulated. The manager monitors and assesses the environmental and social impacts of activities carried out in the management unit, and changes in its environmental state.	The monitoring of this indicator is not specifically targeted. However, periodic monitoring of the management implemented is required, which provides an indirect indication of the level of sequestration enabled by the management unit.
Requirements related to possible alternative solutions for reducing GHG emissions	Yes – the methodologies and tools provided or recognized by the VCS determine how scenarios other than the project scenario can be defined. This exercise enables to define the most credible reference scenario, which will then make it possible to quantify the carbon gains permitted by the project.	None	None

TABLE 3. THE CARBON CRITERIA WITHIN THE VCS, FSC AND PEFC FRAMEWORKS *(continued)*

	Verified Carbon Standard	Forest Stewardship Council	Programme for the Endorsement of Forest Certification schemes
Requirements relating to the quantification of GHG emission reductions	GHG emissions and/or absorptions must be estimated for each GHG source, sink and/or reservoir relevant for the project (including leakages) and the reference scenario. Net GHG emission reductions and absorptions generated by the project must be quantified.	None	None
Carbon sequestration in soils or biomass	Projects concerning afforestation/ reforestation, improved forest management, deforestation avoided and restoration of wetlands can be certified by VCS. The sinks (particularly the soil) to be considered differs from one methodology to another. The VCS uses the method known as the «long-term average storage»: the maximum offset cap that can be issued by the project correspond to the difference between the two long-term sequestration averages between the project scenario and the reference.	The forest manager identifies and implements effective measures to prevent the negative impacts of management activities on environmental values, and to mitigate and improve those that are produced, according to the scope, intensity and risk of these impacts. According to the FSC's definition, environmental risks include the sequestration and storage of carbon.	Appropriate silviculture must be introduced to achieve and maintain «socially, ecologically and economically desirable» forest carbon stocks.
Permanence of reduced emissions and renewal of sequestration at the end of the project	In the case of afforestation/ reforestation projects with harvesting, the length of the project can include activities that ensure the renewal of carbon stocks over time, either by pursuing activities relating to the project activity, or by replanting trees or reforesting after the project's last planned harvest. Such a commitment from the owner can be demonstrated by the presentation of PEFC and FSC sustainable management certification. Management of the risk of non-permanence is carried out by sharing the risks between the project owners via a credit buffer.	After harvesting and in line with the management plan, managers must allow their plots to return to a forested condition by natural means or artificial reforestation.	The renewal of the forested condition through natural regeneration or artificial seeding is required.
Considerations regarding the adaptation of species	Not directly, but the success of the project depends on it.	The forest officer manages its plot in order to maintain and/or restore a varied range of species, sizes, ages, spatial scales and regeneration cycles adapted to the species requirements. This approach is designed to boost the management unit's environmental and economic resilience (defined as the ability to resist or adapt to changes).	PEFC asks managers to refer to the guides for the selection of acclimatised species suitable for the local climate and soil situation. The French version of requirements specifies that the introduction of new species in a limited area (5 ha) is authorised in the case of an experimentation for climate change adaptation.

TABLE 3. THE CARBON CRITERIA WITHIN THE VCS, FSC AND PEFC FRAMEWORKS *(continued)*

	Verified Carbon Standard	Forest Stewardship Council	Programme for the Endorsement of Forest Certification schemes
Sustainability of forest management	Not directly.	The manager harvests the wood at a sustainable level (a level equal to or lower than the one that can be sustained permanently).	The manager must adopt a silviculture that minimises potentially negative impacts on the forest itself and also on the soil and water resources.
Inclusion of risk of leakages	An assessment of this risk of carbon leakages s must be carried out.	No	No
Additionality	The additionality of the initial project's activities must be demonstrated for each of the project's geographical zones, in compliance with the methodology employed.	Not applicable	Not applicable
Transparency / register	Registry listing carbon offsets.	Existence of a portal listing all the certificate holders and areas concerned.	Existence of a portal listing all the certificate holders and areas concerned.

Sources: (VCS, 2017), (VCS, 2013), (VCS, 2016), (FSC, 2015b), (PEFC, 2010), (PEFC, 2016), websites of FSC, PEFC and VCS.

b. Certifying the control chain

The issue of traceability in these certification mechanisms is important. Labels for the sustainability of commodities have thus drafted standards for certifying transport/transformation chains.

With the PEFC, the requirements (PEFC, 2015) include:

- A series of procedures to be complied with: product marking, the maintenance of production records, internal non-conformity control procedures, control of the origin of the raw material acquired.
- Compliance with social and hygiene conditions, notably workers' rights.

FSC uses a control procedure very similar to the one carried out by PEFC.

In the case of carbon certification, the traceability of carbon offsets is ensured by holding a registry.

Appendix 7 presents the special case of RSPO certification.

3. A penalty necessarily limited in the event of non-compliance

If minor infringements are noted by the auditors, no label applies any penalties if managers correct their practices in the following years. For more major infringements and fraud, the maximum penalty is withdrawal of certification. With carbon offset, a project that is not fraudulent but less effective than planned will also be penalised by construction by receiving a smaller quantity of credits than planned. In all cases, as these labels are private, their repressive effects are necessarily limited. In addition, they cannot induce the fear of a fine or other penalties, although loss of certification can have other consequences (in terms of image, for example).

D. Certification: costs and incentives

1. Overview of the costs of each certification system

a. Certification costs involved in the certification of sustainable management

The FSC has classified the costs for forest managers (**Figure 9**). This classification distinguishes between the costs involved in the certification process (direct costs) and those of the labour required for the management unit to be eligible for certification (indirect costs).

This document also includes several examples of the direct external certification costs depending on the forest plots under consideration (**Table 4**). The figures shown include the costs of paying the external auditor for the initial audit and the four annual audits mentioned above as part of the FSC certification procedure.

The costs of internal audits, preparation for the external audit and taking corrective action to meet the FSC's specifications involve equivalent sums (Forest Stewardship Council, 2011).

Beyond the cost of the external certification organisation accredited by the ASI, there are administrative fees received by the FSC (FSC, 2016b), mainly to cover the costs of development of FSC tools (standards), advertising, brand protection, communication and the regional offices. The amount of these fees, payable by the forest manager each year, depends on the size of the plot (from $0/ha for small plots to $0.02/ha for plantation forests).

As for PEFC France, the annual contribution paid depends on the organisation's turnover, and ranges from €200/year for organisations with a T/O of under €500 k to around €5,500/year for organisations with a turnover of over €62.5 M. Forest managers may also apply for individual certification, in which case they pay for the annual audit conducted by an independent third party.

With both certification frameworks, the cost of the audit performed by the independent organisation accredited for certification on the control chain depends on each certifying body.

b. Certification costs for carbon offsetting

Deheza et al. (2015)[20] have reported the following certification costs, based on an analysis of three projects[21] conducted by the VCS and the Clean Development Mechanism:

- €5,500 for the costs of developing the project and validating the project document (for a validity period of 10 years);
- €3,000 per verification (with a frequency of verification by auditors of once every 5 years).

2. The incentive: sale of carbon credits or a premium on the sale of wood products

a. Economic incentives in both cases

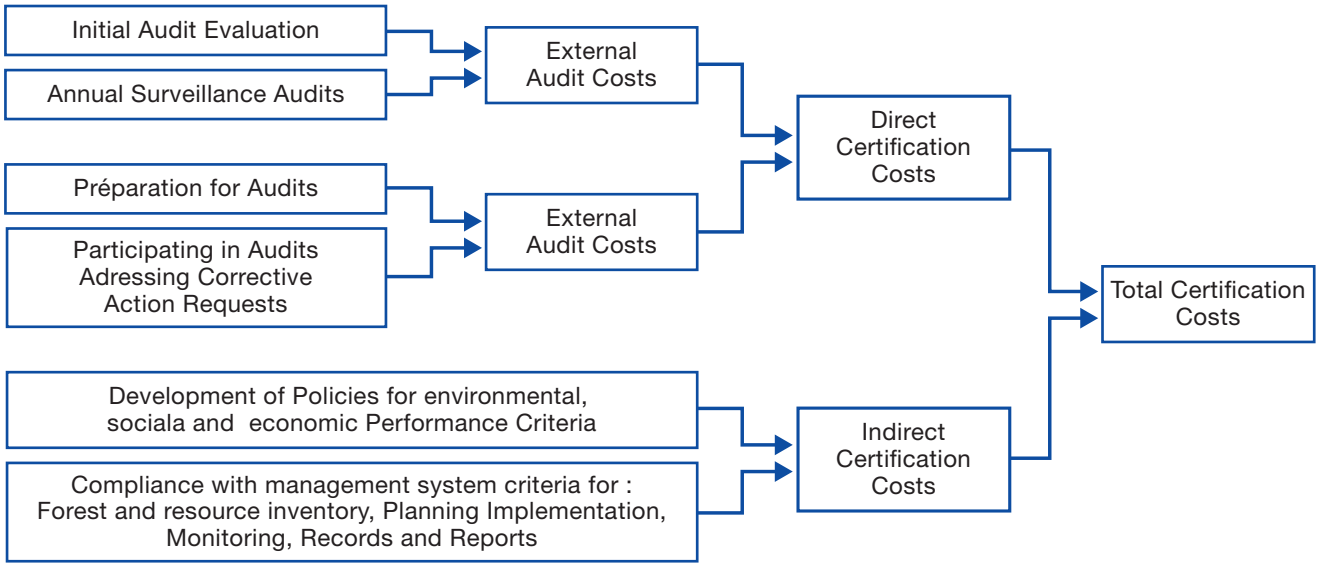
A report from WWF (WWF, 2015) citing Espach (2006) and Nebel et al. (2005) estimates a rise in sale prices ranging from 5% to 51% for FSC-certified wood from Brazil and Bolivia, moderating these conclusions with the indication that other studies contradict these results. A similar study focusing on wood from forests in Malaysia estimates a significant rise in prices from 2% to 56%.

With regard to carbon finance, the incentive arises essentially from the revenue generated by the sale of carbon credits. For example, Ecosystem Marketplace reports an average global price of $5.1/tCO$_2$e in 2016 (Hamrick et al., 2017). In France, the average price was €4.2/tCO$_2$e in 2015, all sectors included (Tronquet et al., 2017). A such incentive, in the case of a large plantation project, would bring €541/ha to the project for the first sixty years (according to sequestration data provided by CNPF).

20 *Bellassen et al. (2015), "Accounting for Carbon - Monitoring, Reporting and Verifying Emissions in the Climate Economy".*

21 *Projects of more than a thousand hectares.*

FIGURE 9. PLAN OF THE COSTS FOR CERTIFICATION OF SUSTAINABLE MANAGEMENT



Source: Forest Stewardship Council, 2011

TABLE 4. DIRECT CERTIFICATION COSTS FOR FSC CERTIFICATION

Total area considered	Number of owners concerned	Details	Direct FSC certification costs over a 5-year period (in $)	Cost of certification per forest owner ($/forest company)
Approx. 1,000 ha	1	Costs for a 5 years certification. Costs depend on the area and intensity of forest management.	10,000	10,000
2,000 to 20,000 ha	100	Costs for a 5 years certification. In many cases, the costs cannot be assumed by a single owner, hence the option provided by the FSC to issue group certification.	35,000	350
Approx. 800,000 ha	40,000	Costs for a 5 years certification. These are exceptional certifications for «super groups».	120,000	3

Source: Forest Stewardship Council, 2011

3. Possibilities for strengthening the synergy between labels

A. Case study: Labelling a larch plantation in France

Using a precise case study, a financial analysis based on the calculation of the Net Present Value (NPV) helps to evaluate the attractiveness for forest managers of subscribing to a certification plan.

This case study presents 4 scenarios:

- **Situation 1:** non-certified forest;
- **Situation 2:** forest carbon project
- **Situation 3:** certified forest for sustainable management;
- **Situation 4:** double certification for carbon and sustainable management.

The period analysed is arbitrarily set at 60 years: a timeframe that covers the entire cycle of the species taken as an example: the larch tree. The area studied is 2,000 ha.

a. Calculation of the NPV and discount rate

The net present value of each scenario is calculated using its standard formula (Equation 1).

EQUATION 1. CALCULATION OF NET PRESENT VALUE

$$VAN = \sum_{t=0}^{n} \frac{(B(t)-C(t))}{(1+r)^t} - I_0$$

With: I_o: Initial investments: the costs of planting and preparing the land;
$B(t)$: Profits generated during the year t;
$C(t)$: Expenditure during the year t;
r: discount rate.

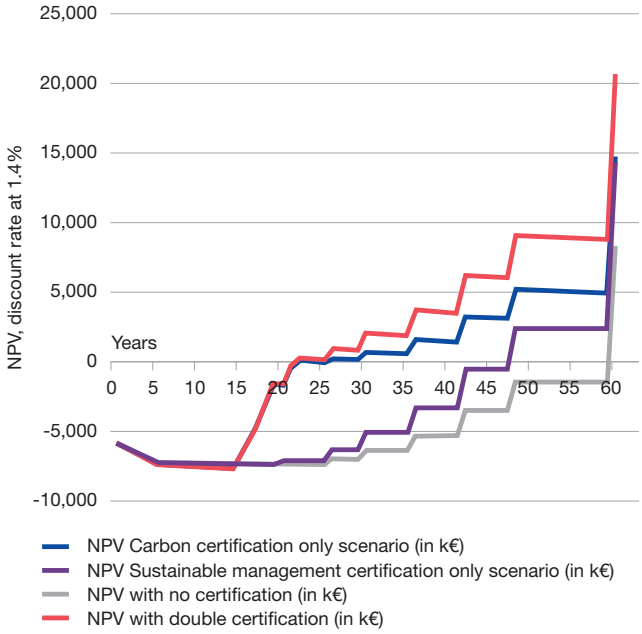
The discount rate is set at 1.4%[22]. This low rate matches the policy rates of 2010 and reflects a moderate preference at present. The details of the equations and the parameters for calculating profits and expenses are included in Appendix 8.

b. The double certification is the most attractive option for the course "larch plantation in declining coppices" with a 60-year end period

In each of the scenarios considered, the costs of certification are low compared to those of forest labour: the total NPVs with or without certification are similar. Moreover, the NPV increases exponentially with the time period of the project in question: it is not a common case, but it is typical for a forest management project where the bulk of its revenue is made during the final harvest.

For nearly 15 years, the NPVs of different projects are similar **overall**, taking into consideration the total costs (of certification and labour) **(Figure 10)**.

FIGURE 10. TOTAL NPVS FOR THE DIFFERENT SCENARIOS CONSIDERED (IN €K) OVER 60 YEARS WITH A DISCOUNT RATE OF 1.4%



Source: I4CE

The choice of a higher discount rate for forest management projects (4%) economically excludes the viability of the non-certification and sustainable management certification scenarios but does not affect the previous conclusions, nor, in particular, the scenarios' order of merit (see Appendix 8).

c. High initial carbon certification costs counterbalanced by faster generation of revenue

Upon closer inspection of the total NPVs over the first 30 years (Appendix 8), we can indeed see higher carbon certification costs (+€36k) at the start of the new management plan compared to the costs of subscription and monitoring for sustainable management certification, because of the high initial investment made by owners to carry out their projects. However, certification costs are negligible compared to labour costs.

As soon as the larch plantation starts to fulfil the conditions for generating carbon credits, the total NPVs of the carbon-certified scenarios rapidly increase: they begin to exceed those of other scenarios in the 15th year, the first year of credit generation, whatever the discount rate.

Subscribing to a certification scheme helps forest managers generate revenue while waiting for their forest stand to become exploitable. This subscription can also be a strategy for managing financial risks: in the event that their stand

22 Stern et al. (2006), "Stern Review on Economics of Climate Change".

declines prematurely, they will nonetheless have garnered an income.

The sustainable management certification affects the NPV as regards the significant premium on the sale price in our example. During the first few years, this increased revenue is very modest since the wood extracted from forests is essentially destined to become firewood with low value, thus generating a low premium.

This analysis only covers financial considerations. However, it should be stressed that other factors can be of interest for a forest manager and may prevail over these financial issues. To mention but a few, sustainable management certification can help reduce the reputation risk or facilitate access to certain markets. Labelling can also convey a manager's anticipation of changes in regulations.

B. Governance, methodological tools, cost reduction: possibilities for synergy between labels

1. Currently, little synergy

It is clear that at present, there are few bridges between carbon standards and sustainable management labels. According to the experts, there are very few projects with both certifications, probably because of constraints to build such synergies (**Table 5**).

Yet several studies demonstrate the strong interest from buyers of carbon offsets as regards the co-benefits, such as the indicators considered by sustainable forest management certifications, even though the difference between buyers' statements and their willingness to pay means putting the results in perspective. On a global scale, it was even the first criterion in the decision to buy offsets for 42% of buyers in 2016, who alone represent 72% of offsets bought (Hamrick and Gallant, 2017). This worldwide tendency is likewise found on a national scale (Tronquet et al., 2017).

2. Towards pooling tools developed by labels

Sustainable management labels now seem to be moving towards a quantification of the impacts of forest management.

In spring 2017, the FSC submitted for consultation a document presenting guidelines to "*demonstrate the impact of [sustainable] forest management on ecosystem services*" (FSC, 2017b).

These guidelines are aimed at helping managers who wish to demonstrate the positive impact of their practices on ecosystem services. The key stages of this assessment (in its current version) are:

- the choice of the services impacted by forest management that will be assessed[23];
- an assessment of the threats to these services;
- a demonstration of the causal link between forest management and impact;
- determining a reference scenario in the absence of sustainable management;
- measuring this impact according to reproducible methods adapted to the local context and recognised as scientifically sound.

With regard to carbon, two impacts can be demonstrated: either the maintenance of a level of carbon sequestration in forests, or its restoration. The indicators considered

23 A list of the eligible impacts is provided in the document's Appendix. It includes the impacts in terms of soil conservation, carbon (maintenance and increase of sequestration), water quality, biodiversity and recreational services.

TABLE 5. POSSIBLE CONSTRAINTS ON SYNERGY-BUILDING BETWEEN LABELS

Type of constraint	Description
Historical	• Constructing a dialogue between labels can take time. Some labels' stage of maturity may not advanced enough to envisage collaborations
Geographical	• The labels with both types of certification may not carry out activities in the same geographical areas for political, historical or legal reasons
Political and competitive	• The labels may have each independently developed similar tools and wish to enhance their own value to increase their own activity • The certification organisations may have no interest in seeing the development of synergies that could undermine their activity
Methodological	• The standards and indicators between sustainable management and carbon labels may differ • Use of the tools developed by the other type of certification may prove too complex or costly in relation to their goals

Source: I4CE

are the forest carbon stock and sequestration flows. The measurements for these indicators, with regard to a reference scenario based on previous measurements or regional data will help to demonstrate either that the loss of carbon stocks is lower in certified forest plots, or that stocks are maintained or increased in certified forests.

A supplementary document to this FSC procedure details examples of methods that can be used by the manager to quantify the various impacts (FSC, 2017c). For carbon, the VCS, Gold Standard, ACR, CAR and CDM methods and the IPCC guidelines are included. In fact, carbon methods already fulfil all the requirements set by the FSC. Nonetheless, carbon standards should not be taken up in full as additionality is still not included in the FSC criteria.

The cost of developing a carbon method is substantial (around $200,000 (Chadwick, 2006)), as is its registration with a carbon standard. Here, cost-sharing for the production of methodologies would be a significant source of savings for labels.

a. Sharing tools to demonstrate the absence of negative impacts of carbon projects, and even certify the co-benefits

Some carbon standards recognise the procedures developed by sustainable management labels as satisfactory in demonstrating the non-negative impact of carbon projects on a series of ecosystem services.

For example, Gold Standard establishes this type of connection with the FSC label. In the label's current version, Gold Standard requires project managers to comply with a number of criteria for sustainable management. To demonstrate this, the project manager can rely on double certification with the FSC certification (**Gold Standard, 2017**).

Other labels may adopt a different strategy and decide to combine their procedures rather than opting for simple recognition. This is the case with the VCS, which in 2012 chose to join forces with *Climate, Community & Biodiversity Standards (CCBS)* and with *Social Carbon* in 2014. The CCBS was launched in 2005 and identifies projects that help climate change mitigation, support local communities and safeguard biodiversity. This label requires projects to have a "positive net impact" in terms of social and environmental co-benefits vis-à-vis a situation where no project would be carried out otherwise.

3. Grouping audits: attractive but complex

a. Factoring in audits carried out for other labels

PEFC France requires the applicant plot to have a "sustainable management document"[24] (PEFC, 2017). This document acts as the label's "assumption of sustainable management guarantee". Using the verification work carried out for those documents by the CNPF (National Centre for Forest Owners) and the ONF (National FForests Office), PEFC strengthens the monitoring on certified plots and the credibility of the framework. Using previous verifications for other certifications may also help to reduce audit times and thus their cost.

In the new version of the standard, published in 2017, Gold Standard explicitly mentions opportunities for double certification between the FSC and Gold Standard[25]. Project managers with FSC certification can use it as a guarantee of their compliance with Gold Standard's "Safeguarding principles."[26] During the carbon audit, the auditor does not then re-audit the criteria covered by FSC certification. In terms of this evaluation of the carbon project's absence of negative impact, the only criteria of Gold Standard's "Safeguarding principles" not covered by the FSC are water considerations. The requirements for water must then be assessed by the Gold Standard auditor[27], in addition to all the criteria specific to carbon certification (additionality, carbon sequestration monitoring, etc.).

b. Reducing the fixed costs of the on-site audit with grouped verifications.

The previous case study highlights the disparity in verification costs between the two certification schemes. Whereas for FSC certification they are estimated at €0.61/ha/year, they are around €14/ha/year for certifying carbon offset projects on the American carbon market (Appendix 8).

Nevertheless, verification in the forest involves substantial fixed costs (e.g. the auditor's travel). Carrying out grouped audits would help to reduce some of these costs to the manager's benefit.

While this is a sound statement in itself, in practice, carrying out grouped audits poses certain challenges, particularly with regard to auditors' training, time constraints (frequency of inspections), and audit efficiency. Maze et al. (2016) notes the contradiction between wanting to reduce costs by reducing the audit time and preserving the "audit's value". This requires balancing between the audit's duration (and therefore cost) and the audit's accuracy.

This study, based on a field experiment comparing different audit durations (whether grouped or not) for agricultural labels, shows that the time-gains of combined audits are minor – less than 22% – and that the main time-saving factor is the preparation for the audit of the farmer.

24 *Within the meaning of French regulations: see Appendix 1 for further information.*

25 *Gold Standard (2017), Gold Standard for the Global Goals Land-use & Forests Activity Requirements.*

26 *Gold Standard, "Requirements of the Safeguarding Principles Assessment".*

27 *The existence of such interactions between labels is no doubt fostered by the fact that the FSC and the Gold Standard are two labels introduced by the WWF.*

c. Auditors' training and associated financial challenges

Performing grouped audits is possible as some auditors are accredited for both sustainable management and carbon certification. This is the case with ECOCERT, accredited to perform audits for sustainable management certification for the PEFC and the FSC in France and carbon audits on VCS projects[28].

However, obtaining accreditation is not free. The FSC has delegated the role of issuing accreditation to Accreditation Services International (ASI). Every year, accreditation represents a registration cost of €1,000 for the certifying body (€3,000 the first year) (Accreditation Services International, 2017). For PEFC France, accreditation is issued by the COFRAC (French accreditation committee). With carbon certification, yearly registration and accreditation costs also apply to the auditors **(Table 6)**.

In addition to these accreditation costs are the costs of auditing the accredited entities: this includes the audit of the entity itself and the audits of a sample of verifications performed by that entity on projects. The cost of this audit by an independent third party can equate to several thousand €os per year for the entity.[29]

The auditors' training must also be taken into consideration. With the FSC, the label has issued guidelines for the training and accreditation of certifying bodies (FSC, 2016c). The FSC's accredited entities can provide FSC auditor training. By way of example, a five-day training course to become an auditor on forest management practices provided by NEPCon (an FSC-accredited entity) costs $1,500 for an auditor. To participate in this kind of training, a certain level of experience is required[30].

TABLE 6. ACCREDITATION RATES APPLIED BY GOLD STANDARD*

	Details	Price
Registration costs	• Managing the certifying body's account	• $ 1,000/account
	• Reactivating an existing account	• $ 2,500/reactivated account
Accreditation costs	• Awarding of accreditation by Gold Standard	• $ 2,500-4,600/entity
	• Accreditation renewal costs (every 36 months)	• $ 1,500/entity
	• Yearly accreditation costs for 5 auditors	• $ 1,500-2,800

* https://globalgoals.goldstandard.org/fees

28 Information from the labels' sites and independent third parties.

29 Expert opinions.

30 https://www.nepcon.org/events/fsc-fm-expert-course

Conclusion

The carbon and sustainable management certification systems have different objectives: the first implies compliance with conditions of additionality and obligation to achieve results; the second ensures compliance with the specifications and demonstrates the continual improvement approach of the forest management (Table 7).

Although their aims are different, these two types of certification can be complementary not only in the forestry management practices adopted, but also in developing methodological tools or ensuring compliance with certification regulations.

Labels are developing links with each other. At present, this cooperation only involves a few labels on very specific points of the standards. At a time when a systemic approach to environmental action is actively promoted – as shown by the Sustainable Development Goals – and is crucial for a global response to all environmental challenges, these rapprochements are much needed. Moreover, such a movement will in all likelihood benefit all concerned.

TABLE 7. COMPARATIVE ANALYSIS OF SUSTAINABLE MANAGEMENT LABELS AND CARBON OFFSET LABELS

		Sustainable management labels	Carbon standards
Nature of the certified element		Goods (timber) and indirectly a service (sustainable management of the ecosystem)	Service (carbon sequestration and sometimes co-benefits)
Fundamental principles of certification		Forest management must meet specifications defined by the label and verified	Forest management enables additional carbon sequestration within forest stands
Follow-up of the certified goods or services		Certification of the control chain	Keeping a registry
Certified areas in the world		448 Mha (2017, PEFC and FSC) 90% of surfaces located in Northern countries	26.8 Mha (2014, according to Ecosystem Marketplace) 70% of areas located in Southern countries
Number of criteria considered*	**Environmental benefits**	37% to 82%**	28% (VCS)
	Economic benefits	35% to 93%	12% (VCS)
	Social benefits	55% to 93%	0% (VCS)
	Carbon	27% to 40%	80% (VCS)
Benefits of certification for forest managers	**Incentive to join the scheme**	**Level of incentive:** variable premium on the timber sale price (5% to 51%) **Time-frame:** premium when sales of wood-products	**Level of incentive:** variable offset price according to the type of project. **Average price of carbon offset on the French voluntary market:** €4.2/tCO_2e in 2015 and €4.4/tCO_2e on the International voluntary markets. **Time-frame:** progressive generation of carbon offsets throughout the project's ¡ifespan. **Special case:** sale of carbon offsets at the beginning of the project if ex-ante offsets are eligible.
Cost of certification for forest managers	**Indicative direct costs of Monitoring, Reporting and Verification**	**Indicative cost:** €0.61/ha/year **Option for managers to group together:** yes **Frequency:** • FSC: yearly + revision for 1 in 5 years PEFC: forest audit on site 1 in 10 years	**Indicative cost:** €14/ha/year **Option for managers to group together:** yes **Frequency:** varies, generally every 5 years

Source: I4CE

** Sustainability Map: The comparison is based on indicators covered by at least one of the selected standards: PEFC, FSC, RSPO, RTRS and VCS. The percentage is calculated based on the number of indicators covered by all standards selected for the analysis.*

*** Example of reading: Sustainable management labels take into account 37% to 82% of the environmental sustainability indicators identified by "Sustainability Map".*

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