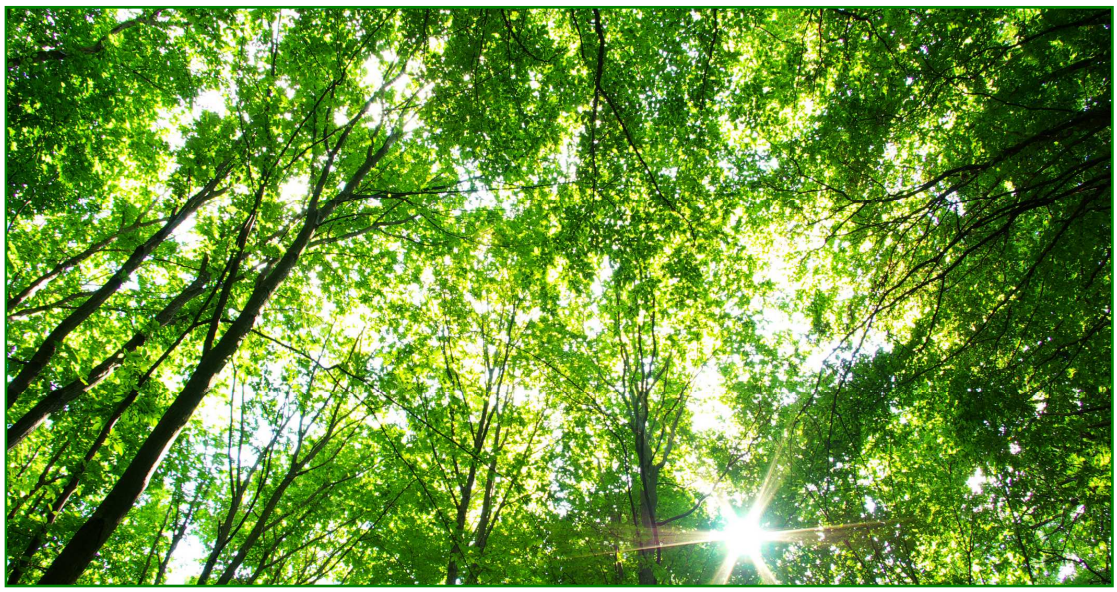
Forestry Carbon Standards 2008



A Comparison of the leading Standards in the Voluntary Carbon Market

Climate, Community and Biodiversity Standard (CCBS)
CarbonFix Standard (CFS)
Plan Vivo Systems and Standard
Voluntary Carbon Standard AFOLU (VCS)

and

The State of Climate Forestation Projects

Eduard Merger
November 2008

Acknowledgments

Particularly I would like to thank Julia Merger (M.A. Sociology, market researcher) for the data analysis of the project developers survey, her advice and efforts.
For the review, comments and corrections many thanks to:

Ian Hamilton (Carbon Positive)
Steve Panfil, PhD (Climate, Community and Biodiversity Alliance)
Moriz Vohrer (CarbonFix Standard)
Alexa Morrison (Plan Vivo Foundation)
Willie McGhee (Plan Vivo Foundation)
Toby Janson-Smith (Voluntary Carbon Standard)

Also, thanks to all participants of the project developers survey who shaped an important component of this report.

About the author:

Eduard Merger is studying forestry science at the Albert-Ludwigs University, Freiburg (Germany) and the University of Canterbury, Christchurch (New Zealand) graduating for a Postgraduate double-degree in 2008 and the beginning of 2010. During his studies he was consulting climate forestation projects located in East Africa and South America. Mr. Merger regards the voluntary carbon market as a great opportunity for new forestation projects worldwide.
Contact: eduard.merger@googlemail.com

About this report:

The purpose of this report shall be a practical approach encouraging the development of forestation projects providing project developers guidance on the selection of the most appropriate forestry carbon standard for the voluntary carbon market. In addition, the report presents CO_2-buyers the quality of carbon credits generated by the scrutinised forestry carbon standards and demonstrates the current state of climate forestation projects.

While conducting this standards comparison the overall picture appeared that the *number* of forestry carbon standards certifying climate forestation projects *is sufficient* for the demands of the voluntary carbon market *if* the presently active standards concentrate on their target groups and project types.

Title: Forestry Carbon Standards 2008 - A comparison of the leading standards in the voluntary carbon market and the state of climate forestation projects

Published by: Carbon Positive - http://www.carbonpositive.net/

Date: November 2008

Table of Contents

Foreword

This report is the *continuation* and an *update* of the paper 'Comparison of Carbon Offset Standards for Climate Forestation Projects participating in the Voluntary Carbon Market', released in May 2008. The *first* publication compared the Climate, Community and Biodiversity Standard (CCBS), CarbonFix Standard (CFS), Plan Vivo Systems and Standard, and the Voluntary Carbon Standard AFOLU[1] (VCS), especially focusing on the relevance to *carbon buyers*.

Complementary, *this* report aims to comprehensively inform not only carbon buyers, but *also* project developers on the major distinctions between existing international forestry carbon standards, and the actual *state* of climate forestation projects[2] development in the voluntary carbon market. Moreover, the paper aims to contribute to more *transparency*, *clarity* and the *promotion* of climate forestation projects development in order to augment sustainable forest management and climate change mitigation.

Together with the 'meta-standard'[3] of the WWF, this paper intends to complement the most *relevant information* on proceedings of the standards for climate forestation projects. While the meta-standard has set a framework of *key principles* ensuring that standards are comprehensive and credible, this report analyses the *criteria* and *guidance* of these.

With the rapid growth of the voluntary carbon market in recent two years (Hamilton et al. (2008), more and more climate forestation projects have *now* gained the opportunity to start their activities, and hence saturate the increasing demand of carbon credits with high socio-economic and environmental benefits.

As *guidance* for readers of this report, on the right upper corner of every page *icons* were placed indicating the relevance of the respective sections to *project developers* and *CO_2-buyers*.

[1] The Agriculture, Forestry and Other Land Use (AFOLU)
[2] Afforestation, Reforestation, Agro-forestry, and Planted conservation forests
[3] http://assets.panda.org/downloads/green_carbon_guidebook.pdf

Executive Summary

Background of the Standards

The backgrounds and the goals of the scrutinised standards vary significantly. The CCBA does *not* account for carbon credits and focuses on the generation of significant socio-economic and environmental co-benefits. The CFS certifies *high quality* forestation projects with an integrated *marketing solution* for CO_2-buyers. The Plan Vivo Foundation generates carbon credits by assisting *community-based* land use projects in developing countries. The VCS AFOLU Program generates *ex-post* carbon credits from land-based projects.

Project Developers

Eligibility

Only CFS and VCS have restrictions in respect to the *project start* and *eligible land use* for forestation activities. CFS projects must have started after the 11th December 1997, and credit start date of VCS projects shall be not earlier than 1st January 2002. Both standards require project developers to evidence that the proposed *planting area* has not been forested for at least 10 years prior to project start date.

Additionality

All four standards accept the methodology of the *A/R CDM* to evidence additionality. Moreover, the CFS also accepts the attestation of *financial additionality* by an approval process of an international bank. Plan Vivo requires the execution of a *barrier analysis* which can be strengthened by a common practice test. The VCS also allows the application of its *own* methodologies that are subject to a double approval process by two independent auditors.

Determination & Quantification of Carbon Credits

The methodological approaches of the standards to *determine* and to *quantify* the baseline, leakage and CO_2-fixation of climate forestation projects *vary considerably* among standards. As the CCBA does *not* account for carbon, it recommends to using the methodologies of the A/R CDM, and *also accepts* the application of the CFS methodology as well as VCS approved methodologies. The CFS has developed a *simplified methodology,* scientifically based on the guidelines of the IPCC[4]. For each Plan Vivo project an *individual methodology* is developed by project developers in cooperation with assisting technical and research organisations. For VCS projects, *A/R CDM methodologies* can be used as well as new proposed methodologies that are subject to a double approval process by two independent auditors.

Permanence

The permanence of climate forestation projects can be assured by the *mitigation* of risks and retaining certain amounts of carbon credits in *buffer systems*. In order to mitigate risks the criteria of CCBS, CFS as well as Plan Vivo require *best practice management* and the fulfilment of other risk *mitigating criteria*. For potential carbon *shortfalls* the standards have different so-called buffer approaches. CFS withholds *fixed 30 %* of their issued CO_2 certificates in a risk buffer, whereas Plan Vivo project developers must retain *minimum 10 %* of their issued CO_2 certificates in a buffer. VCS projects are subject to a risk assessment determining the percentage *(10 - 60 %)* of carbon credits that are managed in a risk buffer account.

[4] Intergovernmental Panel on Climate Change (Scientific advisory board for the UN climate secretariat)

Socio-economic & Environmental criteria

CCBS projects must fulfil the *highest level* of socio-economic and environmental requirements. CFS projects require overall *net positive* socio-economic and environmental impacts by meeting various sustainability criteria. Plan Vivo projects concentrate on the creation of remarkable *community benefits* that integrate positive environmental benefits. VCS guidance requires *basic* socio-economic and environmental benefits and recommends the involvement of other standards.

Certification

All standards involve independent *third parties* for the verification of their projects. However, the time and frequency of verification varies among standards. While, the CCBS requires a verification frequency *every 5 years*, CFS verifications *depend on the age* of the projects, varying *between 2 and 5 years*. Plan Vivo projects are verified for the first time *after* the issuance of CO_2 certificates. From then on the standard recommends verifying its projects *every 3 - 5 years*. VCS projects must be verified *once* at the beginning of a project lifetime. The repetition of verifications *at least every 5 years* is incentivised by financial mechanisms.

Certification Costs

Each project validation and the subsequent verifications with the CCBS are estimated to range between 5 000 and 40 000 US$. The CFS charges 1 500 € (2 050 US$[5]) for validation, 0.50 € (0.68 US$) for each *sold* CO_2 certificate, and estimates each verification procedure to cost between 8 000 and 15 000 € (10 900 - 20 500 US$). CFS / CCBS combined certification is estimated to cost 10 000 - 20 000 € (13 700 - 27 400 US$). Plan Vivo validation costs between 5 000 and 12 500 US$ and the Foundation charges 0.30 US$ for each *sold* CO_2 certificate. Each verification procedure is forecast to cost between 15 000 and 30 000 US$. The VCS validation and verification is estimated not to remarkably differ from other standards, ranging between 15 000 and 30 000 US$ for each third party audit. A further 0.04 US$ for each CO_2 certificate must be paid directly *after* issuance.

State of Project Developers & *Climate Forestation Projects*

Project Developers Survey

Project developers with A/R CDM[6] experience regard the *non-acceptance* of forestry carbon credits in the EU Emissions Trading Scheme and the *long registration* procedures of A/R CDM projects as the most decisive constraints of the Kyoto market.

Both, A/R CDM-experienced as well as inexperienced project developers remarkably *lack the knowledge* on the financial implications of *ex-ante* and *ex-post* carbon credits on their projects.

About 84 % of project developers implementing climate forestation projects already *apply* or *consider applying* carbon accounting standards from the voluntary carbon market. For project developers, the *most important* criteria of a carbon accounting standard is public *credibility* and the *assurance of permanent CO_2-fixation*, followed by the *practicability* of the standards application, the *practical CO_2-quantification* and the provision of *transparency*.

Currently, more than *half* of all climate forestation projects are located in South America/Central America (31 %) and Africa (25 %) followed by Oceania/Australia (16 %) and

[5] Exchange rate 10.10.2008, 1 US$ = 0.73156 €, 1 € = 1.36694 US$

[6] Afforestation / Reforestation Clean Development Mechanism (Mechanism of the UN to address climate change mitigation through forestation projects in developing countries)

Asia (10 %). The *outlook* for climate forestation projects development shows a slight *shift* towards Asia and Europe.

Standard Setters

By October 2008, standards have *registered* in total 8 climate forestation projects and have a further 15 projects in their *pipelines*. In addition to that, developers of more than 150 climate forestation projects have *contacted* the standard setters with the interest to become certified.

CO_2-Buyers

Carbon Registries

Addressing the approaches of standards' registries, the CFS, Plan Vivo and VCS have remarkably *different approaches*. CFS has a web-based registry system with transparent tracking functions. Plan Vivo displays all sales on its webpage. VCS works with four registries that hold each others assets.

Transparency

The CCBS provides all *basic* project information on its website. Plan Vivo has a *more advanced* web interface including ancillary informative documents. The CFS has established a *user-friendly* web interface allowing project developers to administrate their own project webpage with *customer-oriented features* such as googlemap, pictures, news, etc. Further, the CarbonFix websystem empowers CO_2-buyers to trace their certificates, identifying the location of planted trees. The VCS registries are currently *constructing* a project database that will display all *basic* project information.

Purchase & Pricing of CO_2 Certificates

CO_2-buyers can purchase carbon units called '$VER_{futures}$' from CFS-certified projects either directly from project developers via the CFS website or from brokers that cooperate with projects. Similarly, *Plan Vivo Certificates* can be purchased from project developers or from brokers that are registered by the Plan Vivo Foundation. Also, VCS carbon credits (*Voluntary Carbon Units*) can be purchased from project developers or from brokers.

In 2009, the CFS expects a price *range* of 10 - 20 € (14 - 27 US$) for each CO_2 certificate, whereas the Plan Vivo Foundation estimates a price between 8 and 30 US$. The VCS anticipates prices between 12 and 18 US$ for its credits.

Summary forestry carbon standards 2008

Standard	CCB Standards	CarbonFix Standard	Plan Vivo System and Standards	Voluntary Carbon Standard (AFOLU)
Background				
Goals	Net positive climate, community and biodiversity benefits	High quality carbon credits from sustainably managed forests	Supply of carbon credits from rural communities in developing countries promoting sustainable development	Creation of credible ex-post carbon credits
Project types	All land-based projects	Projects converting non-forest to forest	Aff./Reforestation, Agro-forestry, IFM, REDD	Aff./Reforest./Reveg., ALM, IFM, REDD
Types of carbon credits	N/A	Ex-ante	Ex-ante & Ex-post	Ex-post
Eligibility				
Project Start Date	No restrictions	11th December 1997	No restrictions	No restrictions
Project Location	Internationally	Internationally	Internationally	Internationally
Additionality				
Testing methods	A/R CDM / CCBA approved methodologies	A/R CDM / Financial analysis	Barrier analysis / Common practice / A/R CDM	A/R CDM / Approved VCS methodologies
Methodologies to determine and quantify CO_2				
Baseline, Leakage, CO_2-Fixation, Monitoring	A/R CDM / CCBA approved methodologies	CFS methodology	Project specific methodologies / A/R CDM	A/R CDM / Approved VCS methodologies
Permanence				
Risk buffer	-	30 %	Minimum 10 %	10 - 60 %
Socio-economic and environmental co-benefits				
Socio-economic benefits	★★★	★★	★★★	★
Environmental benefits	★★★	★★	★★	★
Certification				
Verification intervals	5 yearly	2 - 5 yearly	Recommended 3 - 5 yearly	5 yearly financial incentive
Accredited 3rd parties	✓	✓	✓ after issuance of carbon credits	✓
Certification time period	2 - 6 months	3 - 6 months	3 - 18 months	2 - 4 months
Cost & Fees				
Validation	5 000 - 40 000 US$	1 500 € (2 050 US$)	5 000 - 12 500 US$	15 000 - 30 000 US$
Verification		8 000 - 15 000 € (10 900 - 20 500 US$) +CCBS 2 000 - 5 000 € (2 700-6 800 US$)	15 000 - 30 000 US$	15 000 - 30 000 US$
CO_2 certificates fees	-	0.50 € (0.68 US$) per sold VER	0.30 US$ per sold VER	0.04 US$ per issued VER
Supply of *climate forestation projects* 2009				
Registered projects	5	1	3	-
Projects in the pipeline	8	5	2	-
Carbon Registries & Prevention of double counting				
Carbon registry	-	Online registry	Online registry	APX, Caisse des Depots, TZ1, BNYM
Transparency				
Publicly available project information	★★	★★★	★★	★
CO_2 certificates prices				
Expected tCO_2 prices in 2009	Premium prices	10 - 20 € (14 - 27 US$)	8 - 30 US$	12 - 18 US$

★ The stars are set in relation to the requirements of each standard. The more stars, the higher the transparency and co-benefits level of a standard.

Glossary

AFOLU	Agriculture, Forestry and Other Land Use Projects
AIE	Accredited Independent Entity
ALM	Agriculture Land Management
A/R CDM	Afforestation and Reforestation Clean Development Mechanism
ARR	Afforestation, Reforestation, Revegetation
CCAR	California Climate Action Registry
CCBS	Community, Climate and Biodiversity Standard
CDM EB	Clean Development Mechanism Executive Board
CFS	CarbonFix Standard
CH_4	Methane
DOE	Designated Operational Entity
DNA	Designated National Authority
EU-ETS	European Union Emission Trading Scheme
FSC	Forest Stewardship Council
GMO	Genetically modified organisms
HCV	High Conservation Value
IFM	Improved Forest Management
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
ISO	International standardisation Organisation
LULUCF	Land Use, Land Use Change and Forestry
MSF	Meta-standard framework
$MtCO_2$	Million metric tonnes carbon dioxide
N_2O	Nitrous oxide
NFPC	Not-for-profit Corporation
NGO	Non-governmental organisation
OTC-market	Over-the-Counter Market
PDD	Project Design Document
PIN	Project Idea Note
REDD	Reduced Emissions from Deforestation and Degradation
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit
WWF	World Wide Fund for Nature

Tables

Figures

1. Introduction

'*Sustainable forest management of both natural and planted forests is essential to achieving sustainable development. It is a means to reduce poverty, halt the loss of forest biodiversity, reduce land and resource degradation, and contribute to climate change mitigation' (Nabuurs et al. 2007).*

At present forest ecosystems cover about 30 % of the global land mass, being an immense carbon sink storing more than double the amount of carbon in the atmosphere (Canadell and Raupach 2008). Annually, the global *net* forest loss is estimated to be at a rate of 7.3 million hectares per year which equals almost the size of Switzerland, and is releasing about 1 100 $MtCO_2$-equivalent (FAO 2006).

Although climate forestation projects can also be implemented as an instrument of the Kyoto Protocol, the great potential of such projects has *not* yet been saturated at all. By October 2008, there is still *only 1* registered A/R CDM project[7] out of 1170 CDM projects[8]. The reasons for this shortfall are constrictions such as the non-acceptance of land use, land use change and forestry (LULUCF) projects under the official EU Emissions Trading Scheme, the issuance of so-called *temporary credits*, the *long-lasting* and *complicated procedures* as well as the *complexity* of modalities set by the responsible UN bodies.

As a consequence, forestry projects have *shifted* to the voluntary carbon market. The reports of Hamilton et al. (2007, 2008) analysed the yearly state of the voluntary carbon markets and showed that the forestry sector has taken up a *large share* in the market. In 2006, climate forestation projects accounted for 33 % (3.18 $MtCO_2e$) of the voluntary carbon market[9] whereas in 2007, climate forestation projects *could not keep up* with the rapid growth of the voluntary carbon market, accounting solely for 10 % (4.21 $MtCO_2e$).

The year 2007 can be considered as the year of standards creation. The appearance of new standards can be regarded as a fundamental step to guarantee a *robust basis* for this rising market. However, with an increasing number of carbon accounting standards in the voluntary carbon market, there is concurrently a need to *evaluate* these. So, there is an imperative requirement to shed light into the jungle of carbon accounting standards, provide transparent and sufficient information and assistance to various participants in the voluntary carbon market, particularly *project developers* and *CO_2-buyers*.

The main goal of all forestry carbon standards must be to ensure that carbon credits are 'real, additional, measurable, permanent, independently verified, unique and have sustainable development benefits'.

WWF Green Carbon Guidebook (WWF 2008)

[7] Afforestation / Reforestation Clean Development Mechanism
[8] UNEP Risoe CDM/JI Pipeline Analysis and Database, 1st October 2008, http://www.cdmpipeline.org/index.htm
[9] Only Over-the-counter Market, Chicago Climate Exchange excluded

1.1. Report Structure

This paper aims to inform and assist *project developers* of climate forestation projects and *CO_2-buyers* to *select* the most appropriate forestry carbon standards for their credits, respectively projects. In addition, the report provides all participants and interested parties of the voluntary carbon market with valuable information on the *current state* of standards and climate forestation projects.

Page 14 to 17 - The first part of this study provides a general overview on the *background* of the standards.

Page 18 to 46 - This is followed by a chapter especially compiled for *project developers* that compares components of standards relevant for them. Here, the standards' criteria on *eligibility*, *additionality*, the *methodological approaches* and standards' guidance to determine the amount of carbon credits are presented. In addition, the *assurance of permanence*, criteria on socio-economic and environmental *co-benefits*, the *certification* procedures, and *costs and fees* of certification are compared.

Since criteria on *additionality*, *permanence* as well as socio-economic and environmental *co-benefits* are essential components for *CO_2-buyers* as well, these sections are also relevant to CO_2-buyers.

Page 47 to 56 - The chapter 'State of Project Developers & Climate Forestation Projects' is targeted at *all participants* of the voluntary carbon market. It describes the outcomes of a *survey* conducted with project developers in July 2008, and quantifies the *current* and the *expected* amounts of climate forestation projects. Additionally, standard setters provided their expectations of climate forestation projects development and the *supply* of carbon credits in 2009.

Page 57 to 63 - The chapter 'CO_2-Buyers' analyses each standard's set-up with regard to the relevance of CO_2-buyers including standards' *registries*, *transparency*, *pricing* of CO_2 certificates and the *purchase opportunities*.

Page 64 to 69 - The final 'Summary' and 'Recommendations' chapters summarise the most *substantial findings* of this study and give *recommendations* to project developers, CO_2-buyers as well as to standard setters.

2. Research Methods

The study was conducted by a review of the *latest* literature on the carbon markets and two online *surveys*.

Literature review

The literature review included the latest carbon markets publications, specifically reports on the voluntary carbon market. This provided the background of this work and created the foundation for the surveys. In addition, the *demands* of CO_2-buyers were identified. Complementary, the standards' guidance documents were reviewed analysing their background and identifying comparable parameters. Also, this provided further *basis* for the construction of the surveys.

The first survey was composed of a questionnaire designed for *project developers* developing climate forestation projects; the second survey included questions addressed to the standard setters.

Project developers survey

The survey for project developers was performed in order to research the state of climate forestation project development and to find out project developers' *experiences* and *demands* on forestry carbon standards.

The results demonstrated in the chapter 'State of Project Developers & Climate Forestation Projects' are based on an online survey carried out in July 2008 with 71 participants, developing about 260 projects. The Climate_L and Forest_L newsletters[10] were used to address the project developers. No regional restrictions were made. Responses were captured from representatives of NGOs, private companies, research institutions and governmental organisations.

Data analysis of this survey was carried out with SPSS including a plausibility check, as not all project developers filled out the questionnaire in full. Controversial particulars were excluded. The outcomes of the survey were evaluated using descriptive analyses methods.

Standard setters survey

The survey for standard setters gained data on the *actual* state of the standards. Furthermore, standard specific information that was not available in its documents or on their websites was obtained by personal communication with standards representatives, incorporated in the report. Complementary to this, the standards setters reviewed the representation of their standards and had the opportunity to comment.

The two surveys and the standards' comparison process were shaping an overall impression of the standards showing the cores of each standard and forming the conclusions for the recommendations.

[10] http://www.iisd.ca/

3. Background of the Standards

All examined standards have different *backgrounds*, and therefore follow *different approaches* and *objectives*. In the following sections the status of the standards' development, the history of each standard, and their organisational structures are described. Furthermore, their *goals*, *eligible project types*, and *carbon credit types* are presented.

Status of standards' development

Table 1 indicates the present state of the standards' versions and the projected further development of these. For this report the latest available versions of the standards were used, respectively the Draft version 2 of the CCBS, version 2.1 of the CFS, version 2008 of Plan Vivo Standards, and version v2 of the VCS Program. Part of the v2 the first AFOLU version v1 was used which is currently converted into ISO[11] language and expected to be released by the end of 2008.

Table 1: Status of standards' development

Standard	Latest Valid Version	Release	Next Revision	Expected Release
CCBS	Version 1	May 2005	Version 2.0 currently under revision	December 2008
CFS	Version 2.1	October 2008	2009 Including a public review	Unknown
Plan Vivo	2008	October 2008	2010	Unknown
VCS AFOLU	Version v2	November 2007	Currently conversion of AFOLU guidance into ISO language	End 2008

3.1. Climate, Community & Biodiversity Standards (CCBS)

Background

The Climate, Community and Biodiversity Standards were developed by the Climate, Community and Biodiversity Alliance (CCBA), a *cooperation* of companies and non-governmental organisations.

The CCBA does *not* issue carbon credits and concentrates on the generation of co-benefits. The standard can be used *in combination* with other standards such as A/R CDM or standards of the voluntary carbon market that include comprehensive and credible carbon accounting methods. However, this is not a requirement, and projects may apply only the CCB Standards to evidence their socio-economic and environmental co-benefits.

The CCBA is made up of members including Conservation International, CARE, Rainforest Alliance, The Nature Conservancy, Wildlife Conservation Society, BP, GFA Consulting Group, Intel, SC Johnson, Sustainable Forest Management Ltd., Weyerhaeuser, and other advising institutions.

Organisational structure

The CCBA is build up of the *Director*, the full *CCBA membership* and the *CCBS Committee*. The Director drafts all documents and is responsible for the circulation of important information

[11] International Organisation for Standardisation

as well as the publication of project documents on the CCBA website. The *CCBA membership* is a body that takes the final decisions concerning the revision of the standards and terms of reference, and creates the *CCBS Committee*. The *Committee's* responsibilities are to assist the *Director* and to appropriately balance the concerns of all interested parties.

Goals
CCBA's main goal is to stimulate the development and marketing of land-based projects that deliver credible and positive climate, community and biodiversity benefits. The organisation aims to provide *flexible rules* and *guidance* for the development of an integrated project design.

Eligible project types
The CCBA verifies *all* land-based project types.

3.2. CarbonFix Standard (CFS)

Background
The CFS was developed by the *non-profit* association CarbonFix which is accredited by the UNFCCC. Its members are experts and scientists in the fields of forestry, environment and development aid. The association was founded in 1999. The first version of its standard was launched at the UN climate conference in December 2007.

Organisational structure
The CarbonFix association has its *secretariat* in Germany. From here it supports project developers, CO_2-buyers and international certification bodies that work with the CarbonFix Standard. Also, liaison with the media is handled by the secretariat.

For the continuous development of the Standard, the members of its *Technical Board* are responsible. They also validate projects before they can be verified and registered. The *Technical Board* is supported by the members of the *CarbonFix Alliance*, composed of a network of institutions and individuals with expertise knowledge.

Goals
CarbonFix's main objective is to provide project developers a high quality standard that is practically applicable. Certified projects should be able to concurrently deliver real and traceable CO_2 certificates to the voluntary carbon market. Moreover, the CFS seeks herewith to enhance eco-investments in *sustainably managed climate forestation projects* in developing countries.

Eligible project types
Within the CFS framework land use change projects are accepted that convert *non-forest* land to *forest* land. This includes planted *conservation forests*, planted *sustainably managed forests* and areas that are protected leading to a land use change of non-forest to forest. With the version 2.1, the CFS has also accepted *agro-forestry* projects.

Carbon credits types
Under the CarbonFix Standard *ex-ante* carbon credits are generated and registered.

3.3. Plan Vivo System and Standards

Background

The Plan Vivo System and Standards originate from a research project in southern Mexico in 1994. Plan Vivo was developed by the Edinburgh Centre for Carbon Management (ECCM) in collaboration with El Colegio de la Frontera Sur (ECOSUR) and the University of Edinburgh. Between 2002 and 2008, the Standard was run by the not-for-profit organisation BioClimate Research and Development (BR&D) which was dissolved in 2008 and transferred to the Plan Vivo Foundation registered as a *charity organisation* under Scottish law.

Organisational structure

The Plan Vivo Foundation consists of its *Board of Directors* which approves all amendments to the Plan Vivo System, provides strategic guidance and supports projects. Further, the Foundation is supported by its *Technical Advisory Panel* which is responsible for technical review and advice concerning the Plan Vivo projects. A *Stakeholder Forum* provides input and feedback on the Plan Vivo System and its projects.

Goals

The core of the Plan Vivo System and Standards is to enhance climate change mitigation from rural *communities* and *farmers* promoting sustainable livelihoods and alleviating poverty. The standard's objectives are to protect, restore, and improve natural productive systems, sequester carbon, and deliver ecosystem payments to project participants.

Eligible project types

The Plan Vivo Foundation accepts *afforestation, reforestation, agro-forestry, restoration, conservation, improved forest management* and *REDD*[12] projects. Eligible planting activities for its projects are those that use native and naturalised species.

Carbon credits types

Within the Plan Vivo framework ex-ante as well as ex-post carbon credits can be generated and verified. *Ex-ante* crediting is applied to sequestration activities whereas *ex-post* crediting is applicable to avoided deforestation activities.

3.4. Voluntary Carbon Standard (VCS AFOLU)

Background

The VCS is a standard for all greenhouse gas offset project types and was initiated by The Climate Group, the International Emission Trading Association, and the World Economic Forum, in 2005. The VCS AFOLU Program was initiated in November 2007, supported by experts from the four VCS AFOLU project categories; ARR[13], ALM[14], IFM[15], REDD, together with risk experts, investors, NGOs, and project developers. The AFOLU Program is currently converted into ISO language and will be released and start to operate by the end of 2008.

Organisational structure

The VCS Association is registered under Swiss law and is structured into the *VCS Secretariat*, the *VCS Board* and *Technical Advisory Groups*. The *Secretariat* responds to stakeholder queries, liaises with the media, enters into contracts, and manages relationships with registry operators and accreditation bodies, as well as the VCS website. The *Board* can

[12] Reduced Emissions from Deforestation and Degradation
[13] Afforestation, Reforestation, Revegetation
[14] Agricultural Land Management
[15] Improved Forest Management

request support of the *Technical Advisory Groups* that provide detailed technical recommendations.

Goals

The VCS was designed to *standardise* and *provide transparency* and *credibility* to the voluntary carbon market. It aims to augment business, consumer and government confidence, and to deliver trusted and tradable voluntary offset credits with unequivocal ownership. Moreover, the VCS seeks to *stimulate investments* in emission reductions, carbon offsets, and innovation in reduction technologies that keep validation and verification costs *low*.

Eligible project types

The VCS AFOLU Program includes project activities such as *Afforestation, Reforestation and Revegetation*, Agricultural Land Management, Improved Forest Management, and REDD.

Carbon credits types

The standard generates *ex-post* carbon credits.

Synopsis

Table 2: Eligible project and carbon credits types[16]

Standard	Forestation	IFM[17]	Agro-forestry	REDD	Other LULUCF	Carbon credits
CCBS	✓	✓	✓	✓	✓	**X**
CFS	✓	**X**	✓	**X**	**X**	Ex-ante
Plan Vivo	✓	✓	✓	✓	**X**	Ex-ante Ex-post[18]
VCS AFOLU	✓	✓	✓	✓	✓	Ex-post

[16] The difference between ex-post and ex-ante is explained more in detail in section 'Ex-post & Ex-ante Carbon Credits'
[17] Improved Forest Management
[18] Ex-post crediting is only applicable to avoided deforestation activities

4. Project Developers

This chapter focuses on standards' components relevant to *project developers* who implement climate forestation projects for the voluntary carbon market. It provides a detailed overview on the major distinctions of the analysed standards.

Initially, the *eligibility* criteria are described, followed by the methodologies to determine the *additionality* and to *quantify* the net CO_2-fixation. Thereby, the A/R CDM methodologies were used as a *benchmark*. Furthermore, standards' set-up in respect to the socio-economic and environmental *co-benefits*, *permanence*, as well as the *certification* procedures and *costs* for these procedures are compared.

4.1. Eligibility Criteria

The standards have set *different eligibility criteria* that determine the framework for potential project development. The criteria can be distinguished by the *eligible project start date*, the *eligible planting area* and the allowed *location* of the projects. These vary among standards as described in the following sections.

Collectively, *all* standards require projects to act according to the regulatory framework of the respective host country including the observation of all *national laws and regulations*. Further, the standards have in common that they oblige *secured land tenure* and *clear land ownership* of the project area and *carbon rights*. The standards do not have regional restrictions and allow project development *globally*.

4.1.1. Climate, Community & Biodiversity Standards (CCBS)

The CCBA does *not restrict* the project start date of its projects. Planting is allowed to be conducted anywhere as long as there are positive net benefits on climate, community and biodiversity.

4.1.2. CarbonFix Standard (CFS)

Projects certified by the CFS must have been started *after* 11th December 1997, the date of Kyoto Protocol's adoption.

Eligible project area must be land that has not been covered by forest for at least *10 years* before the project starts. Project developers have to provide evidence that the proposed planting area was *not deforested* in order to generate CO_2 certificates.

Furthermore, CFS projects must reserve at least 10 % of their area for *conservation* purposes, and forestation activities are not allowed to take place on wetland. In addition, project developers must justify their choice of tree species if these are not native and must evidence that their planting land was not used for essential local food production.

4.1.3. Plan Vivo System and Standards

Plan Vivo does *not restrict* the projects' start date and there are no restrictions concerning the eligible planting area. Also, already implemented projects can be registered. However, *retroactive crediting* for implemented project activities is *not allowed*.

4.1.4. Voluntary Carbon Standard (VCS AFOLU)

The project *start date* for non-AFOLU projects shall not be *before* 1st January 2002. The start date for AFOLU projects is not restricted if the project is validated and verified against the VCS by 1st October 2010, and the project developer can verifiably demonstrate that it had been designed and implemented as a climate change mitigation project from its inception.

Prior to 2002 the project must have applied an externally reviewed methodology and engaged independent carbon monitoring experts to assess and quantify the project's baseline scenario and net emissions reductions or net CO_2-fixation. The earliest *credit start date* under the VCS 2008 for non-AFOLU projects shall be 28th March 2006, and for AFOLU projects shall be 1st January 2002.

In addition, evidence must be given that the proposed project area was *not cleared* in order to generate carbon credits, and that the project area was not forested at least for *10 years* prior to project start.

Synopsis

Table 3: Eligibility criteria of the standards

Standard	Project Start Date	Eligible Planting Area	Eligible Project Location
CCBS	No restrictions	No restrictions	Internationally
CFS	11th December 1997	10 years no forest prior to project start	Internationally
Plan Vivo	No restrictions	No restrictions	Internationally
VCS AFOLU	No restrictions	10 years no forest prior to project start	Internationally

4.2. Additionality

In theory the concept of *additionality* is fairly simple; a project must provide evidence that without the *additional financial means* from the sale of CO_2 certificates the project can not be implemented.

However, in practice additionality has become one of the most *controversial issues* for all types of carbon projects. For carbon buyers it is essential to know that their money is decisive for the implementation of a project, and does not only generate additional financial benefits to project developers.

In order to *prove* the additionality of a project, all scrutinised forestry standards require the application of the *A/R CDM additionality tool*[19] or similar guidelines. In the following, the concept of the A/R CDM additionality is elaborated, and subsequently standards' approaches on the additionality are described.

[19] http://cdm.unfccc.int/methodologies/ARmethodologies/AdditionalityTools/Additionality_tool.pdf

4.2.1. A/R CDM

The A/R CDM additionality assessment tool requires project developers to undertake the following steps:

1. The project developer must provide evidence that the generation and selling of carbon credits is *crucial* for the decision to implement a project.
2. A minimum of *two land use scenarios* for the proposed project have to be identified and described - one 'project scenario' and one 'without-project scenario'.
3. Subsequently, an *investment analysis* must be carried out comparing the determined scenarios. If this analysis does not prove that additional financial means from the sale of carbon credits are required to implement the project, a barrier analysis must do so. Such a *barrier analysis* must show e.g. that the lack of technical expertise or the lack of law enforcement is decisive for project implementation. Here, evidence must be provided that the sales of CO_2 certificates will result in overcoming these barriers.
4. Finally, a *common practice* test must be carried out, showing that the project is not common practice in comparison with similar projects that do not generate carbon credits.

Only if all these steps are satisfactorily accomplished the project can be considered as additional.

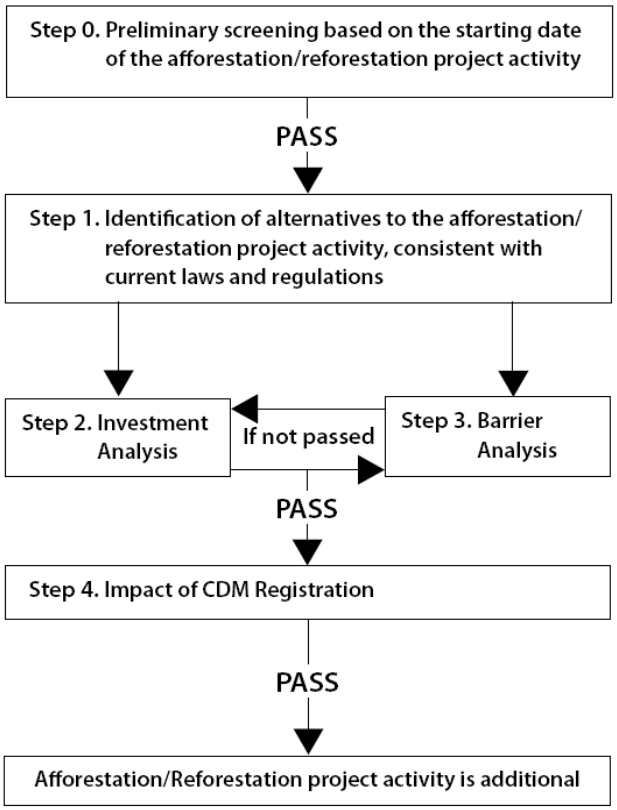


Figure 1: A/R CDM Additionality Test

Source: Pearson et al (2008)

4.2.2. Climate, Community & Biodiversity Standards (CCBS)

The standard requires the application of methodologies that are approved by the A/R CDM Executive Board, follow the IPCC 2006 Good Practice Guidance or are approved by the CCBA. By the time of this publication no such methodologies had yet been approved by the CCBA.

4.2.3. CarbonFix Standard (CFS)

Besides the proof of additionality according to the A/R CDM methodology, CFS allows project developers to evidence their financial additionality by an *official assertion* from an internationally recognised bank[20]. Equally to the A/R CDM, the bank approval must attest that the project is not feasible without the additional carbon income. *Moreover*, evidence must be given that a forest is not likely to establish itself in a natural way, and that forestation activities are not enforced by any law.

4.2.4. Plan Vivo System and Standards

Plan Vivo accepts the application of the A/R CDM methodology. If this is not applied, projects must demonstrate that they are *not* supported by external legislative and commercial interests. Furthermore, project developers must carry out a *barrier analysis* identifying financial, technical institutional, ecological, social or cultural barriers, and evidence that the proposed activities would not have occurred in the absence of the project. In order to strengthen additionality, a *common practice test can* be added to the barrier analysis, demonstrating that similar activities are not common practice in the surrounding area.

Plan Vivo projects normally operate in rural areas of developing countries lacking financial, technical and institutional capacity, and investment in such areas is normally *not likely* to occur. In addition, since only native or naturalised species are allowed to be planted, there are additional environmental benefits.

4.2.5. Voluntary Carbon Standard (VCS AFOLU)

Within the VCS framework project developers can prove additionality using the A/R CDM methods or additionality tests *approved* by the VCS. Here, a *Project Test*, a *Performance Test* or a *Technology Test* can confirm the additionality.

The *Project Test* requires the execution of an *investment* barrier analysis, a *technological* barrier analysis, or an *institutional* barrier analysis. In the investment analysis, project developers have to prove that they have, or can overcome, financial constraints due to carbon credits sales; in the technology barrier analysis project developers must demonstrate that their projects have overcome technological barriers by additional income due to carbon sales; and in the institutional analysis the project developers must prove that it has overcome organisational, cultural or social barriers. *Finally*, as in A/R CDM, evidence must be given that project activities are not *common practice* in the particular region of the project.

The remaining two tests such as the *Performance* as well as the *Technology Test* must be based on a VCS methodology. These methodologies are subject to a double approval process by two independent auditors. By the time of publication of this report no such methodologies[21] had yet been approved by the VCS Program.

[20] The bank must be one of the 50 biggest banks worldwide: http://www.gfmag.com/c_aw/0510_03.php
[21] http://www.v-c-s.org/methodologies.html (13.10.2008)

Synopsis

Table 4: Potential additionality tests methods

Standard	A/R CDM	Other methodologies
CCBS	✓	CCBA approved methodologies
CFS	✓	Financial additionality
Plan Vivo	✓	Barrier analysis, Common practice test
VCS AFOLU	✓	Project, Performance, Technology Tests

4.3. Quantification of Carbon Credits & Monitoring

For the quantification of credible and verifiable carbon credits project developers must determine the amount of CO_2 that is stored by the growth of forests. In order to quantify the real greenhouse gas benefits of a project, emissions from the *baseline* scenario as well as *leakage* effects, and the *project emissions* must be deducted from the CO_2 that is stored by the forest, as figure 2 illustrates.

Figure 2: Quantification of carbon credits

The following sections describe the existing A/R CDM methodologies, followed by the standards' approaches to quantify these parameters.

For the quantification of the different variables, project developers must consider different *carbon pools* that are likely to be of significant influence on the overall greenhouse gas benefits. Thereby, it is best practice to apply the principle of the *conservative approach* where uncertainties of quantifications must not lead to an overestimation of CO_2 certificates.

Baseline

The baseline is a *hypothetical scenario* of a project describing the most likely development of the project area that would have occurred if a project would not have been implemented. Consequently, the baseline scenario must be a plausible constitution that creates an acceptable *basis* for the quantification of *net* greenhouse gas benefits.

Normally, the setting of the baseline is composed of the following iterative steps: Initially, the *determination of the planting area* and the *identification of plausible land use scenarios* with and without a project must be conducted. Further, project developers must describe the applied *stratification*[22] methodology that separates the different land use and vegetation types within the project area. The baseline must then be determined using rigorous *scientifically based mathematical formulas* that calculate the existing biomass stock on the proposed project area and convert it into CO_2 tonne equivalents (tCO_2). Moreover, if

[22] Grouping of relative homogenous land use types or vegetation types in order to increase the accuracy and efficiency of measurements and estimates

significant amounts of other greenhouse gases are likely to be emitted, their quantification must also be considered and estimated on a *rigorous scientific basis*.

Leakage

Since forestry projects generally interact in large spatial dimensions and in complex socio-economic environments, the implementation of these may cause significant *changes of peoples' activities*. Such activities may create so-called *leakage effects*. These are greenhouse gas emissions outside the project area that are attributable to project activities.
For instance, such effects can be induced by the displacement of grazing or agricultural activities that continue *after* the project start, and hence produce emissions *outside* the project area. The quantification of leakage emissions must be assessed in the same manner as the baseline - on *rigorous scientifically based* methodologies.

Project emissions

Generally, project management is associated with further emissions such as *fuel consumption* for transportation or for the usage of machinery, and emissions due to *administrative* project activities. Although project emissions normally represent *solely a fraction* of the net greenhouse gas benefits of a climate forestation project, it is best practice to quantify these as well.

Quantification of CO_2-fixation

Since standards generate ex-post as well as ex-ante carbon credits, there are *two* different approaches to *quantify* the CO_2-fixation of forests. While the estimates of *ex-ante* credits are based on scientific rigorous *growth models* that determine the future CO_2-fixation, *ex-post* credits are quantified on the base of *forest inventories*. Consequently, ex-ante credits are generated at the beginning of a project whereas ex-post credits are generated after the trees have sequestered significant amounts of carbon - see section 'Ex-post & Ex-ante Carbon Credits' (page 48).

It is of utmost importance that after the issuance of *ex-ante* carbon credits *periodic verification* is conducted using *accurate inventories*. The inventories must continuously adjust the discrepancies between the predicted and the actual carbon fixation. Furthermore, it must be guaranteed that *shortfalls* due to adaptations are *compensated* throughout the entire project lifetime.

Monitoring

Normally, project developers must *periodically measure* the timely carbon change in order to determine either the ex-post carbon credits or adjust the predicted carbon storage of ex-ante credits. Thereby, it is best practice to accurately monitor carbon changes and comprehensively document these in a monitoring plan that is periodically and independently verified.

Carbon Pools & Conservative Approach

Carbon Pools

For the quantification of the described parameters such as *CO_2-fixation*, *baseline* and *leakage*, project developers of forestry projects must consider different *carbon pools* that are likely to significantly increase and decrease.

The IPCC categorises carbon pools of climate forestation projects into the following parameters as figure 3 illustrates:

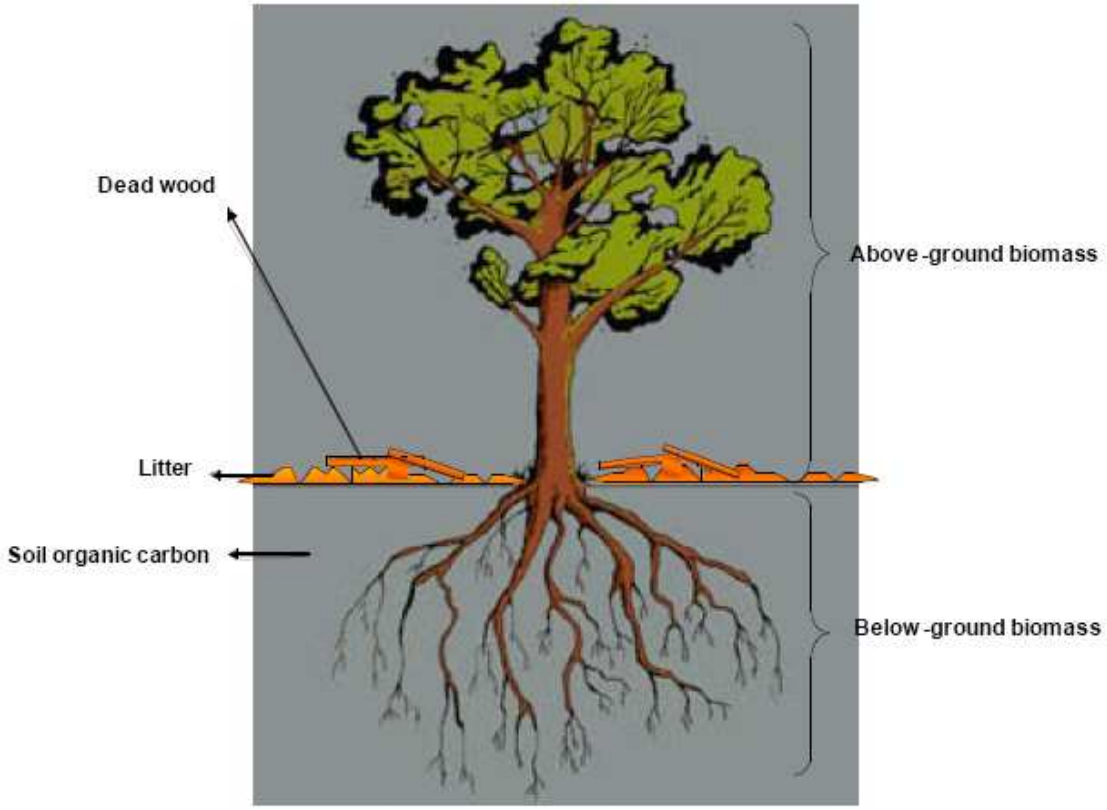


Figure 3: Carbon pools of climate forestation projects

Source: Robledo et al (2008)

Conservative approach

The principle of the so-called 'conservative approach' requires that all quantifications are conducted on a basis of *best available scientific basis*, resulting in precise and accurate climate benefits without overestimating these. If the applied calculations are not satisfactorily accurate and precise, conservative assumptions must be made.

In practice, *baseline*, *leakage* and *project emissions* must be *overestimated* rather than underestimated. Conversely, *CO_2-fixation* must be *underestimated* rather than overestimated.

The application of this principle is regarded as the best practice, and also *all* scrutinised standards require project developers to rigorously follow this approach for the quantification of their greenhouse gas benefits, as described in the following sections.

4.3.1. A/R CDM

Within the Kyoto market only projects are being accepted that follow the methodologies of A/R CDM, the guidelines of the IPCC[23] and are subject to an approval process of the A/R CDM Executive Board[24]. In combination, these methodologies and guidance provide comprehensive description for the determination and quantification of the different calculative parameters.

[23] http://www.ipcc-nggip.iges.or.jp/public/index.html

[24] The Executive Board supervises the CDM under the authority of the United Nations Framework Convention on Climate Change (UNFCCC)

By October 2008, the Executive Board of the A/R CDM has accepted 10 methodologies[25], 1 *consolidated* methodology and 3 simplified *small-scale* methodologies that are listed in table 5 below.

Table 5: A/R CDM methodologies

A/R CDM Methodologies	
Approved Large Scale Methodologies[26]	
AR-AM0001	Reforestation of degraded land - Version 2
AR-AM0002	Restoration of degraded lands through afforestation/reforestation - Version 1
AR-AM0003	Afforestation and reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing - Version 3
AR-AM0004	Reforestation or afforestation of land currently under agricultural use - Version 2
AR-AM0005	Afforestation and reforestation project activities implemented for industrial and/or commercial uses - Version 1
AR-AM0006	Afforestation/Reforestation with Trees Supported by Shrubs on Degraded Land - Version 1
AR-AM0007	Afforestation and Reforestation of Land Currently Under Agricultural or Pastoral Use - Version 2
AR-AM0008	Afforestation or reforestation on degraded land for sustainable wood production - Version 2
AR-AM0009	Afforestation or reforestation on degraded land allowing for silvopastoral activities - Version 2
AR-AM00010	Afforestation and reforestation project activities implemented on unmanaged grassland in reserve/protected areas - Version 2
Consolidated	
AR-ACM0001	Afforestation and reforestation of degraded land - Version 1
Approved small scale A/R methodologies[27]	
AR-AMS0001	Simplified baseline and monitoring methodologies for small-scale afforestation and reforestation project activities under the clean development mechanism implemented on grasslands or croplands
AR-AMS0002	Simplified baseline and monitoring methodologies for small-scale afforestation and reforestation project activities under the CDM implemented on settlements
AR-AMS0003	Simplified baseline and monitoring methodology for small scale CDM afforestation and reforestation project activities implemented on wetlands

In the following sections, the current accepted A/R CDM methodologies are summarised and subsequently the methodological approaches of each standard are scrutinised.

Baseline

As aforementioned in the chapter additionality, A/R CDM projects are required to determine at least one plausible 'without-project scenario' besides the 'project scenario'. Thereby, the without-project scenario is used as a *reference* to determine the so-called baseline emissions.

Depending on the methodology applied, project developers must follow either a *stationary* or an *adaptive* approach (table 6).

- The *stationary* approach assumes that the baseline emissions stay constant, resulting in a 'frozen' baseline over the entire project lifetime. This approach is used by 9 of 10 A/R CDM methodologies.

[25] http://cdm.unfccc.int/methodologies/ARmethodologies/index.html
[26] http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html
[27] http://cdm.unfccc.int/methodologies/SSCmethodologies/SSCAR/approved.html

- The *adaptive* approach takes into consideration that emissions and emission reductions of the without-project scenario would increase or decrease over time. Using this approach, the baseline has to be monitored and continuously adapted over project's lifetime.

Table 6: A/R CDM baseline approaches

A/R CDM methodology	AR-AM0001	AR-AM0002	AR-AM0003	AR-AM0004	AR-AM0005	AR-AM0006	AR-AM0007	AR-AM0008	AR-AM0009	AR-AM0010
Baseline options	✓	✓	✓	✓	✓	✓	✓	✓	✓	o

✓ = stationary baseline approach
o = adaptive baseline approach

Further, all methodologies include comprehensive guidance on *stratification* of the project area, selection of *carbon pools* and *mathematical formula* to determine the amount of baseline emissions.

Leakage

Addressing leakage, project developers must determine all significant greenhouse gas emissions that are caused by the *change of human activities* attributable to project activities outside the project area. Thereby, project developers must again consider all significant *carbon pools* that are likely to decrease due to project activities. Potential leakage effects that must be considered can occur from the following activities:

- Fossil fuel consumption
- Grazing
- Agriculture
- Forage production
- Fuelwood collection
- Displacement of people
- Fencing

Since forestry project *types* vary considerably, and hence leakage effects occur in various ways, the A/R CDM provides for *different methodologies* extensive guidance on how to calculate the emissions due to leakage effects. In table 7 an overview on the different leakage sources are presented that must be considered by the application of the corresponding methodology.

Table 7: A/R CDM leakage sources[28]

A/R CDM Methodology	AR-AM0001	AR-AM0002	AR-AM0003	AR-AM0004	AR-AM0005	AR-AM0006	AR-AM0007	AR-AM0008	AR-AM0009	AR-AM0010
Consumption of fossil fuels	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Activities displacement - Grazing	o	o	✓	✓	✓	o	o	o	o	o
Activities displacement - Agriculture	o	o	o	✓	✓	o	o	o	o	o
Activity displacement - fuelwood collection	o	o	✓	✓	✓	o	✓	o	o	o
Displacement of people	o	o	o	o	o	o	✓	o	o	o
Fencing	o	o	✓	✓	o	o	✓	o	✓	o
Forage production	o	o	o	o	o	✓	o	o	o	o

✓ = to be included in leakage quantifications
o = can be excluded in leakage quantifications

Project emissions

For *all* methodologies, project developers of A/R CDM projects must determine further project greenhouse gas emissions such as N_2O or CH_4, if their sum is *higher* than 5 % of the *total decreases in carbon pools* or *increases in emissions*. Also, project greenhouse gas emissions must be quantified if these are *higher* than 5 % of the *net CO_2-fixation*, whichever is higher. For the quantification, the IPCC guidelines and the A/R CDM tool[29] for testing significance of greenhouse gas emissions must be applied.

Quantification of CO_2-fixation

The different A/R CDM methodologies together with the IPCC guidelines[30] provide comprehensive and rigorous scientifically based guidance to quantify the CO_2-fixation of the established forests. The methodologies also predetermine the *carbon pools* to be considered.

The overview in table 8 presents all carbon pools that must be addressed in accordance with the respective A/R CDM methodology.

[28] Source: TARAM (V1.3) - Tool for Afforestation and Reforestation Approved Methodologies
[29] Tool for testing significance of GHG emissions in A/R CDM project activities (Version 1) - http://cdm.unfccc.int/EB/031/eb31_repan16.pdf
[30] http://www.ipcc-nggip.iges.or.jp/public/index.html

Table 8: A/R CDM carbon pools[31]

A/R CDM Methodology	AR-AM0001	AR-AM0002	AR-AM0003	AR-AM0004	AR-AM0005	AR-AM0006	AR-AM0007	AR-AM0008	AR-AM0009	AR-AM0010
Above-ground biomass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Below-ground biomass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dead wood	o	✓	o	o	o	o	✓	o	✓	o
Litter	o	✓	o	o	o	o	✓	o	✓	o
Soil organic carbon	o	✓	o	o	o	✓	o	o	o	o

✓ = carbon pools have to be quantified
o = carbon pools do not need to be quantified

Monitoring

In general, A/R CDM requires the monitoring of all parameters that are crucial for the quantification of the net greenhouse gas benefits including all emissions and emission reductions calculations. Table 9 shows the preset template which must be used to display all greenhouse emissions and benefits.

Table 9: A/R CDM monitoring plan

Data to be collected or used in order to monitor emissions from …, and how this data will be archived:								
ID number	Data variable	Source of data	Data unit	Measured, calculated, estimated	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment

Source: Matsuo (2004)

4.3.2. Climate, Community & Biodiversity Standards (CCBS)

The CCBA does *not* issue CO_2 certificates, but projects must demonstrate a *net reduction* in greenhouse gas emissions. In order to quantify these, projects developers must follow the *guidelines of the IPCC* or other *CCBA approved methodologies*. In consequence, all approved A/R CDM methodologies as well as the *CarbonFix methodology* and approved *VCS methodologies* can be used in combination with the CCBS.

Baseline

Equally to the A/R CDM principles, the CCBS requires the description of the most likely 'without-project scenario' and the 'project scenario'. In contrast to A/R CDM, the without-project reference scenario must also include a comparison of the likely community development and effects on the biodiversity.

[31] Source: TARAM (V1.3) - Tool for Afforestation and Reforestation Approved Methodologies

Leakage
Similarly to the A/R CDM, project developers must identify all likely impacts outside the project area due to human activities. However, in comparison to the A/R CDM the CCBA use *divergent* leakage *categories* such as:

- Activity shifting
- Displacement
- Market effects
- Increased or decreased investment in the project zone
- Alternative livelihood programmes
- Other leakage causing actions

Project emissions
In accounting for possible project emissions CCBS projects must follow the same approach as the A/R CDM.

Quantification of CO_2-fixation
CCBA requires the application of methodologies that are approved by the A/R CDM Executive Board or other standards, which base their methodologies on the guidelines of the IPCC. In consequence, the CFS, the VCS or other internationally accepted standards may be used. Applying these methodologies, carbon pools must be determined and quantified in accordance with the selected methodologies.

Monitoring
Project developers must design a monitoring plan documenting all measurable indicators that are audited with the validation and the subsequent verification processes. The monitored indicators are compared with future verifications and prove the project's actual positive impacts on the climate, community and biodiversity.

Since monitoring is a costly project component, CCBS projects do not necessarily need to have a complete monitoring plan at the initial stage of the project. However, it must be developed not later than 12 months after the initial project validation.

4.3.3. CarbonFix Standard (CFS)

For the determination of the *baseline*, *leakage*, and *CO_2-fixation* the Technical Board of CarbonFix has developed a simplified methodology based on the *guidelines of the IPCC*. This methodology was developed to quantify the net CO_2-fixation in a practical and rigorous scientific way.

Baseline
In contrast to A/R CDM, CFS does not require a 'without-project scenario'. This approach is being justified by the criteria on the *eligibility* and *additionality* of the standard. Thereby,

- the standard solely allows projects to plant trees on areas where forests have not been *at least 10 years prior to project start*, and
- it requires evidence that *no natural regeneration* of forests would occur without the implementation of projects.

These two prerequisites justify that biomass and hence CO_2-fixation will *not* be able to *increase* without a project's implementation.

Further, at the project start the CFS requires project developers to quantify the baseline emissions on the entire project area. This baseline quantity is then being 'frozen' for the entire project lifetime.

For the calculation of the baseline emissions the carbon pools *aboveground* and *belowground biomass* must be considered. The CFS has published guidelines[32] describing how to conduct inventories in order to determine these carbon pools.

Leakage

For the identification of leakage the CFS uses six categories that are similar to the A/R CDM. These are:

- Fuelwood use
- Agricultural farming
- Charcoal burning
- Resettlement
- Timber harvesting
- Livestock grazing

For each of these six categories the CFS provides a detailed calculation method with calculation examples. For the calculation of leakage emissions only the carbon pool *aboveground biomass* must be considered.

Project emissions

CFS certified projects must deduct 0.5 % of the total CO_2-fixation to account for its project emissions. Additionally, projects that use fertiliser must deduct 0.4 tCO_2 per kg of applied nitrogen fertiliser[33].

Quantification of CO_2-fixation

The determination of the CO_2-fixation must be based on accurate and scientifically based forest growth models. The CFS methodology contains two calculative methods to quantify the future CO_2-storage of forests:

1. A method for forests under a selective harvesting regime (a), or for forests that are planted for conservation purposes (b)
2. A method for forests subject to rotation forestry regimes

In case of method 1(a) or 1(b) CO_2-calculation is based on the long-term equilibrium amount of CO_2 that is stored in the forests. Alternatively, in case of rotation forestry, the CO_2-fixation is determined by the mean amount of CO_2 that will be stored in the forest within its first rotation period.

For the quantification of the carbon fixation, the CFS limits the carbon pools to the *aboveground biomass* and *belowground biomass* as table 10 visualises.

Table 10: Carbon pools of the CFS methodology

Carbon Pools		*Examples*	Future CO_2 fixation	Baseline	Leakage
Woody	Aboveground	*Stem, branches and bark*	Selected	Selected	Selected
	Belowground	*Tree roots*		Selected	
Non-woody	Aboveground	*Grass*	Selected	Selected	
	Belowground	*Grassroots*		Selected	
Dead biomass		*Dead branches, trees and litter*			
Soil		*Organic soil*			
Harvested wood (timber and energy wood)		*Furniture, construction material, etc.*			

Source: CarbonFix Standard version 2.1 (2008)

[32] These guidelines can be accessed after creating a login account on the CarbonFix webpage.

[33] http://www.winrock.org/ecosystems/files/Winrock-BioCarbon_Fund_Sourcebook-compressed.pdf (Page 33; Direct N_2O emissions per tCO_2 = 1 kg N * 1.25 * 310 / 1000 = 0.39 tCO_2)

Monitoring
CarbonFix certified projects are obliged to regular monitoring in accordance with the verification time intervals. Hence, monitoring must be conducted initially in a 2-year time interval, followed by 4 years and later every 5 years.

It includes accurate inventories that shape the basis for the control of compliance with the standard and the adaptations of growth models. These inventories must be conducted in accordance with the inventory guideline of CFS using its preset templates.

4.3.4. Plan Vivo System and Standards

The Plan Vivo System and Standards use individual *project-based methodologies* for the determination of the *baseline*, *leakage*, *project emissions*, *CO_2-fixation* and the application of monitoring. For the determination of all parameters Plan Vivo recommends the application of IPCC sources. These parameters are developed by the project developers together with the involved partner organisations as part of the so-called technical specifications. The technical specifications are evidence-based documents developed for each land use system of a project that must be reviewed by the *Technical Advisory Panel* and *approved* by the *Plan Vivo Foundation*.

Baseline
Similarly to A/R CDM, project developers must determine a likely 'without-project scenario' and a 'project scenario'. The without-project scenario includes the quantification of carbon stock levels that actually exist before the project is implemented. In addition to that, socio-economic factors that are likely to influence carbon stock levels must be determined. These are:

- Income levels
- Sources and types of income generating activities
- Sources of energy used
- Levels of education
- Relevant national/regional policies
- Land use and agricultural practices

Leakage
Project developers together with assisting organisations must identify leakage effects on a project-based assessment. These must then be quantified and stated in the technical specifications. In addition, project developers must ensure that project participants do not reduce production below sustainable levels, particularly food production. Land use systems should also consider communities' energy needs ensuring that for example fuelwood production is not displaced.

Quantification of CO_2-fixation
For carbon modelling, Plan Vivo requires assumptions with justifications that consider different ecosystem variables. The modelling must be based on best available scientific backgrounds that have to be clearly referenced. Only the carbon pool *woody biomass* is allowed to be accounted. Any increase of carbon from the pools dead biomass and soil must be excluded.

Monitoring
Project developers must establish a monitoring plan based on indicators identified in the project's technical specifications. Monitoring is carried out for each individual land management plan and results are entered into the project database. These results are

communicated to the Foundation in annual reports which must be approved for a project to continue its Plan Vivo status.

4.3.5. Voluntary Carbon Standard (VCS AFOLU)

Project developers working with the VCS have the choice to apply either *A/R CDM methodologies or VCS approved methodologies*. These VCS methodologies must follow the guidelines of the IPCC and be approved by *two independent VCS accredited auditors*. By October 2008 the VCS had not yet approved methodologies for its Afforestation, Reforestation and Revegetation Program (ARR), and hence *no* VCS methodologies other than A/R CDM methodologies for climate forestation projects exist as yet.

Baseline

Since new methodologies for the ARR Program have not been approved, the baseline determination must be conducted according to one of the A/R CDM methodologies or through the submission of new methodologies that will be subject to the double approval process.

Leakage

Equally to the baseline, the determination of leakage effects must follow the guidance of the A/R CDM as described in chapter 'A/R CDM'.

Project emissions

According to VCS, *significant* emissions due to transportation, the use of machinery and other significant project emissions must be quantified.

Quantification of CO_2-fixation

The quantification of the CO_2-fixation must be conducted in accordance with the IPCC guidance. Alternatively, the VCS Program has set simplified options for the determination of the carbon pool *aboveground biomass*, if projects undertake plantation forestry or natural regeneration practices. Here, the usage of national or regional biomass tables can be applied as follows:

- If plantations exhibit a seedling survival rate of 90 %, regional or national volume or biomass tables may be used applying the *lowest site class*.
- If projects practice natural regeneration, and if regional or national natural regeneration tables are available, these can be applied, also using the lowest site class for the planted tree species.

For both possibilities higher site class yield tables are accepted if a better performance is verifiably demonstrated through measurements. Overall, the quantity of CO_2 certificates can not exceed the long-term average carbon sequestration storage.

Depending on the selected methodology, different carbon pools have to be determined for the different parameters as table 11 demonstrates. Here, *carbon pools* may be excluded if these are in accordance with the principle of the conservative approach.

Table 11: Carbon pools of the VCS

ARR Carbon Pools						
Living Biomass			Dead Organic Matter		Soil	Wood products
Aboveground woody	Aboveground non-woody	Below-ground	Litter	Dead wood		
Y	O/S	Y	O/S	O/S	O/S	O

Y = compulsory carbon pools; O = optional carbon pools; S = to be included if their reduction due to project is significant

Source: VCS AFOLU (2007)

Monitoring

For the monitoring, the VCS Program refers to using exclusively monitoring methodologies of the A/R CDM.

Synopsis

Table 12: Methodological approaches for the determination of carbon credits

Standard	Methodological and scientific approach	New methodologies
A/R CDM	A/R CDM	Approved by A/R CDM Executive Board
CCBS	A/R CDM CFS methodology (IPCC) VCS methodologies (IPCC)	CCBA approved methodologies
CFS	CFS methodology (IPCC)	-
Plan Vivo	A/R CDM Project-based methodologies	Every project
VCS AFOLU	A/R CDM VCS methodologies (IPCC)	VCS approved methodologies

IPCC = These methodologies follow the guidelines of the IPCC

4.4. Permanence

Permanence is one of the *most substantial* issues of climate forestation projects - since these may not only function as carbon sinks, but also as carbon sources. In order to keep forests and the sequestered carbon as *long-term sinks*, it is essential to *sustainably manage* the forests. In consequence, the release of carbon with harvesting must be replaced through replanting or regeneration practices, ensuring the basic principle of sustainable forestry.

Climate forestation projects normally are connected to various risks that must be sufficiently addressed by standards and project developers. Risks can arise from unsecured *finance* or *land tenure* of projects, *natural disasters* such as fires, pests, floods or storms, but also from *political instabilities* of the project host-countries.

Sufficient *management capacities* and clear *land tenure* can reduce the risk to a certain extent. By contrast, *natural hazards* and *political changes* are often not predictable. Certain risks can be minimised by best-practice management, for instance the risk of fire. This risk depends not only on the projects' capacity of management, but also on the relationship to the surrounding neighbours. Therefore, the standards' overall set-up must sufficiently address the *reduction of risks* and the *assurance of permanent forests*.

Even with ideal project management there remains the risk of unexpected detriment of forests. In consequence, the standards must apply systems that *absorb these remaining risks*, and ensure that the potential undesirable release of carbon is being replaced. As recommended by the WWF meta-standard framework (MSF) (2008):

Risk buffer systems that withhold a certain percentage of carbon credits from being sold must be applied by the standards in order to guarantee compensation of potential carbon losses.

The following sections describe the criteria of the standards that were set to *mitigate these risks* and the approaches of *risk buffering*.

4.4.1. Climate, Community & Biodiversity Standards (CCBS)

Mitigation

The CCBS require project developers to identify and mitigate potential risks on the project area, as well as on the surrounded project vicinity. Risks concerning the climate, socio-economic well-being of people, and the environment, affected by project activities must be addressed. The guidance of CCBS requires the consideration of parameters to minimise risks such as:

- Best practice management
- All national laws must be respected
- Land tenure has to be clarified and conflicts resolved before the project start
- Sufficient financial means must be demonstrated
- Measures must be implemented
- Stakeholders must be collaboratively involved in project activities
- People must not be displaced or mistreated

Risk buffer

Since the CCBA recommends applying other standards to issue carbon credits, risk buffering depends on the approaches of the *respective* carbon accounting standards.

4.4.2. CarbonFix Standard (CFS)

Mitigation

The CFS has set criteria requiring project developers to provide evidence that risk is minimised and mitigated. Project developers must attest:

- Best practice management
- All national laws must be respected
- Land tenure has to be clarified and conflicts resolved before the project start
- Sufficient financial means must be demonstrated
- Good relations to neighbourhood
- Fire and pest risk mitigation

Risk buffer
Project developers must *compensate for shortfalls* either by planting additional trees, or by purchasing CO_2 certificates from other certified projects. For the case of project failure, the CFS uses its *buffer fund* that retains 30 % of all projects' CO_2 certificates.

4.4.3. Plan Vivo System and Standards

Mitigation
Plan Vivo projects must *reduce risk* by an *integrated planning process*. All participants have to develop future strategies creating alternative income opportunities and management objectives that are prioritised in accordance to their needs. In addition, a comprehensive risks analysis must be carried out as part of the technical specifications identifying and mitigating risk parameters such as:

- All national laws must be respected
- Land tenure has to be clarified and conflicts resolved before the project start
- Cultural risk must be identified and mitigated
- Stakeholders must be collaboratively involved in project activities
- People must not be displaced or mistreated
- Fire and pest risk mitigation

Furthermore, payments are normally made on a staged basis regulated in the sale agreements of the project participants. These agreements lay out when payments will be made in relation to explicit monitoring dates and targets encouraging project participants to sustain high tree survival rates. Besides the objective of carbon payments, project participants must identify additional management and income objectives for their activities such as timber production or increased agro-forestry productivity.

Risk buffer
If trees die within the project area, these must be replanted. Further, project developers must establish a *risk buffer*. Here, each Plan Vivo project must withhold minimum 10 % of the issued CO_2 certificates. However, the level of this buffer may set at a higher percentage, depending on the annual reporting and advice from the Plan Vivo *Technical Advisory Panel*.

4.4.4. Voluntary Carbon Standard (VCS AFOLU)

Mitigation
The VCS does *not* set detailed criteria on socio-economic or environmental project activities that minimise risks. However, the VCS risk buffer system *financially incentivises* project developers to adopt risk minimisation strategies that are further described.

Risk buffer
The VCS *risk-incentive system* was set-up to motivate project developers to minimise project risks in order to achieve higher amounts of tradable carbon credits. The system requires project developers to assess risks and verify these by two independent auditors during the validation and verification processes - see chapter 'Certification'. The assessment includes the evaluation of the following risk parameters:

- Projects longevity
- Type of ownership
- Management capacity
- Technical capacity
- Financial capacity
- Land tenure
- Future project income and costs
- Future and current opportunity costs
- Political endorsement

As table 13 demonstrates, the risk is thereafter classified in one of the four classes, ranging between 10 and 100 %.

Table 13: Risk buffer range of VCS ARR projects

Risk Class	Buffer Range
Low	10 - 20 %
Medium	20 - 40 %
High	40 - 60 %
Unacceptable	60 - 100 %

Depending on this assessment, the determined percentage of carbon credits is retained in a *buffer account* managed by the VCS. These buffer credits are joined in a buffer portfolio and can be used to compensate for carbon shortfalls or project failure.

Since the risks may vary over time, project developers can reduce the risk percentage as part of the project verification process. If the risk assessment leads to the maintenance or reduction of the risk buffer percentage, a specific percentage of the retained credits is issued, resulting in *additional* tradable credits.

If a project fails to submit an updated verification report to the VCS within 5 years of its latest verification, 50 % of the credits associated with its buffer will be cancelled. After another 5 years, all of its remaining buffer credits will be cancelled. If no subsequent verification has been presented within a period of 15 years, and the crediting period of the project has not yet expired, buffer credits are *cancelled* from the portfolio buffer account to which the project belongs.

Synopsis

Table 14: Permanence insurance approaches of the standards

Standard	Risk buffer	Risk buffer range
CCBS	N/A	N/A
CFS	✓	30 %
Plan Vivo	✓	Minimum 10 %
VCS AFOLU (ARR)	✓	10 - 60 %

4.5. Socio-economic & Environmental Benefits

Social and environmental responsibility has become an increasingly important part of the marketing strategies of large companies. 'More and more companies are adopting policies of environmental sustainability' (Kotler and Armstrong 2006).

'In contrast to regular climate projects *high quality forestation projects* are able to generate CO_2 certificates with far more socio-economic and environmental co-benefits.'

Moriz Vohrer, Chairman of the Technical Board of CarbonFix

Well-managed and sustainable projects are closely associated with a variety of co-benefits, such as the creation of employment, the enhancement of biodiversity, soil and watershed conservation, the provision of wood products and recreational services.

In consequence, it must be guaranteed that projects do not only result in positive climatic

effects, but also generate credible and verifiable positive socio-economic and environmental impacts. In consequence, standards must set strict and applicable criteria to ensure these co-benefits.

4.5.1. Climate, Community & Biodiversity Standards (CCBS)

The CCBA accepts projects that create *significant* socio-economic and environmental benefits. Therefore the CCBA has set the following criteria:

Socio-economic criteria

Project developers who develop a project according to the CCBS must identify communities that are affected by the project activities and describe how they are impacted. The CCBS require projects to address the following parameters:

- Participation of different community groups in project activities
- Capacity building
- Knowledge dissemination
- Creation of employment to locals
- Clear conflict solving and decision-making processes
- Best management practices

CCBS projects must not influence communities harmfully, and mitigation steps must be undertaken in case of negative impacts.

In order to identify impacts and potential adaptation processes a concept must be developed containing the communication procedures of the project management team with communities.

Environmental criteria

Projects must evidence positive environmental and biodiversity impacts. Therefore, the following parameters must be described and evaluated:

- Diversity and threats to species and ecosystems
- Identification and evaluation of High Conservation Value[34] areas
- Identification and evaluation of High Biodiversity Conservation Values[35]

Furthermore, the spread of invasive species must not increase due to direct or indirect project activities, and the use of genetically modified organisms (GMOs) is strictly limited.

Assessment & Monitoring

For the assessment and monitoring of socio-economic and environmental impacts, the CCBS recommends to using a variety of tools, sourced in the Appendices of the Standards. In order to ensure all co-benefits project developers must implement a comprehensive monitoring plan that is *verified in the 5-yearly audits*.

4.5.2. CarbonFix Standard (CFS)

The CFS has set criteria to ensure socio-economic and environmental co-benefits that comply with best practices of *sustainable forest management*.

[34] Assessment of the ecosystem significance considering their conservation value, ecosystem service provision, and social and cultural importance - http://www.hcvnetwork.org/

[35] Protected areas, concentrations of biodiversity, large landscape-level populations, threatened or rare ecosystems, etc.

Socio-economic criteria
CFS requires project developers to have *positive* socio-economic impacts that are ensured by the following aspects:

- Creation of employment
- Capacity building
- Cooperation with projects' neighbourhood
- Work conditions and safety
- Clear conflict solving and decision-making processes

Environmental Criteria
Projects under the CFS framework must evidence positive impacts considering the following environmental parameters:

- Soil
- Water
- Biodiversity

All projects that are verified by the CFS must have at least 10 % *conservation area*. Within this area ecosystems must be treated according to one of the IUCN[36] categories. These vary from *limited management* to *full protection* of the project area.

Further, all planted tree species must be site-adapted and must not be genetically modified (GMOs). The use of non-native species must be justified. Pest management must be documented and conducted in an environmentally friendly way. In addition, animal and plant species of the IUCN red list must be identified and protected.

Assessment & Monitoring
Project developers of CFS projects must document and update all socio-economic and environmental impacts for every verification process. For this, the CFS provides preset templates. These documents are then evaluated in the periodical verifications.

4.5.3. Plan Vivo System and Standards

The Plan Vivo Standards require projects to generate significant positive socio-economic co-benefits to communities. Thereby, communities are directly involved in project activities and social co-benefits are generated from the very nature of projects. Positive environmental co-benefits must be achieved through an *integrative project management*.

Socio-economic criteria
Plan Vivo projects must evidence community benefits through a participatory community approach that contributes to:

- Participation of different community groups in project activities
- Capacity building
- Knowledge dissemination
- Enhancement of communities' living standards
- Improvement of market access
- Impoverishment reduction
- Technology transfer

[36] International Union for Conservation of Nature - http://www.iucn.org

Project developers are responsible for identifying target groups, and appropriately inform them about the Plan Vivo System and the proposed project activities. Through the involvement of local, national and international non-governmental organisations (NGOs) and not-for-profit companies (NFPCs) Plan Vivo projects must annually demonstrate *constant improvement* resulting in enhancement of sustainable development.

Environmental criteria
Projects must create synergistic effects between communities and the mitigation of unsustainable land use such degradation of ecosystems. Further, project activities must positively impact:

- Biodiversity
- Soil stability
- Watershed protection
- Restoration of degraded or degrading ecosystems

Native species that contribute to protection or restoration of ecosystems must be planted. In agro-forestry activities also non-native species may be planted.

Assessment & Monitoring
The co-benefits of Plan Vivo projects must be attested by undertaking socio-economic and environmental impact assessments. These must be conducted by the project developers in cooperation with the involved partner organisations. Evidence of positive project impacts and continuous improvement must be *annually reported* and approved by the Plan Vivo Foundation.

4.5.4. Voluntary Carbon Standard (VCS AFOLU)

The VCS AFOLU Program has constituted a basic framework for the assessment of socio-economic and environmental impacts of a project requiring that *no negative* impacts are generated due to project activities. For generation and evidence of co-benefits the VCS encourages project developers to using other standards such as the CCBS, FSC or the EnCoFOR CDM toolkit.

Socio-economic & Environmental Criteria
According to VCS, project developers seeking verification must identify likely negative socio-economic and environmental impacts and undertake steps to mitigate these.

Assessment Methods & Monitoring
Depending on the applied standards or assessment tools, the methods of monitoring can vary considerably.

Synopsis

Table 15: Socio-economic and environmental Benefits

Standard	Socio-economic benefits	Environmental benefits
CCBS	★★★	★★★
CFS	★★	★★
Plan Vivo	★★★	★★
VCS AFOLU	★	★

★ The stars are set in relation to the standards' criteria. Three stars indicate the highest co-benefits level of standards' whereas one star indicates the lowest co-benefits level

4.6. Certification

In order to generate real and credible carbon credits, projects are subject to certification processes including initial *validation*, periodical *verifications*, *registration* of projects, and *issuance* of carbon credits.

The following sections elaborate on relevant components in respect to certification procedures of projects and creation of carbon credits. These include the procedures of project *validation* and *verifications*, *frequency* of verification, *accreditation* of certifiers, *issuance and registration* of carbon credits, and the *time period* of these procedures.

Validation
During the validation process a so-called *desk review* is normally executed. The desk-review assesses the *completeness* of the projects documentation as well as the *compliance* with the criteria and the applied methodologies of a standard. Also, this process *can* include stakeholder consultations and field visits.

Verification
The verification of projects is periodically conducted *after* a successful validation. Alternatively to the validation process, this procedure normally involves *independent third parties* that verify project documentation by a *field visit*.

It is important to note that both the validation bodies as well as the verification bodies only judge projects according to the criteria of the standards. Hence, it is essential that standards have *strict* and *clear* requirements that unambiguously can be followed by third parties.

Frequency
In general, verifications should be conducted in regular periodic intervals, confirming that the criteria are met over time and that climate benefits are accurately calculated and truly achieved.

Third party accreditation
In order to create real and credible carbon credits, third parties must provide the professional ability to conduct independent and competent verification. Therefore, each standard has so-called accreditation[37] guidelines that set the requirements for third parties seeking to attain acceptance as *certification body*.

Issuance of Carbon Credits and Registration
Normally, *after* a successful validation and verification carbon credits are issued and registered.

Certification time period
The *certification time period* is the term from submitting the project documentation for validation until the issuance of CO_2 certificates. Certainly, this time period depends on the complexity of projects and the quality of projects' documentation. In consequence, the denoted time spans should be considered as an *indicator* only.

[37] Third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tests.

4.6.1. Climate, Community & Biodiversity Standards (CCBS)

The CCBA uses a simple validation and verification approach whereby the association itself is not being involved in the different certification processes.

Validation

For the validation according to CCBS, project documentation must be submitted directly to a CCBA accredited third party auditor. The auditor conducts a *desk-review* of the project documents, as well as a *field visit* and a *stakeholder consultation*.

During the validation process, the CCBA posts the project documentation on its website and provides the public the opportunity to comment on the project. Comments can be submitted for a 30-day period after announcement. These comments are taken into consideration by the auditor who designs a so-called *Draft CCB Validation Report*. This report states which CCBS criteria were met and whether criteria still have to be fulfilled.

The project can only pass the validation and hence achieve CCBA acceptance if non-compliances are implemented at the latest 6 months after the publication of the *Draft CCB Validation Report*. If all criteria are satisfactory, the auditor prepares a *Final CCB Validation Report* and a *Statement of CCBS Compliance*. Both obtain validity for 5 years.

Verification

After a successful CCBS validation the project must be verified within 5 years. The subsequent 5-yearly verification processes are executed in the same manner.

Third party accreditation

The CCBA allows only auditors to verify projects who are accredited as a Designated Operational Entity (DOE)[38] by the CDM Executive Board with an indicative letter for the sectoral scope 'Afforestation and Reforestation', or a Forest Stewardship Council (FSC) accredited certifier. Moreover, the CCBA considers accrediting *additional* independent bodies that sufficiently guarantee competence and credibility.

Frequency

The verification must be conducted every 5 years after the validation, evaluating the actual state and comparing the project with the initial state.

Issuance & registration of carbon credits

The CCBA does not issue carbon credits.

Certification time period

According to the CCBA, the procedure from submitting the project documents until the end of the initial validation process takes on average 2 - 6 months.

4.6.2. CarbonFix Standard (CFS)

The CFS has established a websystem that was designed to create a *user-friendly* procedure for validation and verification. For the explanation on how to use this system the CFS provides so-called *webtutorials*[39] that demonstrate the procedures of uploading the required project information, the validation and verification process, and the procedure of selling CO_2 certificates.

[38] http://cdm.unfccc.int/DOE/scopes.html
[39] http://www.carbonfix.info/Developers/Project_developers

Validation

The validation of CFS projects is conducted by the *Technical Board* of the Association**.** The process takes approximately 1 month and includes a *desk review* that audits the *compliance* of the project documentation with CFS criteria, as well as the *completeness* and the *plausibility* of the documents. Based on this assessment, a *validation report* is produced that summarises the findings and conclusions. Thereafter, the project must be verified within the following 12 months. After a successful validation process, a *project-specific website* goes online. Here, comments can be submitted that are considered in the verification processes.

Verification

For the verification of a project, an accredited third party auditor must confirm that the project is in accordance with the Standard's criteria. Each verification process includes a *desk review* with literature confirmation and a *field visit*. Finally, a *verification report* is compiled by the verification body. If projects do not completely satisfy the criteria of CFS and *minor corrections* are required, project developers must implement these within 6 months.

Third party accreditation

In order to verify projects according to the CFS, independent third parties must be either accredited as DOEs[40] in the field of forestry, or be part of the CFS auditors list[41]. By October 2008, this list includes 8 international forestry certifiers.

Frequency

As table 16 indicates, CarbonFix projects are subject to regular verification intervals that gradually increase from 2 to 5 years, depending on the age of the project. After the 12th year of a project's lifetime, projects must be verified 5-yearly.

Table 16: CFS verification time intervals

Regular verification	Years after project start	Verification time intervals
1st verification	0	-
2nd verification	2	2 years
3rd verification	4	2 years
4th verification	8	4 years
5th verification	12	4 years
6th verification	17	5 years

Issuance & registration of carbon credits

After a successful verification, carbon credits are issued and can be purchased directly from the project developer over the project website *or* from project specific brokers. Every purchase is registered with a unique certificate ID and automatically recorded in the CarbonFix registry.

Certification time period

The time period from the submission of project documentation until the registration is on average 3 - 6 months.

[40] http://cdm.unfccc.int/DOE/list/index.html
[41] http://www.carbonfix.info/Tree_Planters/Certifiers.html

4.6.3. Plan Vivo System and Standards

Plan Vivo projects are validated by the Plan Vivo Foundation, followed by the issuance of CO_2-certificates and the verification process.

Validation

For the validation, the *Technical Advisory Panel* reviews the technical specifications that must be approved by the Plan Vivo Foundation. In addition, the *project design document* must be approved by the *Foundation* showing the *compliance* with the Plan Vivo System and Standards. Complementary, a *field visit* is conducted by an *expert reviewer*. After one annual cycle projects can be *registered* in the Plan Vivo Projects Register which is published on the website, and projects can enter into CO_2 certificate sales contracts.

Verification

The verification process occurs *after* primary sales of CO_2 certificates - by scaling up of carbon finance after 2 or 3 annual Plan Vivo approval cycles. The third party verification proves that systems are actually working including a *field visit*. According to Plan Vivo, projects must have gone through 2 or 3 annual cycles before this process becomes meaningful.

Third party accreditation

Plan Vivo requires third party verifiers to have sufficient expertise within the forestry carbon sector *and* have experience in developing countries. Auditors must be approved by international certification authorities such as the UNFCCC, ISO 14064, CCAR[42], FSC[43] or other forestry certification system accepted by the Plan Vivo Foundation.

Frequency

The Plan Vivo Foundation does *not* prescribe definite verification time intervals. However, it recommends carrying out verification within a frequency of 3 to 5 years, or after significant sales of carbon credits (250 000 tCO_2).

Issuance & registration of carbon credits

After a successful *validation*, projects are registered in the Plan Vivo Projects Register, displayed on their website, and certificates with unique serial numbers are issued. Normally, Plan Vivo Certificates are generated in the end of every year after the approval of the *annual project reports*.

Certification time period

According to the Plan Vivo Foundation, the procedure from submitting project documents until the issuance and registration of CO_2 certificates takes between 3 and 18 months.

[42] http://www.climateregistry.org/
[43] http://www.fsc.org/

4.6.4. Voluntary Carbon Standard (VCS AFOLU)

Projects seeking a VCS certification are subject to the assessment of *two* independent auditors.

Validation

For the validation, project developers select the auditors. These must be accredited by the VCS Program[44]. This body assesses whether the project corresponds with all VCS criteria and prepares a *validation report* in compliance with the VCS template.

Verification

After a successful validation the VCS Secretariat chooses *another* VCS accredited auditor who assesses the *project documentation*, conducts a *field visit* and produces a *verification report* together with a *certification statement*. Thereby, both the validation as well as the verification must follow the norms of ISO 14064-3: 2006[45] or 14065:2007[46].

Third party accreditation

Validation and verification of VCS projects can only be executed by auditors who are accredited as DOEs[47] or Accredited Independent Entities[48] (AIEs). In addition, the VCS considers to approve auditors of the Californian Climate Action Registry (CCAR). For micro projects (less than 5 000 tCO_2 annually), the VCS allows individuals to conduct validation and verification if they meet certain accreditation criteria.

Frequency

The frequency of the verification depends on the project developers. The VCS *encourages* project developers to verify their projects at least every 5 years, and has established a *financial incentive system* (see chapter 'Permanence').

Issuance & registration of carbon credits

For the project registration and issuance of carbon credits project developers must submit the *Project Description* (PD), a *validation* and a *verification report*, a *certification statement*, and the *proof of title* to the registry operator that checks the correctness of the submitted documents.

After satisfactory *documentation* and the *payment* of the fees for the generation of carbon credits, one of the four VCS registries on behalf of the VCS Association issues unique serial numbers to each CO_2 certificate and logs in on the project database. The project database is displayed on the VCS website.

Certification time period

According to the VCS, the average period from submitting the project documents up to the registration and issuance of carbon credits takes approximately 2 - 4 months.

[44] http://www.v-c-s.org/validators.html
[45] http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=38700
[46] http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40685
[47] http://cdm.unfccc.int/DOE/list/index.html
[48] http://ji.unfccc.int/AIEs/List.html

Synopsis

Table 17: Project certification

Standard	Verification time intervals	Accredited third party verification	Time period from submitting documents until the registration
CCBS	5 yearly	✓	2 - 6 months
CFS	2 - 5 yearly	✓	3 - 6 months
Plan Vivo	Recommended 3 - 5 yearly	✓ after issuance of CO_2 certificates	3 - 18 months
VCS AFOLU	5 yearly financial incentive	✓	2 - 4 months

4.7. Costs & Fees of Certification

Project developers seeking certification of their projects with one of the four schemes face costs for the *validation* and *verification processes* that are conducted periodically. In addition, standards that account for CO_2 certificates charge *fees* for the issuance or selling of these. The following sections assemble the certification costs and fees.

4.7.1. Climate, Community & Biodiversity Standards (CCBS)

As the CCBS validation and verification procedures are formally equal, the costs for validation and verification are similar. These costs are charged directly by the auditor and currently expected to range between 5 000 and 40 000 US$, depending on the *size* and *complexity* of the project, *and* whether the auditor is simultaneously validating the project for another carbon accounting standard. The costs occur after the initial validation, and subsequently in each verification procedure at least every 5 years.

Since the CCBA does not issue CO_2 certificates, *no* additional fees occur.

4.7.2. CarbonFix Standard (CFS)

For the initial *validation*, the CFS charges project developers 1 500 € (2 050 US$[49]). The *verification* costs vary among *auditors* and depend of the project *size* and *complexity*. The CFS ranges these costs between 8 000 and 15 000 € (10 900 - 20 500 US$). In case of a combined certification with CCBS, *additional* 2 000 - 5 000 € (2 700 - 6800 US$) must be considered. CFS verification costs occur on a 2 - 5 year basis.

For the issuance of CO_2 certificates, the standard charges 0.50 € (0.68 US$) for every *sold* '$VER_{future}$'.

[49] Exchange rate 10.10.2008, 1 US$ = 0.73156 €, 1 € = 1.36694 US$

4.7.3. Plan Vivo System and Standards

Within the Plan Vivo framework the costs for *validation* range between 5 000 and 12 500 US$. The costs for *verification* are approximated to range between 15 000 and 30 000 US$. Since Plan Vivo recommends conducting verifications every 3 to 5 years, costs will occur periodically depending on the verification intervals.

The *fees* for the CO_2 certificates are 0.30 US$ per *sold* carbon credit.

4.7.4. Voluntary Carbon Standard (VCS AFOLU)

There is *no experience* yet in the validation and verification of VCS climate forestation projects. Consequently, the VCS can not provide accurate estimates on validation and verification. However, it is likely that costs do not vary significantly from those of other standards. Therefore, the VCS ranges these costs between 15 000 and 30 000 US$ for *each* audit, depending on *size* and *complexity* of projects. The periodical VCS verification always includes assessments by *two* independent auditors.

Further, the VCS charges 0.04 US$ for each CO_2 certificate that is generated. The fees are incurred *with the issuance* of the carbon credits when projects are being registered.

Synopsis

Table 18: Costs and fees of certification

Standard	Validation Costs	Verification Costs	Registration Fee
CCBS	5 000 - 40 000 US$	5 000 - 40 000 US$	-
CFS	1 500 € (2 050 US$)	8 000 - 15 000 € (10 900 - 20 500 US$) +CCBS 2 000-5 000 € (2 700 -6 800 US$)	0.50 € (0.68 US$) per *sold* CO_2 certificate
Plan Vivo	5 000 - 10 000 US$	15 000 - 30 000 US$	0.30 US$ per *sold* CO_2 certificate
VCS AFOLU	15 000 - 30 000 US$	15 000 - 30 000 US$	0.04 US$ per *issued* CO_2 certificate

5. State of Project Developers & Climate Forestation Projects

In order to inform *project developers*, *CO_2 buyers* and *other participants* of the voluntary carbon market on the current state of the development of climate forestation projects, the following sections present the outcomes of a *survey* conducted with *project developers* in July 2008.

In the following, results of the standard setters' survey are presented that demonstrate the *numbers* of climate forestation projects that *are*, or *intend* to be certified by the standards.

5.1. Project Developers Survey

Initially, project developers are characterised according to their *experience level* and the *project types* they develop. Subsequently, the *constraints of the A/R CDM* are revealed, followed by an elaboration on the differences between *ex-ante and ex-post* carbon credits. Thereafter, a *trend* is shown on the *participation* level and the *application* of standards by project developers in the voluntary carbon market, followed by components of a *quality forestry carbon standard*. Finally, the *current numbers* of climate forestation projects are presented.

5.1.1. Project developers characterisation

Based on 71 survey participants, 13 % (9) concentrate *solely* on the development of climate forestation projects[50] whereas the remaining 87 % (62) develop *also other* project types as in figure 4 visualised.

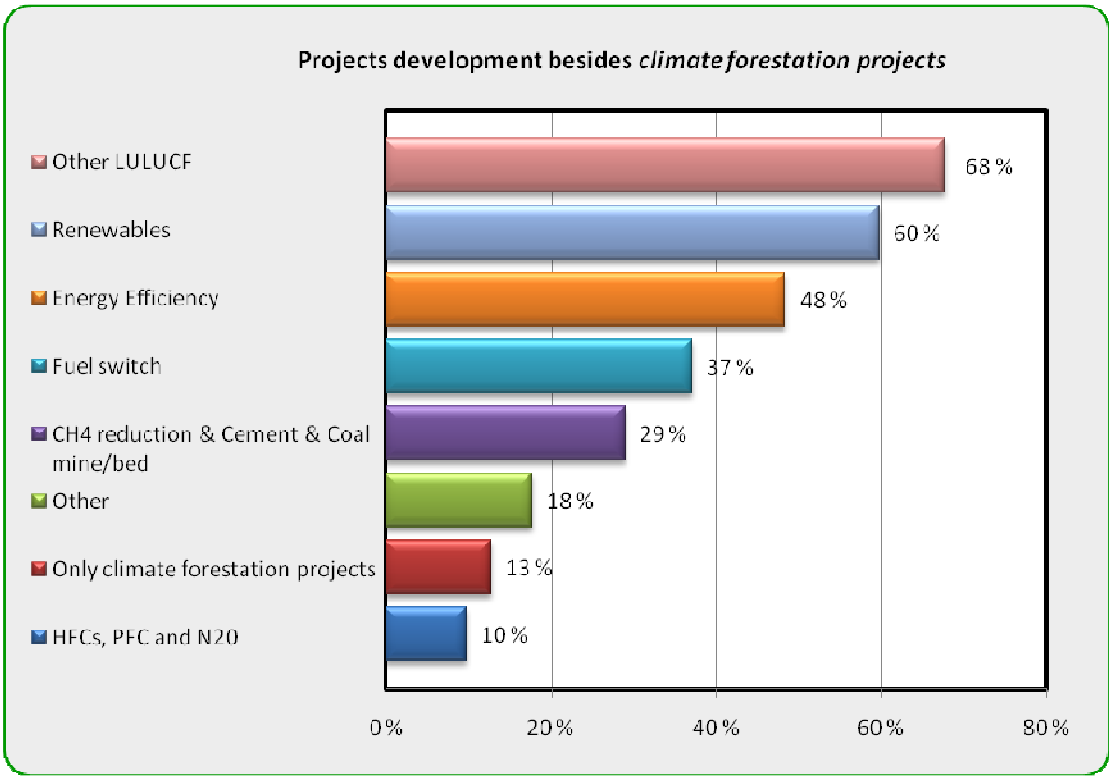


Figure 4: Project development besides climate forestation projects

[50] Afforestation, Reforestation, Agro-forestry, and planted conservation forests

Overall, over half of all respondents (54 %) already have had *experience* with project development using the *A/R CDM* framework. These project developers either have already designed or submitted a PIN[51], a PDD[52] or an A/R CDM methodology.

5.1.2. Constraints of the A/R CDM

Since there is still only 1 certified A/R CDM project globally, project developers who have had experience with A/R CDM project documentation were asked about the most decisive *constraints* of this certification scheme. The questionnaire allowed project developers to rate the decisiveness of each constraint between the ranges one to four, from *not decisive* to *most decisive*.

According to project developers the *most significant* constraints of the A/R CDM are the non-acceptance of all land use, land use change and forestry (LULUCF) projects in the *EU Emission Trading Scheme* (66 %), followed by the *long registration* procedures (63 %), the *complicated methodologies* (52 %) to prove additionality, baseline, leakage, CO_2-quantification and monitoring, and *costs* for project development (52 %) (Figure 5). *Costs* for project registration (42 %) and the generation of *ex-post* carbon credits (40 %) are regarded as less decisive for the failure of A/R CDM.

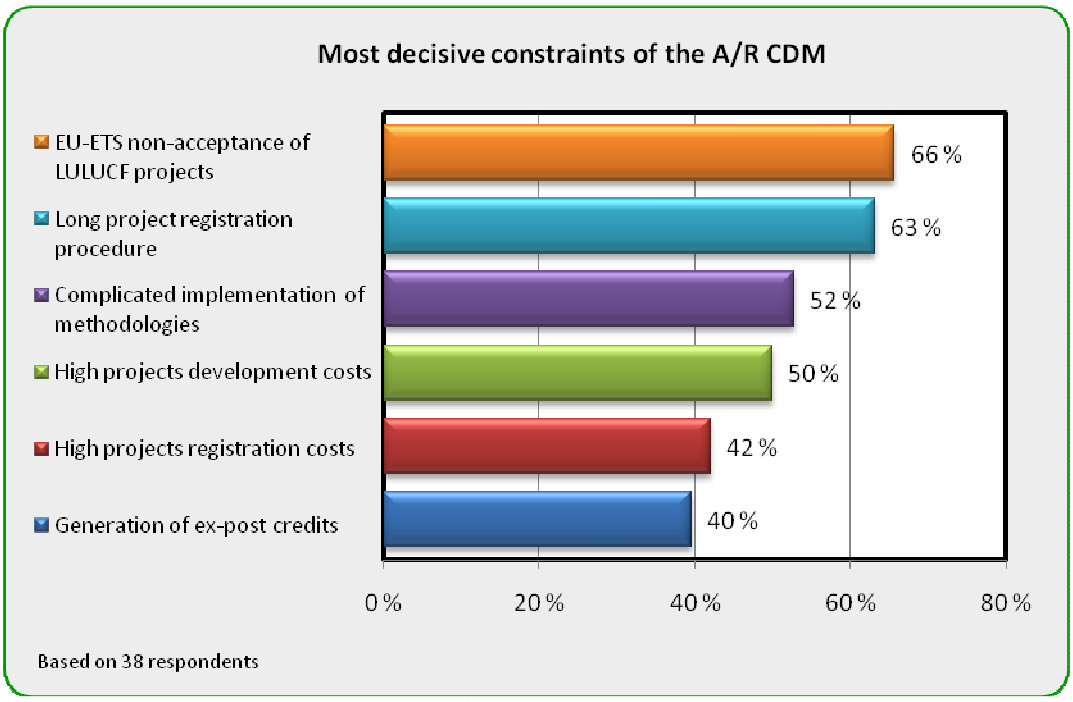


Figure 5: Most decisive constraints of the A/R CDM

5.1.3. Ex-post & Ex-ante Carbon Credits

A *major difference* between the Kyoto market and the voluntary carbon market is that ex-ante credits can be generated in the voluntary market. In contrast to ex-post credits, ex-ante credits account for the *future* CO_2-fixation of the trees. Dependent on the standard, these credits are issued just before or after the trees have been planted.

[51] Project Idea Note
[52] Project Design Document

Since forestation projects normally face the highest costs at the beginning of the project lifetime, it is obvious that additional income from the sale of carbon credits at the initial stage of a project has considerable financial implications.

'While ex-post crediting leads to an increase of the Internal Rate of Return (IRR) by about 2-4 %, ex-ante crediting normally leads to an increase of 8-10 %, depending on the carbon price'.

Matthias Baldus, Expert forestry projects finance, University of Freiburg

According to the project developers survey, only 45 % of the A/R CDM-experienced project developers have a *detailed* understanding of the different financial implications of ex-ante and ex-post crediting approaches. Only 25 % of the *remaining* participants know the financial implications of ex-ante and ex-post crediting.

5.1.4. Application of Forestry Carbon Standards

The participants of the survey were asked to indicate whether they apply, or consider applying carbon accounting standards in the voluntary carbon market. As illustrated in figure 6, 42 % of all project developers *already apply* and 42 % *consider applying* carbon accounting standards. In total, 10 % of the project developers do not intend to work with standards certifying projects *or* do not intend to participate in the voluntary carbon market.

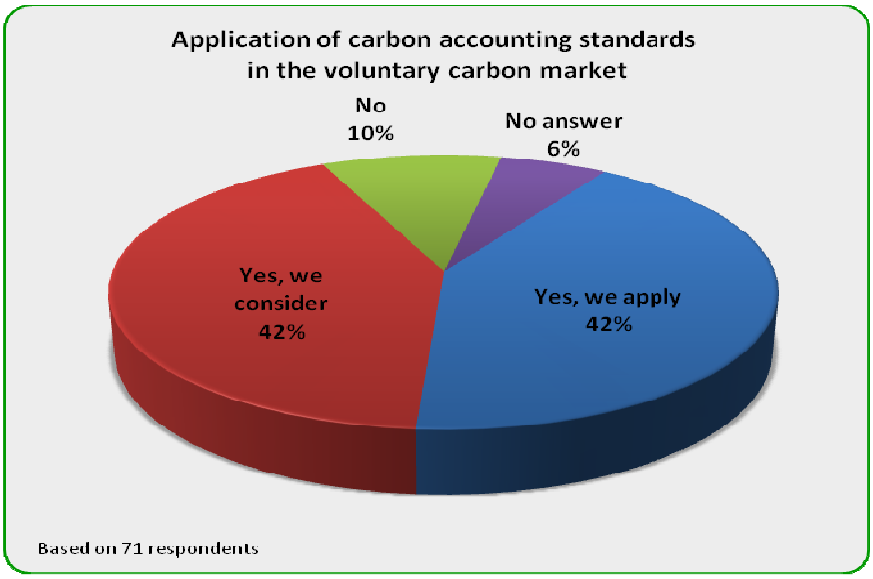


Figure 6: Application of carbon accounting standards in the voluntary carbon market

Figure 7 demonstrates that the CCBS is the best known standard in the market (82%), followed by the VCS (75 %), the CarbonFix Standard (65 %), and Plan VivoSystem and Standards (61 %). Furthermore, the percentage of project developers who have *read* the standards is shown, indicating whether project developers know also the content of the standards.

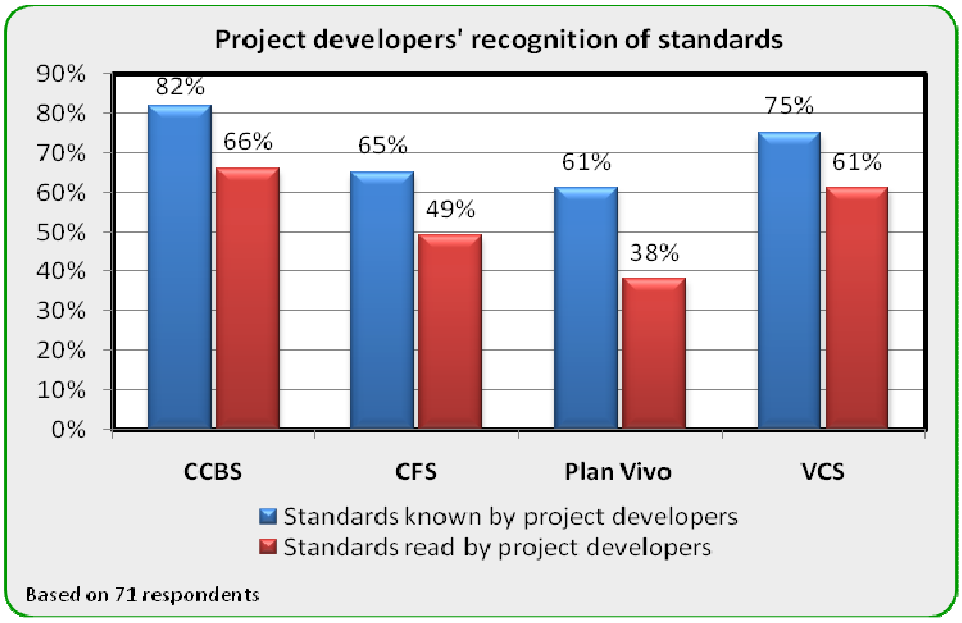


Figure 7: Project developers' recognition of standards

5.1.5. Criteria of a Quality Forestry Carbon Standard

Since standards in the voluntary carbon market are relatively young and are still under development and improvement, public acceptance of the *best standards* will be determined by the *market acceptance* and the level of *standard's application* by project developers.

In this context, project developers were requested to indicate the most important parameters for a *quality forestry carbon standard*. The project developers had the opportunity to rate the importance of different criteria in the range between *not important* to *most important*, using a scale one to four.

As figure 8 visualises, project developers rated *public credibility* of the standards (80.3 %) and the *assurance of permanence* (80.2 %) as the most important components of a standard in the voluntary carbon market. With 78.5 %, the *practicability* of a standard's application is rated as an essential factor as well. Further important parameters of a quality standard are the provision of project *transparency* (73.2 %), the practicability to *quantify CO_2-fixation* (73.2 %), strict criteria ensuring socio-economic and environmental *co-benefits* (71.9 %) and the transparency of *standards' development* (71.8 %).
Standards' *support* to project developers (56.3 %) and *low trading costs* for carbon credits (45.1 %) are regarded as less important.

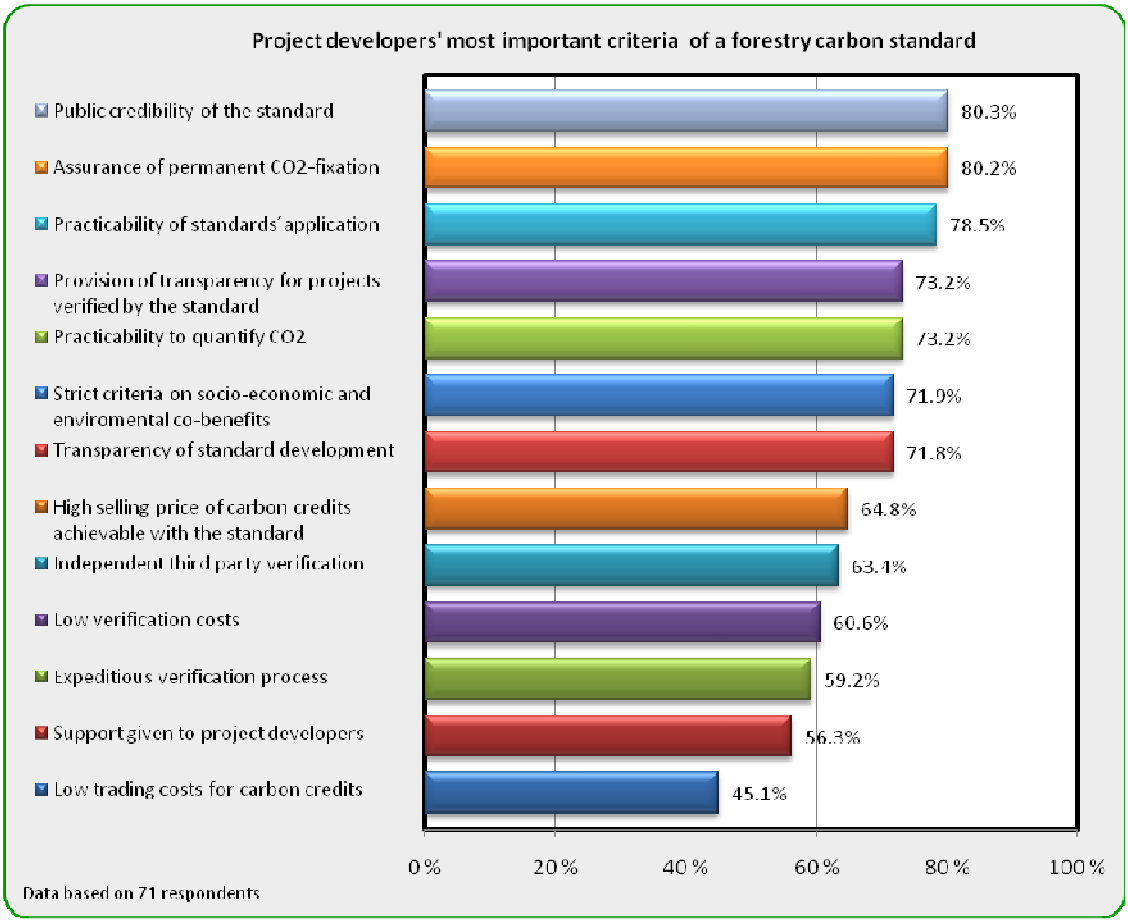


Figure 8: Most important criteria for the selection of a verification standard

5.1.6. State of Climate Forestation Projects

In order to inform the voluntary market participants about the *current state* and the *expectations* of climate forestation project development, participants were asked to provide information on the *quantity*, *location* and average *size* of their climate forestation projects. For this analysis, 64 valid participants were identified for the determination of the 'state of climate forestation projects'. It is important to note that the accounted projects may have been double counted, since often more than one organisation may be involved in project development.

Based on these 64 respondents, about 260 *climate forestation projects* are already developed *or* currently being developed. Figure 9 demonstrates the regional distribution of these projects. More than half of the current projects are located in South/Central America (31 %) and Africa (25 %). The remaining projects are located in Oceania/Australia (16 %), Asia (10 %), North America (10 %) and in Europe (8 %).

In future, the 64 project developers *plan to develop* a further 485 projects. Thereby, the *regional distribution* of the expected projects will be similar to the current situation with *minor changes* (figure 10). The development of projects in *Africa* can be expected to *decrease* (-5 %), whereas the percentage in *South/Central America* will remain *similar* (+1 %). The development of climate forestation projects tends to *significantly shift* to *Asian* (+8 %) countries and also to *European countries* (+6 %), mostly to Eastern Europe.

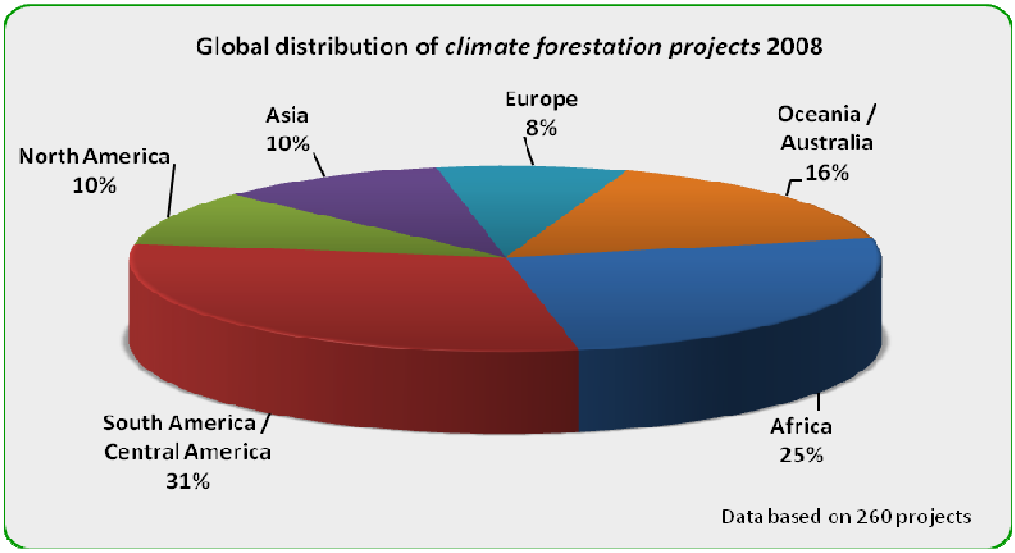


Figure 9: Global distribution of climate forestation projects 2008

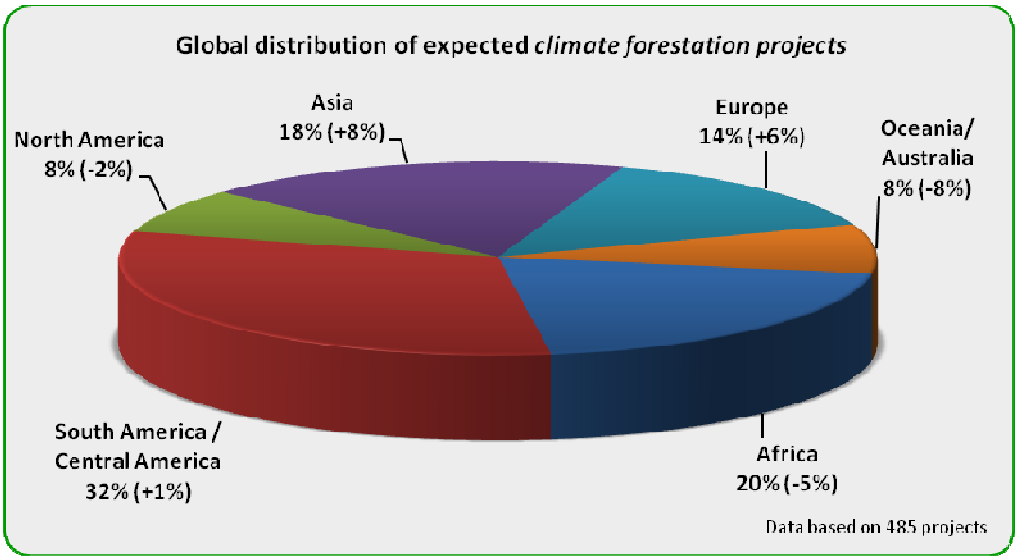


Figure 10: Global distribution of expected development of climate forestation projects

The *size distribution* of the *current* climate forestation projects is shown in figure 11, demonstrating that 39 % of all current projects are large-sized between 1 000 and 10 000 ha. About 18 % are medium-sized (100 - 1 000 ha) and 16 % are small-scale projects (25 - 100 ha). Both, very large projects (> 10 000 ha) as well as micro-scaled projects (< 25 ha) take up a share of 10 % each.

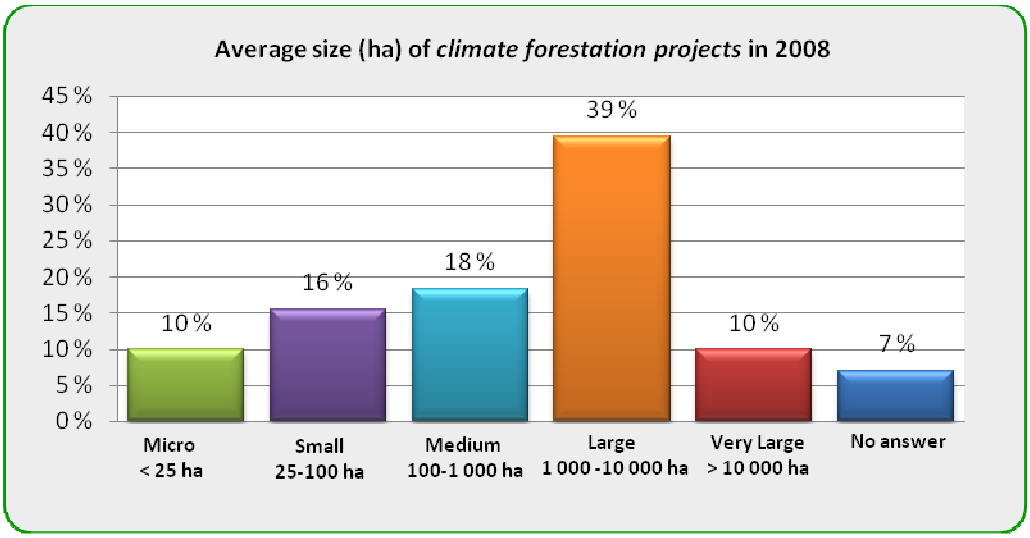


Figure 11: Average size (ha) of climate forestation projects in 2008

5.2. Supply of Climate Forestation Projects and CO_2 Certificates 2009

Also standard setters were asked to provide information on the *number*, *size* and the *geographical distribution* of existing and expected forestation projects.

5.2.1. Climate, Community & Biodiversity Standards (CCBS)

Climate forestation projects

By October 2008, the CCBA has registered 4 climate forestation projects and 8 that are currently being audited. Approximately further 50 projects have expressed their intent to apply the CCB Standards and are in various stages of project development (table 19).

Table 19: State of CCBA climate forestation projects 2008

CCBS		Showing interest	In the pipeline	Registered
Micro	**< 25 ha**	-	-	1
Small	**> 25-100 ha**	-	-	-
Medium	**100-1 000 ha**	5-10	2	3
Large	**1 000-10 000 ha**	20-25	4	-
Very Large	**> 10 000 ha**	15-20	2	-

Figure 12 presents an overview on the global distribution of CCBA projects that intend or already work with the CCBS.

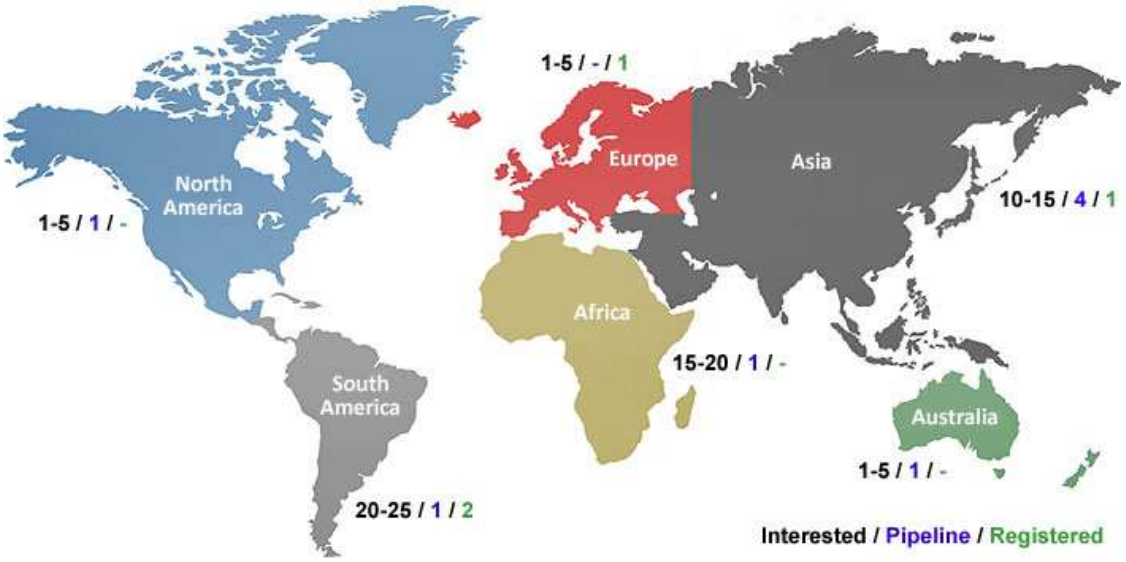


Figure 12: CCBA climate forestation projects by region 2008

5.2.2. CarbonFix Standard (CFS)

Climate forestation projects

In October 2008, the first CFS project has been successfully certified. In the next months, a further 5 climate forestation projects are expected to follow. In addition, more than 25 projects have shown interest to work with the CFS (table 20, figure 12).

Table 20: State of CFS climate forestation projects 2008

CFS	Showing interest	In the pipeline	Registered
Micro < 25 ha	-	-	-
Small > 25-100 ha	1-2	1	-
Medium 100-1 000 ha	10-15	3	-
Large 1 000-10 000 ha	5-10	1	1
Very Large > 10 000 ha	1-2	-	-

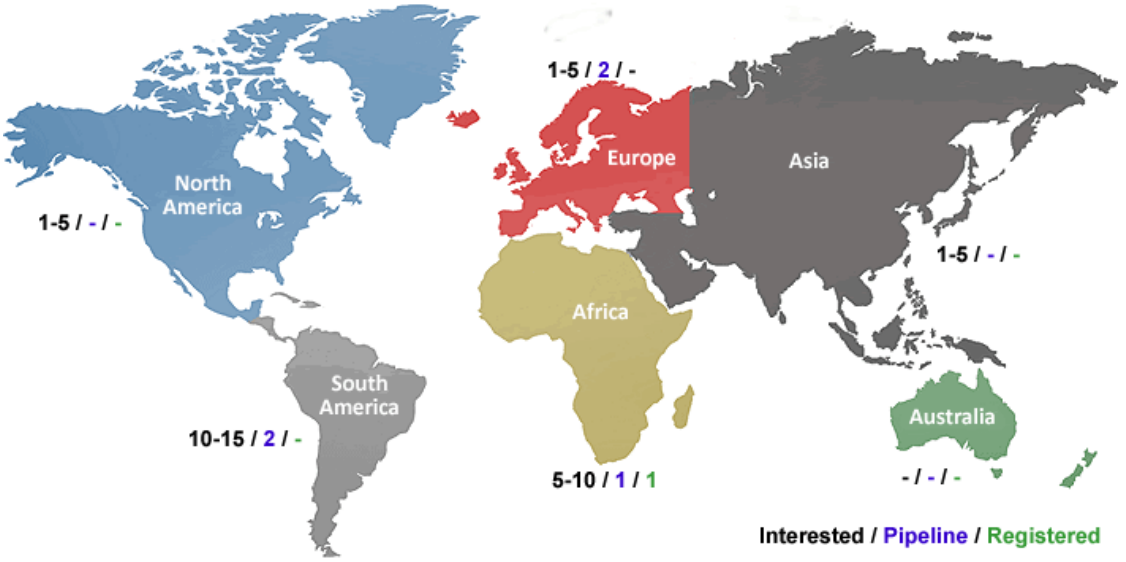


Figure 13: CFS climate forestation projects by region 2008

Expected CO_2 certificates

On average, CarbonFix expects to generate 150 000 CO_2 certificates per project. Regarding the pipeline and projects showing interest, the standard anticipates that about 1.5 million CO_2 certificates will be generated by CFS-certified projects in 2009.

5.2.3. Plan Vivo System and Standards

Climate forestation projects

Currently, 3 climate forestation projects are registered under the Plan Vivo framework. Moreover, 2 projects are in the pipeline, and according to the Plan Vivo Foundation, over 50 projects have shown interest to work with the Plan Vivo Foundation (table 21, figure 14).

Table 21: State of Plan Vivo climate forestation projects 2008

Plan Vivo		Showing interest	In the pipeline	Registered
Micro	**< 25 ha**	-	-	-
Small	**> 25-100 ha**	15-20	-	-
Medium	**100-1 000 ha**	>25	-	-
Large	**1 000-10 000 ha**	10-15	2	3
Very Large	**> 10 000 ha**	5-10	-	-

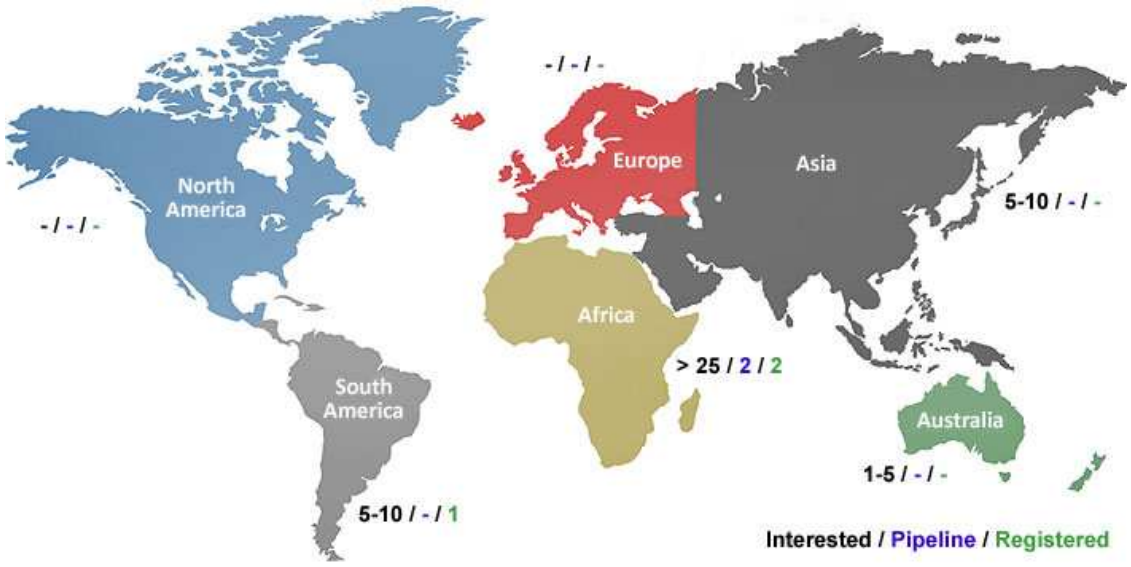


Figure 14: Plan Vivo climate forestation projects by region 2008

Expected CO_2 certificates

Hitherto, within the Plan Vivo framework 550 000 tCO_2 have been transacted from 3 projects, and the Foundation estimates it will accumulate sales of about 3.25 million tCO_2 by 2012. By the end of 2008 the Foundation anticipates to generate a further 160 000 carbon credits, and in 2009 a further 180 000 CO_2 certificates.

5.2.4. Voluntary Carbon Standard (VCS AFOLU)

Climate forestation projects

At present, *no* climate forestation projects have yet been registered or are in the pipeline of the VCS AFOLU Program. According to the standard, about 30 projects have shown interest to work with VCS (table 22, figure 15).

Table 22: State of VCS climate forestation projects 2008

VCS AFOLU		Showing interest	In the pipeline	Registered
Micro	**< 25 ha**	-	-	-
Small	**> 25-100 ha**	-	-	-
Medium	**100-1 000 ha**	5-10	-	-
Large	**1 000-10 000 ha**	10-15	-	-
Very Large	**> 10 000 ha**	10-15	-	-

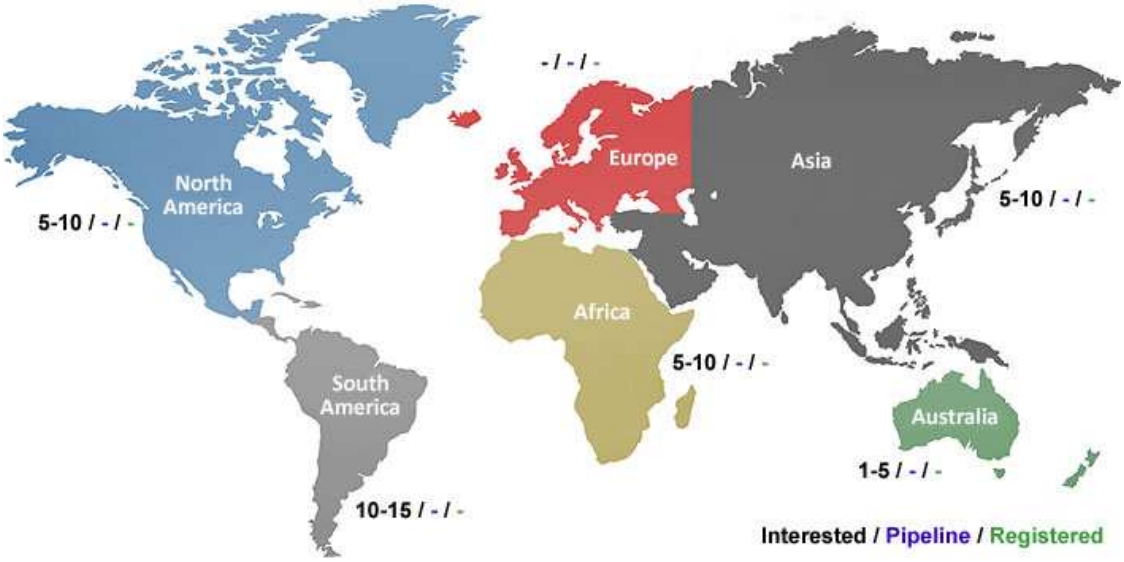


Figure 15: VCS climate forestation projects by region 2008

Expected CO_2 certificates

According to the VCS, 4 million CO_2 certificates are expected for the year 2009. Since there is no separation between REDD *and* ARR (Afforestation, Reforestation, Revegetation) carbon credits, it cannot be predicted how many carbon credits will be generated *only* within the VCS ARR framework, in 2009.

Synopsis

Table 23: Climate forestation projects in the voluntary carbon market

Standard	Interested projects[53]	Projects in the pipeline	Registered Projects	Forestation carbon credits 2009
CCBS	About 50	8	4	-
CFS	About 20	5	1	1.5 mio
Plan Vivo	About 50	2	3	0.2 mio
VCS AFOLU	About 30	-	-	N/A
Sum	**About 150**	**15**	**8**	**2 mio**

Carbon credits of VCS are excluded because a separation of the ARR and REDD Program was not possible

[53] Double counting can not be excluded, since project developers may have shown interest to apply more than one standard.

6. CO_2-Buyers

High quality carbon credits generated by climate forestation projects that are independently verified are becoming increasingly popular to *brokers*, *companies* and *NGOs* extending their portfolios as well as to *individuals*.

For carbon buyers in the voluntary carbon market, it is most important that the credits are *additional*, verified by *independent third parties*, and have significant *socio-economic and environmental benefits* (Hamilton et al. 2008) (Figure 16). Moreover, CO_2-buyers who purchase forestry credits must feel confident that their carbon is *permanently* stored.

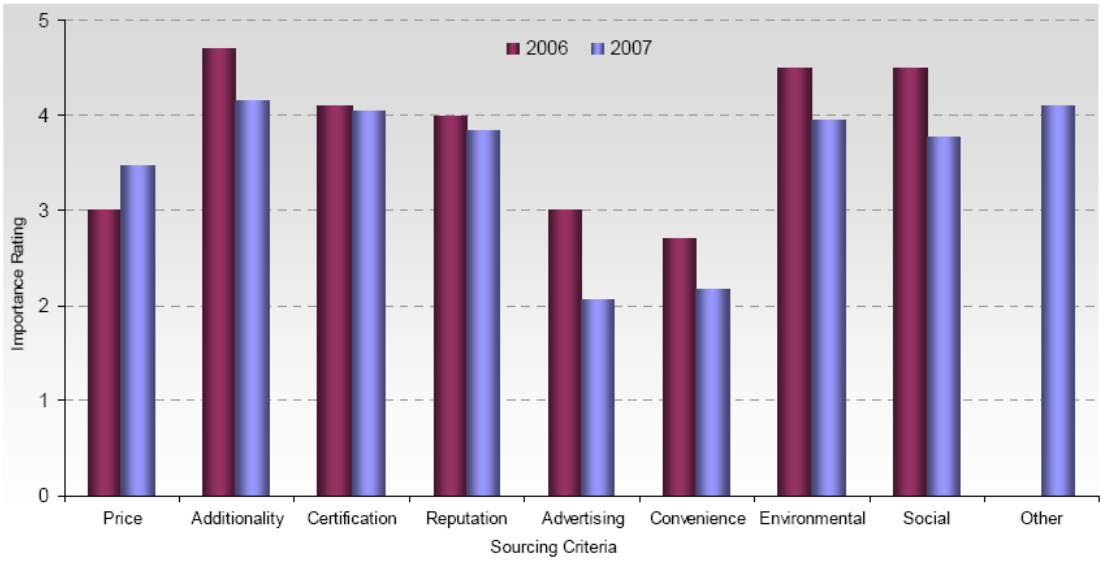


Figure 16: CO_2-buyers' demands when buying carbon credits 2006 and 2007
Source: Ecosystem Marketplace, New Carbon Finance (Hamilton et al. 2008)

With regard to the *variety* of these demands, standard setters as well as project developers are challenged to *enhance* their trustworthiness and *credibility* in the eyes of CO_2-buyers. In consequence, particularly standards must guarantee these fundamental components and empower CO_2-buyers to convince themselves on the value of carbon credits in a *transparent manner*.

The chapter 'Project Developers' elaborated on the additionality, socio-economic and environmental *co-benefits*, and *permanence*, since it is the responsibility of project developers to ensure these components.

With regard to CO_2-buyers, the following sections provide the standards' registries and their approaches to prevent *double counting*, standards' *transparency* provision as well as the opportunities to *purchase CO_2 certificates* and standards' *price* estimates.

6.1. Carbon Registries & Prevention of Double Counting

Since the voluntary carbon market acts in a *fragmented network* without an institution that registers all projects and carbon credits, it is of prime importance to guarantee that project developers sell their carbon credits *once* only. In order to *avoid* 'double-counting', standard setters are responsible to register projects and their CO_2 certificates in *transparent manner*.

For all land use, land use change and forestry projects (LULUCF) another possibility of double counting arises due to Article 3.4[54] of the Kyoto Protocol. When a host-country is an Annex I country, credits from land use changes must be accounted within the national carbon registry. In order to avoid that climate benefits are accounted within the Kyoto market as well as in the voluntary carbon market, projects should ensure that their carbon credits are not accounted in the national carbon registry and in other voluntary carbon market registries.

In the following sections, *standards' registries* and their approaches to prevent double counting are described.

6.1.1. Climate, Community & Biodiversity Standards (CCBS)

Registry & Double Counting

Although the CCBA does not issue CO_2 certificates, it requires that carbon credits generated by a standard in combination with the CCBS are documented, and that double counting is prevented.

6.1.2. CarbonFix Standard (CFS)

Registry & Double Counting

The CarbonFix Standard registers projects and their credits over the CarbonFix websystem. Thereby, all carbon credits sold by a project are automatically registered receiving a unique certificate ID. These IDs can be used by CO_2-buyers to trace the exact location of planted forests via the internet.

In case projects are implemented in countries that are subject to Article 3.4 of the Kyoto Protocol (Annex I countries), CarbonFix reports the respective project area to the DNA[55] of the project host countries.

[54] Prior to the first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol, each Party included in Annex I shall provide, for consideration by the Subsidiary Body for Scientific and Technological Advice, data to establish its level of carbon stocks in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how, and which, additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I, taking into account uncertainties, transparency in reporting, verifiability, the methodological work of the Intergovernmental Panel on Climate Change, the advice provided by the Subsidiary Body for Scientific and Technological Advice in accordance with Article 5 and the decisions of the Conference of the Parties. Such a decision shall apply in the second and subsequent commitment periods. A Party may choose to apply such a decision on these additional human-induced activities for its first commitment period, provided that these activities have taken place since 1990.
http://unfccc.int/resource/docs/convkp/kpeng.pdf

[55] Designated National Authority, http://cdm.unfccc.int/DNA/index.html

6.1.3. Plan Vivo System and Standards

Registry & Double Counting

The Plan Vivo Foundation uses its own registry. It prevents double counting by assigning unique serial numbers to each issued certificate and displays all sales, together with their buyers on its website[56].

The Plan Vivo Foundation plans to develop an interactive online registry held by an independent provider.

6.1.4. Voluntary Carbon Standard (VCS AFOLU)

Registry & Double Counting

The VCS Association applies a multiple registry approach using four registries: Caisse des Depots, TZ1, Bank of New York Mellon (BNYM), and APX Inc. *Each* registry is permitted to issue carbon credits from VCS certified projects by assigning a unique serial number to each certificate. The four registries hold each other's assets and if changes or transactions occur it is recorded in each registry.

At present the APX Inc. is developing the project database that is expected to be displayed on VCS the website[57] in October 2008.

Synopsis

Table 24: Standards' registries

Standard	Registries
CCBS	-
CFS	Online registry
Plan Vivo	Online registry
VCS	APX Inc., Caisse de Depots, TZ1, The Bank of New York Mellon

6.2. Transparency

As carbon dioxide is a product that is *neither tangible nor visible*, it is important to communicate how and where the carbon has been fixed in a *transparent* and easy understood manner providing real and publicly available information.

In contrast to non-forestry projects, forestry projects have the advantage that the absorbed carbon is clearly visible and climate benefits are easier to understand by the public.

Since companies often utilise CO_2 certificates to communicate their *Corporate Social Responsibility* (CSR) climate forestation projects must be communicated in an adequate *customer-orientated* manner. However, registered projects of the standards have hitherto only informed CO_2-buyers in a simple form of long technical papers deterring rather than

[56] http://www.planvivo.org/fx.planvivo/scheme/buyerregister.aspx
[57] http://www.v-c-s.org/projects.html

attracting customers. In order to enhance the *confidence* and the *attractiveness* of climate forestation projects, standards must adopt strategies that *adequately communicate* their overall benefits.

The following sections summarise the approaches of the standards to provide *transparent project information* to the public and to CO_2-buyers; thereby the provision of project information on the *websites* and the level of *public involvement* in project activities are demonstrated.

6.2.1. Climate, Community & Biodiversity Standards (CCBS)

Project information

On the website[58] of CCBA, registered projects and those under validation are displayed, delivering the following information to the public:

- Project name and location
- Project documentation
- Validation and verification reports
- Public comments
- Name of certifier
- Status of certification

Public involvement

During the validation process, Project Design Documents (PDDs) are made publicly available and can be commented for a *30 day period*. The comments are displayed on the webpage and must be considered while projects are validated.

6.2.1. CarbonFix Standard (CFS)

Project information

On the CarbonFix website each project gets its own webpage[59]. Here, the following project information is displayed:

- Project name and location
- Project documentation (split into brief documents and attachments)
- Validation and verification reports
- Public comments
- Name and contact of certifier
- Status of certification
- News from project developers
- Project maps
- Project pictures
- Google map function

In addition to the project information, projects developers can use this website as a platform to *sell their CO_2 certificates* and to *register brokers*. Only carbon buyers who seek to purchase *smaller quantities* can purchase through the website.

Furthermore, carbon buyers have the possibility to use a so-called *product-tracing system*. This system allows CO_2-buyers to split their CO_2 certificates into smaller credits with a *unique*

[58] http://www.climate-standards.org/projects/index.html (24.05.2008)
[59] http://www.carbonfix.info/Project.html

code. This code can then be printed on a product. This allows also customers to *trace* the *climate-neutrality* of a certain product.

Public involvement
Subject to the validation, each project gets its *own webpage*. Here, public comments can be submitted at *any time* and will be considered in the following verification processes. In addition, all CFS project developers provide a description on how to visit their projects, encouraging the public to judge the quality of projects by themselves.

6.2.3. Plan Vivo System and Standards

Project information
The Plan Vivo Foundation provides numerous sources of information on its *website*[60]. These include a *general* and *project specific* documents library. The *general library* displays various technical papers and documents elaborating on the background of Plan Vivo Systems and Standards and climate forestry. The *project specific libraries* include:

- Project name and location
- Project documentation (technical specifications, approved annual reports)
- Validation and verification reports
- Project pictures
- Technical documents
- Various presentations
- Public information and press publications

Public involvement
The Plan Vivo Foundation considers the *participation of communities* that design project activities and recognise the need and benefits of the project.

Currently, the Foundation is updating its website which will include *comment fields* for the public. Furthermore, the Plan Vivo Foundation holds an annual stakeholder meeting that is attended by NGOs, verifiers, resellers and other interested parties.

6.2.4. Voluntary Carbon Standard (VCS AFOLU)

Project information
The registries of the VCS are *currently developing* the project database[61] of the VCS that will display all verified VCS' projects. The database will include at least the following information:

- Project name and location
- Project documentation
- Validation and verification reports

Public involvement
During the validation and verification stages the VCS *encourages* projects to execute public consultations. Further participation is *not* considered under the VCS framework.

[60] http://www.planvivo.org/fx.planvivo/scheme/documents.aspx
[61] http://www.v-c-s.org/projects.html

Synopsis

Table 25: Standards' transparency

Standard	Online display of project information relevant to CO_2-buyers	Public involvement
CCBS	★	30 days during validation
CFS	★★★	Permanent public comments through the projects website
Plan Vivo	★★	Participation of communities and annual stakeholder meeting
VCS AFOLU	★	Recommended public consultation

★ The stars are set in relation to the standards. Three stars indicate the highest level of transparency whereas none stars indicate no project information available to the public and CO_2-buyers.

6.3. Purchase & Prices of CO_2 Certificates

This section provides information to CO_2-buyers on the *possibilities to purchase* CO_2 certificates and the *prices* standard setters anticipate for carbon credits generated by their climate forestation projects in 2009.

6.3.1. Climate, Community & Biodiversity Standards (CCBS)

The CCBS is used in combination with others standards ensuring a *premium quality* of carbon credits. Therefore, certificates from projects that are ancillary certified by the CCBA are expected to receive a *premium price*.

6.3.2. CarbonFix Standard (CFS)

Purchase

Carbon credits, so called *$VER_{futures}$*[62] that are verified and registered by the CFS can be purchased either *directly over the webpage*[63] of the project developer or from a *registered broker*. Registered brokers are displayed on projects' webpages.

Brokers can apply to become registered as official retailers with special purchase conditions also through the websystem of CarbonFix.

As mentioned above, all CO_2-buyers will be able to make use of the *code function* which allows to split CO_2 certificates into smaller units with a *unique ID* (e.g. UK-BOTTLE-0234). This ID can then be *printed on a product* allowing end-consumers to *trace* their product to the location where the planted trees are growing.

Prices

In 2009, the CFS expects a *price range* of 10 - 20 € (14 - 27 US$) per tCO_2. According to the standard the price normally depends on the *volume* of sales, the *marketing* efforts of the project developers, and the *availability* of certificates.

[62] Voluntary Emission Reductions - futures
[63] http://www.carbonfix.info/Project.html

For CFS projects that are certified in combination with the CCBS, CarbonFix anticipates prices in the upper range.

6.3.3. Plan Vivo System and Standards

Purchase

CO_2 certificates, so called *Plan Vivo Certificates*, can be either purchased *directly* from the project developers or from *resellers* that are registered and displayed on the website of Plan Vivo. In addition, a Plan Vivo ESCROW facility can be used to purchase Plan Vivo Certificates providing advice to projects. CO_2-buyers can also contact projects developers directly and enter into contracts.

Purchasers seeking to resell Plan Vivo Certificates must be registered by the Plan Vivo Foundation subject to an agreement of a Code of Good Practice, setting the trading framework.

Prices

In 2009, the Plan Vivo Foundation expects a price *range* of 8 - 30 US$ per tCO_2.

6.3.4. Voluntary Carbon Standard (VCS AFOLU)

Purchase

The VCS Program provides the opportunities to CO_2-buyers to purchase CO_2 certificates, so called *Voluntary Carbon Units* (VCUs), *directly* from project developers or from *brokers*.

Prices

The VCS anticipates a price *range* of 12 - 18 US$ per tCO_2 in 2009.

Synopsis

Table 26: Pricing of CO_2 certificates

Standard	Expected CO_2-certificates prices in 2009
CCBS	Premium prices
CFS	10 - 20 € (14 - 27 US$)
Plan Vivo	8 - 30 US$
VCS AFOLU	12 - 18 US$

CFS and Plan Vivo estimates for ex-ante carbon credits; VCS estimates for ex-post carbon credits

7. Summary

This chapter constitutes a brief summary of each standard with regard to *project developers* and *CO_2-buyers*.

7.1. Climate, Community & Biodiversity Standards (CCBS)

The CCBA certification guarantees the highest level of socio-economic and environmental *co-benefits* in the market.

In order to generate carbon credits from CCBA-certified projects, *ancillary* carbon accounting standards *must* be applied. The CCB Standards provide project developers *clear* guidance with a high level of flexibility. Projects certified in combination with a carbon accounting standard such as CFS or VCS are likely to achieve significantly higher prices for their certificates due to *high level of co-benefits*.

Regarding CCBA's current forestation projects, the standard has made important experiences, mostly with *medium* to *very large* scale projects (> 1000 ha) and is growing rapidly. Particularly, *if* project developers start using the CCBS in combination with a carbon accounting standard, the standard can be a substantial component of climate forestation project certification ensuring co-benefits and sustainable development.

7.2. CarbonFix Standard (CFS)

The CFS guarantees high quality carbon credits from *sustainably managed* climate forestation projects.

With *clear* guidelines, easily *applicable* templates and its *extensive websystem*, CarbonFix has created a *high quality* standard with an innovative and *developer-friendly* project preparation interface.

CO_2-buyers receive *transparent* and visibly *traceable* carbon credits and have consumer-oriented *opportunities to market* and communicate their climate change mitigation efforts.

In regard to the age of the Standard whose first version was released in December 2007, it has started to grow rapidly. Furthermore, the fact that CFS solely focuses on certification of climate forestation projects, the standard shows a great potential for *small* to *very large* scale projects (> 100 ha) and will gain substantial experience for continuous improvement and hence increase the effectiveness of forestation projects implementation.

7.3. Plan Vivo System and Standards

The Plan Vivo System and Standards generate carbon credits that enhance sustainable land use by poor *communities in developing countries*.

Beyond the setting of project development standards, the Plan Vivo System and Standards also represent an *integrated management system* assisting the development of community-based *grassroot projects* in cooperation with partner organisations.

CO_2-buyers purchasing Plan Vivo Certificates support rural *communities and farmers* in developing countries that work towards sustainable development *reducing impoverishment* and *ecosystem degradation*.

Regarding the Plan Vivo development since 1994, the Standard has been growing *slowly* but continuously, and will most likely continue to grow.

7.4. Voluntary Carbon Standard (VCS AFOLU)

The VCS ARR Program certifies
ex-post carbon credits *similar to* the *A/R CDM*.

Overall, the structure of the VCS ARR Standard does not provide unambiguous guidance to project developers and is difficult to understand. The VCS AFOLU solely concentrates on the generation of *basic ex-post carbon credits* without focusing on socio-economic and environmental co-benefits.

The validation and verification audits by two independent third parties are likely to cause significantly *higher certification costs* in comparison to other standards, and the fact that additional carbon incomes occur late due to ex-post crediting, make the VCS only attractive for *commercial very large projects* (> 10 000 ha).

Since the VCS ARR Program is *similar* to the A/R CDM that has failed in recent years, it can be expected that *certification* of climate forestation project will be *marginal* in the voluntary carbon market.

Table 27: Summary forestry carbon standards 2008

Standard	CCB Standards	CarbonFix Standard	Plan Vivo System and Standards	Voluntary Carbon Standard (AFOLU)
Background				
Goals	Net positive climate, community and biodiversity benefits	High quality carbon credits from sustainably managed forests	Supply of carbon credits from rural communities in developing countries promoting sustainable development	Creation of credible ex-post carbon credits
Project types	All land-based projects	Projects converting non-forest to forest	Aff./Reforestation, Agro-forestry, IFM, REDD	Aff./Reforest./Reveg., ALM, IFM, REDD
Types of carbon credits	N/A	Ex-ante	Ex-ante & Ex-post	Ex-post
Eligibility				
Project Start Date	No restrictions	11th December 1997	No restrictions	No restrictions
Project Location	Internationally	Internationally	Internationally	Internationally
Additionality				
Testing methods	A/R CDM / CCBA approved methodologies	A/R CDM / Financial analysis	Barrier analysis / Common practice / A/R CDM	A/R CDM / Approved VCS methodologies
Methodologies to determine and quantify CO_2				
Baseline, Leakage, CO_2-Fixation, Monitoring	A/R CDM / CCBA approved methodologies	CFS methodology	Project specific methodologies / A/R CDM	A/R CDM / Approved VCS methodologies
Permanence				
Risk buffer	-	30 %	Minimum 10 %	10 - 60 %
Socio-economic and environmental co-benefits				
Socio-economic benefits	★★★	★★	★★★	★
Environmental benefits	★★★	★★	★★	★
Certification				
Verification intervals	5 yearly	2 - 5 yearly	Recommended 3 - 5 yearly	5 yearly financial incentive
Accredited 3rd parties	✓	✓	✓ after issuance of carbon credits	✓
Certification time period	2 - 6 months	3 - 6 months	3 - 18 months	2 - 4 months
Cost & Fees				
Validation	5 000 - 40 000 US$	1 500 € (2 050 US$)	5 000 - 12 500 US$	15 000 - 30 000 US$
Verification		8 000 - 15 000 € (10 900 - 20 500 US$) +CCBS 2 000 - 5 000 € (2 700-6 800 US$)	15 000 - 30 000 US$	15 000 - 30 000 US$
CO_2 certificates fees	-	0.50 € (0.68 US$) per sold VER	0.30 US$ per sold VER	0.04 US$ per issued VER
Supply of *climate forestation projects* 2009				
Registered projects	5	1	3	-
Projects in the pipeline	8	5	2	-
Carbon Registries & Prevention of double counting				
Carbon registry	-	Online registry	Online registry	APX, Caisse des Depots, TZ1, BNYM
Transparency				
Publicly available project information	★★	★★★	★★	★
CO_2 certificates prices				
Expected tCO_2 prices in 2009	Premium prices	10 - 20 € (14 - 27 US$)	8 - 30 US$	12 - 18 US$

★ The stars are set in relation to the requirements of each standard. The more stars, the higher the transparency and co-benefits level of a standard.

8. Recommendations

In the following sections, recommendations to *project developers*, *CO_2-buyers* and *standard setters* are given that represent the *personal overall impression* of this author's comparison and the project developers survey.

8.1. Project Developers

Despite the fact that 84 % of the *project developers* participating in the survey are already using or consider to apply carbon accounting standards for their projects, the outcomes of the survey show a *lack of knowledge* on the scrutinised standards. Although, most project developers have heard about the different standards, the content and the approaches of these are *not well known*. So it can be *recommended* that project developers of climate forestation projects should *look harder* into the different standards.

Since *all* standards are still being developed and updated, *lack of clarity* still exists. Therefore, it is particularly *recommended* that project developers *contact* the *standard setters* in order to clarify ambiguities. This will deliver standards valuable information for *further improvement* and increase the consciousness of project developers' needs.

Based on the results of the survey and the standards comparison, the author of this paper recommends applying the standards based on the *size* and *type* of climate forestation projects as follows:

- For *micro*, *small* and *medium-scaled* projects (less than 1 000 ha) that work closely with *communities* and have needs of technical and scientific *assistance*, the Plan Vivo System and Standards appears to be the most appropriate Standard. The Plan Vivo System and Standards provide *project developers* valuable *support* throughout a project's lifetime. Advanced and successful projects have the potential to motivate additional community members to participate and significantly *extend the size* of their project areas.

- For climate forestation projects *larger than* 100 ha that focus on *quality management* and *sustainable forestry*, the CarbonFix Standard can be recommended as being the most appropriate. With the issuance of ex-ante carbon credits and the *extensive possibilities* of the CarbonFix websystem, projects have the opportunities to effectively communicate their activities and market their carbon credits.

- Since the VCS ARR Program has not yet certified *any* climate forestation projects a judgment is difficult to make. However, the structure of the standard together with the facts that only ex-post carbon credits are issued and methodologies to determine the CO_2-fixation are very similar to the A/R CDM, the standard is only recommended for *very large commercial* plantations (> 10 000 ha) that face significant barriers.

- Project developers seeking to *demonstrate* a project's *high quality performance* with regard to its significant positive socio-economic and environmental impacts are particularly advised to attain the *ancillary* certification of the Climate, Community and Biodiversity Alliance. The *additional* certification significantly increases the level

of *credibility* and will most likely achieve *premium prices* for CO_2 certificates. In relation to the size of a project, only projects over 1 000 ha seem to be worth the additional procedures and costs of CCBA certification.

8.2. CO_2-Buyers

Dependent on CO_2-buyers' *demands* and *aims* of their purchases, acquisitions of carbon credits can be recommended that are certified by different standards as follows:

- If CO_2-buyers seek to acquire *prime quality* carbon credits with a high level of positive socio-economic and environmental benefits that promote sustainable development, credits that are certified *in combination* with the *CCBS* are most appropriate. These certificates deserve a *premium price*.

- CO_2-buyers aiming to purchase *high quality* carbon credits with innovative *marketing opportunities* can be advised to buy CO_2 certificates from CarbonFix certified projects. Its climate forestation projects are assured to be managed sustainably and to generate socio-economic and environmental *co-benefits.* Moreover, the CFS offers the opportunity to market carbon credits with a *tracing system* that gives companies the possibility to visibly communicate their climate change mitigation efforts.

- CO_2-buyers who aspire to support or even partner with *grassroot community projects* in developing countries promoting sustainable development should buy carbon credits from projects aggregated with the Plan Vivo System and Standards.
  It is important to note that grassroot projects are very *complex* and often extremely *fragmented* that makes the assurance of *permanence* very difficult. Therefore, the communication of project benefits and information of the public appears to be a substantial component before purchasing such carbon credits.

8.3. Standard Setters

In 2007, third party verification standards have become an *essential part* of carbon projects in the voluntary carbon market (Hamilton et al., 2008). With the rapid and innovative market growth, and the significant rise of experience, standards setters are advised to continuously interact with project developers and CO_2-buyers in order to improve their standards and services of their standard.

All standards should undertake further steps to set *clearer* guidelines that are *easier to understand* by project developers.

Since the public *lack knowledge* of how climate benefits are generated and how the voluntary carbon market functions, further steps must be undertaken by *all* standards to increase transparency, providing a better overview on the development process of the standard and its certified projects.

In this regard, the CarbonFix Standard is heading in the right direction providing CO_2-buyers, project developers and other interested parties valuable and interactive information about its procedures and how climate benefits in the voluntary carbon market are composed.

Overall it is recommended to periodically review standards in *close* interaction with experienced project developers who can provide valuable and practical feedback.

Furthermore, standards should seek the evaluation by the meta-standard framework approach (MSF) of the WWF that critically assesses the overall quality of a standard, and thus provides substantial assistance for their continuous improvement and public credibility. The MSF has the potential to develop a benchmark for standards in the certification of high-quality carbon credits from climate forestation projects.

References

Canadell, J. G., and M. R. Raupach. 2008. Managing Forests for Climate Change Mitigation. Science Vol. 320. no. 5882:1456 - 1457.

CarbonFix. 2008. CarbonFix Standard - Version 2.0 Criteria. CarbonFix, Staufen - Germany.

FAO. 2006. Global Forest Resource Assessment 2005 – Progress towards sustainable forest management. Forestry Paper 147, Food and Agriculture Organization of the United Nations, Rome.

Hamilton, C., R. Bayon, G. Turner, and D. Higgins. 2007. State of the Voluntary Carbon Market 2007: Picking up steam. The Ecosystem Marketplace, Washington DC.

Hamilton, K., M. Sjardin, T. Marcello, and G. Xu. 2008. Forging a Frontier: State of the Voluntary Carbon Markets 2008. Ecosystem Marketplace & New Carbon Finance.

Kotler, P., and G. Armstrong. 2006. Principles of Marketing. Prentice Hall, Upper Saddle River, New Jersey.

Matsuo, N. 2004. CDM Methodologies Guidebook. Ministry of the Environment, Japan (MOE), Global Environmental Centre Foundation (GEC).

Nabuurs, G. J., O. Masera, K. Andrasko, P. Benitez-Ponce, R. Boer, M. Dutschke, E. Elsiddig, J. Ford-Robertson, P. Frumhoff, T. Karjalainen, O. Krankina, W. A. Kurz, M. Matsumoto, W. Oyhantcabal, N. H. Ravindranath, M. J. S. Sanchez, and X. Zhang. 2007. Forestry. In Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Pearson, T., S. Walker, and S. Brown. 2008. Sourcebook for Land Us e, Land-Use Change and Forestry Projects. Winrock International, BioCarbon Fund, Arkansas - Massachusetts - Virginia.

Robledo, C., J. Blaser, S. Byrne, and K. Schmidt. 2008. Climate Change and Governance in the Forest Sector: An overview of the issues on forests and climate change with specific consideration of sector governance, tenure and access for local stakeholders. Rights and Resources Initiative. In press.

Voluntary Carbon Standard. 2007. Guidance for Agriculture Forestry and Other Land Use Projects. Voluntary Carbon Standard.

WWF. 2008. Green carbon guidebook. WWF International, Gland - Switzerland.

Appendices

Appendix 1: Organisations that participated in the project developers survey

Project developers survey participants	
A2G carbon partners	Guyra Paraguay
Ardot	IUFRO
Armenia Tree Project	JAADIC Group
Brinkman Forest Restoration Ltd.	Kinomé
Camco	Lambassa ICA BENIN
CantorCO2e	Landcare CarbonSMART
CantorCO2e Brasil	Les Intendants du Madawaska
Carbonfund.org	LG Electronics
Carbono & Bosques	Magnificat Environment Ass
CARE	Mangrove reforestation program
Centre des affaires pour le developement durable	MGAP
Clean Nigeria Environment Group	NTUA, Athens Greece
Clouston Energy Research, LLC	Plantar
Cooperativa Ambio	Precious Woods
Destinee charity foundation	reNew Ltd
DITESAF-University of Padova-Italy	Restore Greem Movement Alliance for Green Schools & Communities
Ecofor LLC	Rights and Resources Initiative
ÉcoRessources Consultants	Rongelap Atoll Local Government
EcoSys - Consultoria e Projetos	Sathyabama University
ECOVIDA	Social Carbon Company
Edinburgh Centre for Carbon Management	Solomon Forest Association Registered Trustees (INC)
EITG	Terra Global Capital, LLC
Emergent Ventures India	The University of Georgia, UGA Costa Rica campus
Emmer Internationaal	The World Bank
First Climate (Switzerland) AG	TIST
FutureCamp GmbH	Trees for Travel
GAI Consultants	UNIQUE forestry consultants
GERES	United Nations Foundation
GFA ENVEST GmbH	Wastekinetics
global-woods AG	West Virginia University
Green Diamond Systems	Wildlands Conservation Trust
Green Resources	Women Leaders in Environment Association
Greenfleet	World Wildlife Fund
Greenoxx NGO	

Published
November 2008 by Carbon Positive - http://www.carbonpositive.net/
'Forestry Carbon Standards 2008' is an independent report by Eduard Merger. Carbon Positive did not commission the report nor contribute to its research but acts as publisher of the report