1

Forests and climate change

Chapter 1: Forests and climate change

This chapter's main objective is to explain the connection between forests and global climate change. The first section briefly explains the science of climate change and the positive and negative impacts it has on forests, natural resources, and people. The second section takes a tour of the forest to see where and how carbon is stored in vegetation and trees.

By the end of this chapter, the reader should know:

- Where and how carbon is stored in forests;
- How forests can help us mitigate and adapt to the impacts of climate change

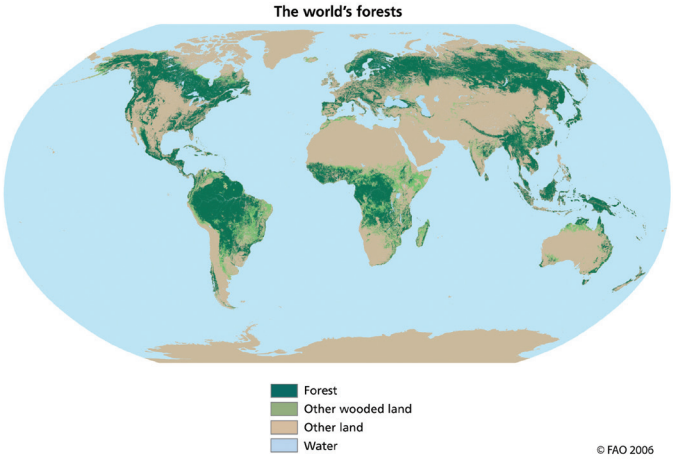


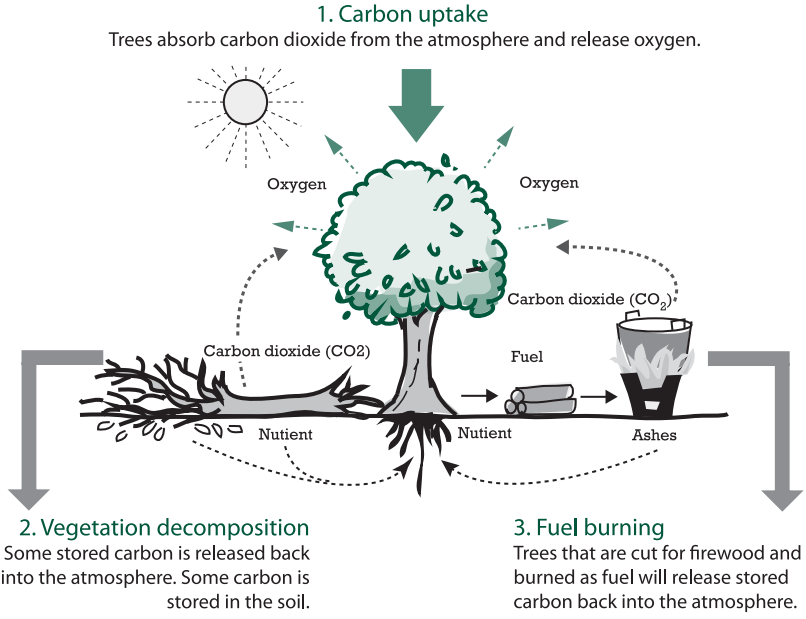
Figure 2: The world's forests.
Source: FAO Global Forest Resource Assessment 2010

Forests play a vital role in combating climate change. Tropical forests cover about 15 percent of the world's land surface and contain about 25 percent of the carbon on the planet's surface (see Figure 2). The loss and degradation of forests accounts for 15 - 20 percent of global carbon emissions. The majority of these emissions are the result of deforestation in the tropics, largely due to conversion of the forest to more lucrative economic activities such as agriculture and mining.

There are plenty of other major sources of emissions, such as industry, energy consumption and transport. However, only forestry activities also have the potential to remove (or ***sequester***) carbon from the atmosphere. This sequestration creates carbon 'sinks'. As well as being potential sources of emissions, forests can also help to mitigate climate change through the creation of additional sinks. Uniquely, forestry practices are a serious part of the climate change problem, but also, potentially, a key part of the solution.

1.1 How do forests store and release carbon?

Trees absorb carbon dioxide (CO_2) from the atmosphere during photosynthesis and store carbon in their stems, branches and roots, which can also transfer carbon to the soil. By removing CO_2 from the atmosphere in this way, forests help to reduce (or mitigate) the severity of climate change (see Figure 3). The different places in which carbon is stored in a forest are known as ***carbon pools*** (see Figure 4).



When a tree is cut down or burned, much of the carbon it stores is released into the atmosphere as CO_2. However, if this material is converted into, for example, furniture or construction timber, the carbon remains stored for as long as these products are in use. Harvested wood products (HWP) are therefore considered an important carbon pool. They include all woody material which leaves the harvest site. HWPs store carbon for varying lengths of time. More and more countries estimate and report on carbon stocks of HWP in their national greenhouse gas (GHG) inventories. But, once cut down, forests and trees stop acting as carbon sinks and become sources of carbon emissions.

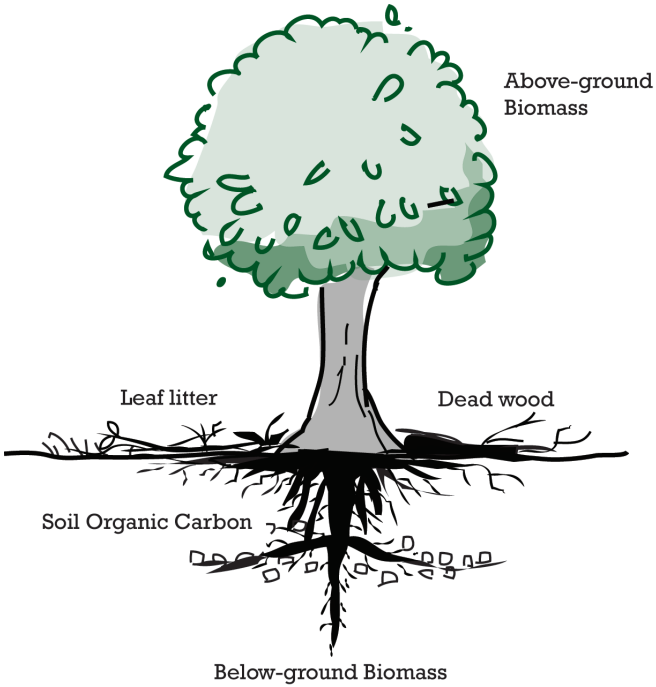


Figure 4: Forest carbon pools

Forest carbon is stored in five places within and around vegetation. These are called carbon pools

1. **Above-ground Biomass:** stems, bark, leaves etc.
2. **Below-ground Biomass:** roots of all sizes
3. **Dead Wood**
4. **Leaf Litter and**
5. **Soil Organic Carbon (SOC)**

Harvested Wood Products (HWP) are considered as a 6th forest carbon pool.

Amended after: TNC 2009 Introductory course on REDD: A training manual

1.2 What are some of the impacts of climate change?

Negative impacts of climate change include the following.

People

Health may suffer if people are exposed to hotter temperatures, have less access to water, and face greater risk of disease.

Livelihoods

Rural livelihoods may be negatively affected by climate change to the point where many households can no longer sustain themselves.

Wildlife

Animals may no longer be able to live in their natural habitat if the temperature rises or water and food is no longer available.

Natural resources

Plants may no longer be able to grow in certain areas. New plants that are able to grow may invade, changing the ecosystem.

Some impacts may also be positive, depending on the circumstances:[9]

1. **Length of growing season:** Warmer temperatures for a longer period of time will increase food productivity in some areas and reduce it in others, depending on water supply and crop adaptability.
2. **Agricultural productivity of land**: Warmer temperatures will make it possible to expand agriculture in northern regions like Russia and Canada, but make some crops, particularly in the tropics, more susceptible to disease and heat stress.
3. **Higher plant productivity**: Increased carbon dioxide levels will increase rates of photosynthesis in many types of plants, which may result in higher yields of certain global crops.
4. **Levels of precipitation**: Climate change is expected to increase annual precipitation in many parts of the world, leading to changes in crop productivity and natural hazards such as flooding and drought.

1.3 How does climate change affect forests?

Climate change can both improve and damage forest conditions. In situations where it negatively affects forests, it also reduces the benefits of forest products and environmental services.

9 UNFCCC. 2002. Climate Change Information Sheet 10: Agriculture and Food Security; Climate Change Information Sheet 13: Water Resources. From *Climate Change Information Kit.* (Available at http://unfccc.int/resource/docs/publications/infokit_2002_en.pdf)

In some areas, decreased rainfall can:

Cause drought, increasing the severity of forest fires.

Reduce overall forest productivity, species diversity and prevent natural regeneration

In other areas, rainfall may increase.

It may be possible to plant and grow trees in areas that have not been forested before.

The forest may become more productive, resulting in increased biodiversity.

In some areas, increasing temperature can:

Cause heat stress, which can kill trees.

Increase the lifespan of forest pests and accelerate the spread of invasive species.

In other areas, decreasing temperature can:

Make it possible to grow new crops, which can be used in agro-forestry systems.

Reduce the risk of forest fire.

1.4 Forests and climate change adaptation

Forest-dependent communities in developing countries are particularly vulnerable to the damaging impacts of climate change, despite being the least responsible. However, with appropriate management strategies, forests can help individuals or communities to adapt to these impacts, and to provide buffers against them.

How do forestry projects help communities to adapt to climate change?

- **Properly designed and implemented forestry projects bring additional financial income to forest-based communities and diversify their livelihoods.** Additional income allows people to take advantage of a wider range of goods and services while a variety of income sources provides insurance against risk. Financial security and insurance increase the capacity to adapt to changing circumstances, climate-induced or otherwise.
- **Responsible carbon stewardship also ensures that forests and their services are sustained and restored.** This enables local communities to continue to use the resources that can provide additional income, such as non-timber forest products, and those that provide for their daily needs, such as food and fuelwood.
- **Forests also shield forest-dependent communities from some of the worst climate change impacts.** For example, coastal forests and mangroves can reduce the impacts of flooding, tsunamis, and typhoons. Forested hillsides can reduce the frequency and severity of landslides.

1.5 Forests and climate change mitigation

What kinds of forestry activities can make a difference?

'Think global, act local' became a slogan of sustainable development initiatives after the Rio Earth Summit of 1992. This means that all efforts matter, no matter how small in scale. One of the most important effects of successful large-scale projects and programmes is the facilitation of individual actions; they make it easier for 'ordinary' people to have a positive impact on the world around them. If enough people make changes in their own lives, we will end up with the significant and sustainable changes that we need at the global scale.

Working together to have an impact

In many developing countries, rural communities look after forests that would otherwise be degraded or removed. An analysis conducted by the Kyoto – Think Global, Act Local (KTGAL) Project[10] found that local forest management was often more effective than centralized management in reducing degradation and enhancing forest carbon stocks. This means that community-based forest management (CBFM or 'community forestry', see Glossary) prevents carbon emissions by reducing the rate of deforestation and degradation, and helping the forest to regenerate.

10 See www.communitycarbonforestry.org for more details of the K-TGAL project

So, local forest managers and forest users can have a significant impact on their local environment. Their actions can help to address climate change by:

- Locking up more carbon in the forest (enhancing the sink capacity);
- Preventing GHG emissions from the forest (avoiding degradation); and
- Ensuring that forests continue to provide the environmental services necessary for forest-dependent communities to sustain their livelihoods and their adaptive capacity.

There are three broad ways in which the forestry sector can help to mitigate climate change:

1. Planting: through afforestation or reforestation;
2. Improving forest management: thus reducing degradation of existing forests; and
3. Avoiding deforestation: preventing the conversion of forests to other land uses.

See section 2.4 for more details and case studies on these approaches. All of them can potentially have additional positive environmental and socio-economic benefits (or ***co-benefits)***, for instance by increasing biodiversity or the income-generating capacity of a community, but the nature and extent of these co-benefits depend on how the activities are implemented, as discussed in section 2.3.

2

VCM project types and standards

Chapter 2: VCM project types and standards

This chapter reviews the specific forestry activities that can help to mitigate climate change and how these activities relate to the forestry VCM. Its objective is to describe the forestry VCM project options, and the basic eligibility requirements under various standards for each project category.

By the end of this chapter, you will know the following:

- The three main forestry VCM project categories: (1) Afforestation, reforestation and re-vegetation (ARR); (2) Improved Forest Management (IFM); and (3) Reducing Emissions from Deforestation and forest Degradation (REDD) and some options for project activities within these categories.
- When you should consider developing a forestry VCM project.
- Details of four standards for certifying emissions reductions of forestry VCM projects and their co-benefits: (1) the Verified Carbon Standard; (2) Climate, Community and Biodiversity Standard; (3) Carbon Fix Standard; and (4) Plan Vivo System and Standards.
- Which project activity is eligible under each standard, and the relevant eligibility criteria that are tested under the various standards (e.g. leakage, permanence and additionality).

Before a project is started, consider the following:

1. What are the possible activities that can be undertaken in a particular location? What are the benefits and drawbacks of each of the options?
2. Does it make sense to pursue certification of the potential project? If so,
3. Which standard would be the right way forward?

2.1 Introducing the types of forestry VCM project

For each of the three main types of climate change mitigation activity through the forest sector, outlined at the end of Chapter 1, there is a recognized category of project under the VCM.

The Verified Carbon Standard (VCS), which will be introduced in more detail in section 2.4, defines these categories as follows:

1. **ARR** – Afforestation, Reforestation and Re-vegetation;
2. **IFM** – Improved Forest Management; and
3. **REDD** – Reducing Emissions from Deforestation and forest Degradation.

The VCS has more categories, but these Guidelines concentrate on forestry options and will therefore not discuss the other categories (e.g. agriculture and peatlands/wetlands) in much detail, though they can involve trees and forests.

For each community, and even for each individual, the development goals driving the choice of forestry activity may be different, including poverty alleviation, biodiversity protection, or the creation and retention of environmental services, or a combination of any of these.

To contribute towards these goals, communities may focus on specific forest management objectives, for example:

- Income generation from forest products;
- Watershed management; or
- Promotion of ecotourism, etc.

The goals and objectives, and their broader impacts, should be defined by the community members directly concerned with forest management as well as all other groups and individuals who will be affected by the activities. The choice of project activity also depends largely on the existing vegetation. For instance, if the area is already covered by forest, but is being constantly degraded due to poor forest management practices, the activities to be implemented will fall under the IFM category.

ARR and REDD are relatively straightforward in terms of defining the activity to be implemented. However, the enabling conditions required to undertake the activities may be quite challenging. IFM projects may take many different forms, as discussed below. However, in all cases, potential project developers must first ask themselves: "Is a forestry project viable?" Regardless of the VCM, forestry must compete with a number of other potential land uses. In some cases, such as government-sanctioned infrastructural developments, the decision is taken out of the hands of the community and the VCM has little relevance. In other cases, different sets of stakeholders may have very different ambitions for the same piece of land, leading to prolonged conflict and social tension. As discussed in Chapter 6, some risks to project development can be identified very early on. Others may become clear only at a later stage.

2.2 Forest management options for climate change mitigation

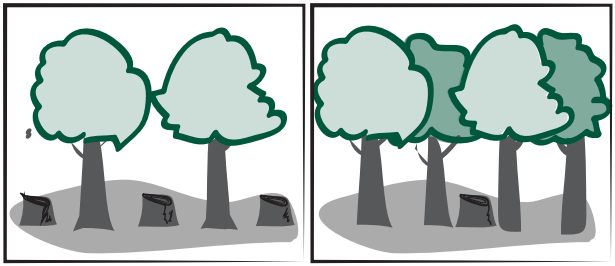
If forestry is indeed a viable activity on the land in question, there are many possible activities that can be undertaken which are relevant to climate change mitigation, as outlined below. The options presented below can take place in any of the three project type categories (ARR, IFM and/or REDD) as all of them can be implemented as soon as there is forest (in case the project is of the REDD or IFM type) or the intent to establish forest (in the case of ARR). Foresters will recognize many of these activities as elementary to the management of healthy forests. Following the general principles of sustainable forest management not only ensures the continued supply of multiple forest products and services, but also results in more efficient carbon sequestration than poorly-managed forests. The impacts of each of the activities for climate change mitigation and adaptation are summarized below, but this list is only a sample of the options available in the forest manager's toolkit.

2.2.1 Consolidate forest area; create a forest management group

Many forest management activities can be a challenge to undertake on your own, particularly if the forest area is small and surrounded by other forest areas over which you have no control. Your best efforts could be undermined by just one neighbor who, for example, does not pay attention to fire control. Forest managers can therefore contribute to effective adaptation and mitigation of climate change by forming groups and agreeing on a set of enforceable forest management rules. Community-based forest management systems are often more effective than individual forest managers at achieving climate change mitigation or adaptation outcomes.

2.2.2 Ensure optimal harvesting times

When trees are harvested, they can no longer continue to absorb CO_2. The dead wood and other material may then emit CO_2 and other GHGs through fire or decay. If you are managing plantations, you can contribute to climate change mitigation by identifying optimal harvesting time according to maximum carbon sequestration (highest growth rates) and optimum economic gain (largest carbon stocks). This optimal point changes once carbon benefits through a VCM project are taken into account. And it changes even more if the carbon that is retained by HWPs is taken into account.



Reducing harvest intensity

2.2.3 Reduce harvest intensity

Leaving more trees standing after a harvest is another way for forest managers to help mitigate climate change. If managing a natural forest, take fewer trees out whenever you harvest. If managing a plantation, consider changing your management system from one in which you harvest all trees in one area at the same time, to one in which you always leave some trees standing; a multi-aged system rather than even-aged. Maintaining a higher and more constant density of trees will also help to reduce soil erosion and may help in local efforts to adapt to climate change.

2.2.4 Keep livestock out of the forest

In many rural areas of the Asia-Pacific region, livestock such as cattle, goats and buffalo graze in natural forests. Their favorite food includes the seedlings of forest tree species and those seedlings that they do not eat are often trampled. Uncontrolled grazing can lead to serious damage to forests because too few seedlings survive to replace mature or harvested trees. Forest managers can therefore contribute to climate change mitigation by keeping grazing livestock out of natural forest areas, particularly from areas where there is abundant natural regeneration. This can be achieved by promoting stall feeding systems for livestock and by cultivating fodder, grass and tree species on farmland.

2.2.5 Create more forests

When people think of the link between forests and climate change, creating more forests is often the first thing that comes to mind. Planting trees on bare land certainly does help mitigate climate change by creating new sinks and increasing carbon stocks. Planting trees on areas that were once forests, but were cleared many years ago, does the same thing. In some cases, the forest may be naturally regenerating already. This makes it easier to achieve the goal of increased carbon stocks – all forest managers have to do is to assist this process by, for instance, keeping cattle out or creating gaps in vegetation to promote the growth of desirable species, and allow the forest to grow.

2.2.6 Plant different species

Planting the same tree species across large areas (monoculture plantations) often makes short-term economic sense but carries long-term environmental (and hence, economic) risks. If a monoculture

forest plantation is affected by disease or pests, the whole plantation may be lost. So, using a mixture of species contributes to climate change mitigation by guarding against large-scale GHG emissions from diseased plantations. Using local species, instead of exotic or alien varieties, will have the same effect; it will strengthen the health and the resilience of the forest. Mixtures of species also help in climate change adaptation by supporting a greater variety of other plants and wildlife (biodiversity) and by ensuring a more constant forest cover due to each species' different harvesting cycle.

Creating diversity in forest structure

2.2.7 Plant and protect vulnerable places

In areas with steep slopes, poor soils or narrow river banks, it is often not possible to get any financial benefits from forest management. These kinds of areas are too expensive or difficult to manage, and yield too little financial returns, and are therefore often cleared or neglected. However, forests in such areas are very important for controlling soil erosion, water quality and for maintaining local livelihoods and wildlife, all of which are important to climate change adaptation and sustaining livelihoods. By protecting or establishing forests in these areas, managers also maintain carbon stocks and contribute to climate change mitigation.

2.2.8 Prevent forest fires

Forest fires release the carbon stored in living trees, and in other carbon pools, straight back into the atmosphere. Forest managers can therefore reduce GHG emissions and contribute to climate change mitigation by reducing the risk of forest fire. For example, this can be done by creating fire breaks, building fire towers and conducting regular forest patrols. This makes sense on all counts: it protects future income from forest products; it protects biodiversity; and it mitigates climate change.

2.2.9 Follow management plans

Most forest managers follow plans, but often they are not very detailed, they may be based on unreliable or inaccurate information, or are simply out of date. Often the old style 'management plans' are better labeled 'harvesting plans' as they do not say much about managing forests between thinning and final felling.

One of the most important aspects of a forest management plan is dividing the forest into separate areas (compartments). This helps to decide what activities should be done in each area over several years, making sure that activities in one part of the forest do not cause problems elsewhere – for example by making sure that two areas next to each other are not harvested at the same time. It also helps to identify which areas need more protection. A good forest management plan will contribute to climate change mitigation by reducing the risk of GHG emissions from fire, disease, pests and over-harvesting. It is important to clearly define and carry out practices such as thinning, pruning, drainage, pest management and other necessary measures to maintain a healthy forest environment.

2.2.10 Make the most of forest products

Many forest products, particularly wood products, last a long time. Until they are burned or decayed, they continue to store carbon and prevent GHG emissions. Forest managers can contribute to climate change mitigation by ensuring that, when trees are harvested, as much of the wood and other materials as possible is used. They can reduce GHG emissions further by ensuring that the waste products from timber processing are not burned, but recycled in other processes such as paper, board or bio-energy.

2.2.11 Improve efficiency in the use of fuelwood

As in forest fires, the burning of fuelwood releases stored carbon straight back to the atmosphere. Forest managers can therefore contribute to climate change mitigation by improving the efficiency of fuelwood use. Open fires, as used by local communities in many developing countries, are quite inefficient and result in large amounts of waste, contributing to forest degradation and sometimes to deforestation, air pollution and soil erosion. Fuel-efficient cooking stoves reduce the pressure placed on local forests by reducing the amount of wood consumed by up to 60 percent. They are designed to burn wood much more efficiently than an open fire, and they can even be fueled by compressed agricultural residues (e.g. nut shells, straw) or animal dung.

2.3 When should you consider developing a forestry VCM project?

Once a forest manager has identified the activities that should be implemented in the area concerned, the next decision is whether to make these activities the basis of a forest carbon project. There are many circumstances under which it does not make sense to do so. For instance, if a forest area is very small, or scattered over an enormous area, the costs will hardly ever outweigh any financial or reputational benefit that can be gained from entering the VCM.

The VCM can only be used to generate income if it can be proven to local stakeholders that all these costs are outweighed by the benefits that a forestry VCM project may bring. Not everybody is in a position to benefit from a forestry VCM project. It is important to emphasize that **financial rewards will only be realized if forestry VCM projects are designed carefully, and well-suited to the local situation**.

Providing general estimates of costs for verification and certification under the VCM or providing estimates of carbon revenues of forestry VCM projects is not realistic because these costs and benefits are very different for every individual project. Therefore, general information is provided later in this chapter to assist potential project developers in conducting a self-assessment. This information includes:

- Pros and cons of the Forestry VCM;
- What you can realistically expect from the VCM; and
- Social and environmental benefits of responsible forest and carbon stewardship.

It is clear that forest carbon markets need forest people, but do forest people need forest carbon markets? The answer is not straightforward. Box 2 outlines the results of a research program that ran for five years in

eight countries, which suggests that sometimes it can be very beneficial for local communities to engage in the forestry VCM.

Box 2: Linking CFM with VCM

The Kyoto – Think Global Act Local (KTGAL) project conducted a study to see if community forest management was able to increase the biomass (and carbon) stored in forests, and if local people were able to measure the results. The study took place in eight countries around the world, and found that:

1. Community forest management is often more effective at reducing forest degradation than centralized forest management programs.
2. Biomass increased in most of the community managed forest areas, and local people were able to measure the changes simply and accurately (Karky, 2009)

But would local communities benefit from selling additional carbon stored in their forests?

A cost-benefit analysis based on KTGAL's data for community forest groups in Nepal found that local people were more likely to receive a net income increase from VCM if:

1. They were able to continue using forest products; and
2. They had clear tenure arrangements and use rights (Karky, 2009).

Forestry VCM projects may only be worthwhile if they do not restrict forest product extraction. In some cases, it may not be worth pursing forestry VCM projects when the costs of losing access to such products and services are taken into account.

Sources: see also www.communitycarbonforestry.org
Karky, B. & Skutsch, M. 2009. The Cost of Carbon Abatement Through Community Forest Management in Nepal Himalaya. Ecological Economics, 69 (3). pp. 666-672
Skutsch, M. & S. Solis. 2010. How much carbon does community forest management save? The results of K:TGAL's field measurements. K:TGAL Project.

2.4 What can the forestry VCM deliver?

Table 1: Strengths and drawbacks of the voluntary carbon market

VCM strengths	VCM drawbacks
Flexibility: A variety of approved standards exist, and project developers can choose the standards and methods most appropriate for their situation. **Less rules to comply with:** Easier and faster to register a project and sell carbon credits compared to the compliance carbon market. **Cheaper:** Lower transaction costs.	**Lack of credibility:** Some standards lack credibility, meaning credits may be more difficult to sell. **Greater risk:** Higher potential to fall victim to unreliable buyers or sellers. Enforcement of rules is often weak. **Low price:** Unless associated with a credible standard, VCM carbon credits are worth less than those on the compliance market.

The voluntary carbon market is 'voluntary' because the investors in this market have decided, of their own accord, to pay for carbon credits. They are not legally required by any government or international institution to reduce their carbon emissions. Instead they are motivated by a sense of Corporate Social Responsibility (CSR). This means, in theory, that the voluntary carbon market should have fewer barriers to setting up projects than the compliance market. Table 1 above presents some of the strengths and drawbacks of the Forestry VCM.

The market for forest carbon credits has been steadily increasing over the past ten years. The volume of forest carbon credits traded on the VCM **nearly doubled** between 2008 and 2009 alone[11]. In 2010, forest carbon credits constituted 42 percent of the total volume of carbon credits traded on the VCM. This increase happened during the global economic crisis, a period when the total volume of carbon credits traded over the VCM (not just forestry projects) declined from 127 $MtC0_2e$ to 94 $MtC0_2e$. However, the average price for carbon in 2010 was US$6/ $tC0_2e$, down from US$6.50/ $tC0_2e$ in 2009, while the average price for land-use carbon credits (including forestry) has increased (see Table 2). Figure 5 below illustrates the significant increase in the volume of forestry carbon credits of different types of activities in recent years. The steep rise over the last three years is mainly due to a boom in the number of REDD projects.

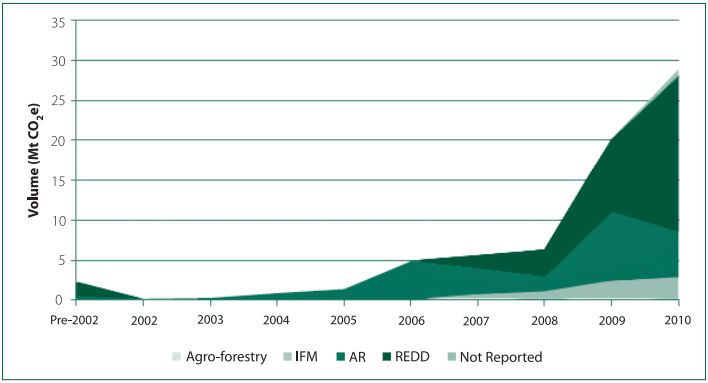


Figure 5: Historical volumes of land-use credits traded by project activity

Source: Forest Trends & Ecosystem Marketplace. State of the Forest Carbon Markets 2011: From Canopy to Currency. September 2011, p. 34

11 Peters-Stanley. 2011. *Back to the Future: State of the Voluntary Carbon Markets 2011.* Forest Trends, Ecosystem Marketplace.

The recent trend of steep growth in credits traded may continue, but some stakeholders are concerned that the VCM in forestry credits might collapse or stall because the deal for a future inter-governmental climate agreement is not expected until about 2020.[12] So it is important to ask why private sector investors are still engaged in this market and what makes forestry projects so interesting (see Box 3).

Box 3: Why would anyone invest in the forestry VCM?

Investors choose forestry VCM projects for many reasons. A 2009 survey of 141 corporate buyers of forestry offsets found that the top reasons for choosing forestry credits were:

- They address two major global problems – deforestation and climate change – at the same time.
- Forestry projects can help to enhance a company's public image, because forested ecosystems provide visually appealing images.
- They result in tangible land-use changes, and have a more visible impact than other kinds of carbon offset projects.
- They appeal to a wide variety of audiences, because they also offer co-benefits, such as biodiversity, conservation, poverty alleviation and human rights advancement.

Individual empowerment: The biggest reason to go for forestry VCM projects?

"The voluntary carbon markets provide individuals — not just corporations and large organizations — with a means of participating in the fight against climate change in a way that the compliance markets do not. In particular, some environmentalists view the voluntary carbon markets as an important tool for educating the

12 See "Forests and Climate Change after Durban: An Asia-Pacific Perspective' (FAO/RECOFTC, 2012)

public about climate change and their potential role in addressing the problem."

Source: "Investing in Forest Carbon: Lessons from the First 20 Years". January 2011, Forest Trends, The Katoomba Group, Ecosystem Marketplace, and Bio-Logical Capital.

The forestry VCM is a diverse and dynamic system that is changing all the time, so it is wise to keep the following points in mind:

Expect the price of carbon to be low, and volatile

The value of a carbon credit changes all the time. It can change based on general trends in the market, but its value also depends on the kind of standard used to certify the carbon credits generated through the project. Forest carbon credits are generally worth less than carbon credits from other kinds of VCM projects, such as renewable energy projects. One reason is because forest carbon that has been sequestered can be re-emitted into the atmosphere, i.e. it has less ***permanence*** (see Glossary).

Project developers should expect the price of carbon to change between the time they begin the project and the time they are ready to start selling carbon credits.

As Table 2 shows, the value of forestry VCM carbon credits has increased recently, while the price paid for energy-based credits has dropped.

Table 2: Average market prices for tCO_2e, 2009-2010

Type of project	2009 Average price (USD)	2010 Average price (USD)
Solar	34	16
Biomass	12	10
Wind	9	9
Improved forest management	7	6
Agroforestry	5	10
Afforestation & reforestation	5	9
Avoided deforestation	3	5

Source: Peters-Stanley. 2011. Back to the Future: State of the Voluntary Carbon Markets 2011. Forest Trends, Ecosystem Marketplace.

Bigger projects do not always mean more carbon credits

The amount of carbon credits generated by a project is not always directly related to the total project area. In fact, it is possible for a small area to generate more carbon credits than a large area. The three most important factors influencing the potential volume of carbon credits from a project are:

1. **The baseline:** What would happen in the business as usual (BAU) scenario? A carbon credit is based on the project results compared with the BAU scenario, or baseline. If the baseline is not significantly different from the project scenario, the amount of carbon benefits is low. If the difference is big, the amount of carbon benefits is large.
2. **Vegetation type:** Some vegetation types store carbon at faster rates than others.

3. **Environmental context:** Other aspects of the local environment that influence forest growth (such as climate, soil, drainage, risk of natural hazards, etc.) also affect carbon sequestration rates. These factors also limit the management strategies that foresters may use, and thus the VCM project types available to a potential project developer.

2.5 Choosing the project type

Forest managers considering the forestry VCM should seek the answers to a number of questions to decide whether the benefits will outweigh the costs. For each of the three main types of forestry VCM project, a different set of questions should be asked.

2.5.1 Afforestation, reforestation & re-vegetation (ARR)

- **Is the size and location of land appropriate?**

  Small areas will have higher start-up costs per unit area and may not be economically feasible unless they are grouped together with other areas under one project (see Box 1 in the Introduction section for an example of a Grouped Project).

- **Is it easily accessible?**

  People and vehicles will need to be able to reach the area. Appropriate road access may reduce costs and simplify operations.

- **How will the forestry activity affect plants and animals in the area?**

  Keep the impact on biodiversity in mind. In order to be verified for the VCM, a forestry VCM project must prove that negative impacts are minimized and are properly addressed.

- **What equipment and services will be needed?**

  Think about what equipment will be needed for planting, cultivating and managing the project area and how to acquire it.

- **What goods and services will need to be provided by the project area, to meet the needs of local people and other stakeholders?**

  Assess the needs of local people for forest products and services and the potential of the project area to deliver them.

Box 4: ARR case study: CO_2OL biodiversity reforestation Kon Tum, Viet Nam

This project aims to re-create a mixed species native forest on 1 500 ha of remote uplands in the Central Highlands of Viet Nam; an area which suffered severe ecological damage during conflict in the 1960s and 70s. Because the area has been classified as forest within the last fifty years, the project is classified as reforestation, not afforestation.

Planting began in 2009, creating about fifty jobs for the local community. The plantations will be managed purely for conservation, not for commercial production, and will serve important environmental functions as biodiversity corridors and watershed protection.

CO_2OL is a German company that manages the project in partnership with the local State Forest Enterprise (SFE). Technical support is

provided by German International Cooperation (GIZ) and the project is registered under the CarbonFix Standard. The project is expected to sequester about 400 000 tCO_2e over about thirty years.

The land is wholly owned by the SFE, which allows the project clarity over rights and tenure, crucial to generating carbon credits under the VCM. However, with local involvement limited to part-time, seasonal employment, the project may require quite intensive oversight by the SFE and their German partners. Depending entirely on the sale of carbon credits to finance project management entails a financial risk. ARR projects that can also generate income from other forest products or services are more stable in the long term.

For more information, visit the Viet Nam country page at www.theredddesk.org and download the project brochure from www.carbonfix.info/COB

2.5.2 Improved forest management (IFM)

- **Are the current forest management practices unsustainable?**

  If there are transparent and reliable records of forest management activities, and regular forest inventories, this will be quite easy to answer. However, the absence of such records, in itself, is an indicator of unsustainable practice.

- **In what way are they unsustainable?**

  It is essential that a manager is able to readily identify what current practices are unsustainable, in order to identify potential improvements.

- **Can these management activities be improved?**
  - Change the current logging practices that lead to degradation
  - Improve roads and extraction routes
  - Change how trees are managed and harvested
  - Conserve (more) areas of natural authenticity and protect biodiversity
  - Reduce the impact of logging on the forest environment

- **What will the improvement of the forest management yield?**
  - In terms of carbon
  - In terms of co-benefits

Box 5: IFM case study: INFAPRO, Rehabilitation of logged-over Dipterocarp forest Sabah, Malaysia

This project is taking place in an area of 25 000 ha of native forest which was heavily logged in the 1970s and 80s. Even 30 years after logging operations ceased, the forest has hardly recovered because no thought was given to this during harvesting operations. The Yayasan Sabah Foundation, together with the Dutch company FACE the Future, has therefore started an IFM project which takes the area out of production and implements management techniques designed to restore the mature native forest ecosystem.

INFAPRO is the first IFM project in the world to be registered under the Verified Carbon Standards (VCS). The project has been in operation since 1992, but has only recently registered under the VCS so that it can finance ongoing operations through the VCM. The methodology is based around enrichment planting of indigenous dipterocarps and fast-growing pioneers to kick-start ecosystem recovery and achieve quick gains in biomass. Extensive planting of native fruit trees is also an important aspect of the project, to encourage native animals, including orang-utans, to move back into the area. The project is located next to the Danum Valley Conservation Area, an important biodiversity hotspot in Borneo.

Yayasan Sabah Foundation is the holder of the logging concession in the project area, and therefore has the right to benefit financially from the VCM project. There are no significant conflicts over the project's impacts or benefits because the population density is very low. The project managers expect a total of 1 million tCO_2e net emission reductions over the thirty-year lifetime of the project, of which 660 000 have already been credited.

IFM projects in Sabah may in the future involve reduced impact logging (RIL) methods, in areas that are still under productive management. The environmental impacts of RIL methods are more complex than rehabilitation. INFAPRO is a relatively low-risk project, suitable for testing the new IFM methods under the VCM.

For more information, visit www.face-thefuture.com.

2.5.3 Reducing emissions from deforestation and forest degradation (REDD)

- **Who and what is causing the deforestation or degradation?**

  The agents or drivers of deforestation and degradation must be clearly identified before strategies to address those drivers can be elaborated.

- **How will the ongoing deforestation and degradation affect local livelihoods and traditional activities?**

  If forest loss and degradation continues, it will have impacts on local livelihoods, some of which will be positive and some negative. Analyse these impacts before deciding on whether a REDD project will be beneficial for local communities.

- **Will a REDD forestry project be able to stop the deforestation or degradation?**

  Some drivers can be readily addressed, while others have complex root causes and it will therefore be difficult to predict the impact of particular activities. Be realistic about what can be achieved through a REDD project.

- **Will the activities really be avoided or will they simply move to another area?**

  Leakage is a particularly important issue for REDD projects.

Box 6: REDD case study: Umiam sub-watershed REDD project Meghalaya, India

This project builds on six years of support by Community Forestry International (CFI) and the U.S. Agency for International Development (USAID) to the communities in the traditional kingdom of Mawphlang in the East Khasi Hills of Northeast India, one of the wettest places on Earth.

CFI has been working with the Khasi indigenous communities to build the capacity of their traditional institutions to manage their forest resources both for sustainable production and for environmental services. The communities identified four key activities which they need to implement in order to reduce degradation of the forest environment: fire control, controlled grazing, sustainable fuelwood collection, and controlled quarrying. They drew up a contract among themselves, witnessed by CFI, committing to implement these activities, provided that CFI and the Indian government assist them in securing financial and technical assistance.

This contract then formed the basis of a Project Idea Note (PIN) submitted to Plan Vivo Foundation in May 2011, which was approved in July, becoming the first REDD project in India. The emission

reductions generated through community-based forest management on 8 349 ha, specifically the four activities identified, will save over 400 000 tCO_2e over a thirty-year period. The sale of the carbon credits, verified according to Plan Vivo Standards, will cover the opportunity costs and implementation costs of the project for the communities involved. The communities thus receive the finance that they need to implement the activities that they identified themselves. Any surplus resources can be spent on general community development activities.

The Plan Vivo Standards are known for their particular attention to social safeguards, and can thus command premium prices for carbon credits on the VCM. About 95 percent of the land in the project area is officially community forest land under the direct ownership and control of the indigenous Khasi peoples, so all benefits of the project will accrue directly to them.

The project is first and foremost a community forestry and livelihoods security venture, with REDD carbon credits as a means of financing these objectives. However, the existing carbon stocks (and the baseline for emission reductions) have not yet been accurately calculated, so the true income-generating potential of the project through the VCM is unclear.

For more information, visit www.planvivo.org and download the Project Idea Note.

Some of the answers to the above questions will be clear-cut, and starting a project will evidently be beneficial. However, if the answer to one or more of the questions is “It depends…”, then a more in-depth understanding of the various standards comes into play. The carbon standards that have emerged as the leading tools for project certification in the forestry VCM are discussed in section 2.7.

2.6 Social and environmental co-benefits

A forestry VCM project may bring long-term social and environmental benefits to the project area and the local stakeholders. It may also undermine existing benefits unless appropriate safeguards are followed. Compared to the potential financial benefits of a forestry VCM project, these social and environmental co-benefits may be even more significant, for the following reasons:

1. More reliable, less risk

The value of carbon credits depends on finding a buyer in the VCM. However, social and environmental co-benefits do not depend on market conditions. A well-designed and well-executed project may have difficulty selling carbon credits if the market is unfavorable, but it will still yield co-benefits. Having said that, without carbon finance, the project may not be feasible.

2. No verification required

Unlike carbon credits, which need to be verified according to agreed standards and methods before they can be sold, most co-benefits can be enjoyed directly, without the need to prove their existence through the VCM.

3. Greater long-term value

If a forestry VCM project yields environmental benefits such as improved watershed protection and stable soils, local people may benefit from improved crop productivity and income stability, with more sustainable long-term benefits to local livelihoods than the income from carbon credits.

2.6.1 Environmental benefits

Losing forests means losing environmental services. A damaged forest will not be able to support the following essential functions:

- Watershed protection and improved water quality;
- Biodiversity conservation;
- Nutrient cycling;
- Soil conservation and stabilization;
- Reducing the risk of natural disasters;
- Protecting coastal areas; and
- Creating habitats for wildlife and plants.

Climate change will affect many of these functions with potentially devastating impacts on the environment, and the lives and livelihoods of people who depend on forests.

All of these ecosystem functions are important for a wide range of people, not just to those who manage the forests that provide them. In recognition of this, interest in Payment for Ecosystem Services (PES) is growing. PES schemes depend on finding people or organizations that are willing to pay, on a regular basis, for receiving these services. It is also challenging for PES schemes to succeed in delivering financial benefits to (the right) local forest managers and communities. The forestry VCM is essentially a form of PES – in which the ecosystem service is climate change mitigation – and the experiences of existing PES schemes hold valuable lessons for the forestry VCM. In the not too distant future it may become possible to 'bundle' several ecosystem and environmental services together (such as climate change mitigation, biodiversity conservation and watershed management, for example) where appropriate. This would also reduce the risk of double accounting – where two or more PES schemes overlap on the same area.

2.6.2 Social benefits

Forestry VCM projects may well result in enhanced livelihoods, as a result of both income from carbon credits, and diversification of income sources through improved environmental conditions, as noted above. However, certain social conditions regarding rights, governance and benefits need to be in place for a forestry VCM project to succeed. The process of meeting these conditions may yield additional non-monetary benefits for local people, such as:

- Clarifying land tenure and access rights. Forestry VCM projects need maps and clarification of boundaries in order to accurately account for carbon and determine what laws and policies govern the project area. This can help clarify outstanding tenure disputes for rural communities who lack legal tenure but are instrumental in managing and maintaining the forest area. The emerging issue of 'carbon rights' will bring these rights issues into sharper focus. See box 7 below.
- Gaining new knowledge and training in new skills. Local forest managers may have opportunities to receive training in carbon accounting methods, including forest mapping, forest inventory and plot sampling, GPS usage, and computer-based skills like remote sensing, GIS, and interpreting aerial images.
- Building local participation and democratic processes. No project can take place without widespread consultation of multiple stakeholders. Creating a venue for participation can enhance transparency and social equity.
- Receiving global recognition as responsible forest managers. Undertaking a successful forestry VCM project provides proof that the project developers, staff, and local partners are capable forest managers. This can be used to leverage funds for other projects from other companies and international donors.

Box 7: Carbon rights

Carbon rights have become a key cause of concern for many of the civil society organizations that follow the development of forest carbon projects.

Very few countries have attempted to define what is meant by a 'right to carbon', nor what benefits such rights give to the right-holder. In Australia and New Zealand, it is understood as a new form of *property right*. **The carbon in forests is therefore seen as a commodity that can be traded separately from the forest itself.**

This only really makes sense where a forest is clearly and legally owned by a single party, who can divide up the property in whatever manner they like. But in most of the Asia-Pacific region, where forest use rights, if not forest tenure, are traditionally held in common, **treating carbon as a separate property is at best confusing and at worst a source of misunderstanding and conflict.**

If carbon rights cannot be considered separately from the forest as a whole, project developers for the VCM should instead turn directly to forest use rights and ownership. 'Carbon rights' derive directly from existing traditional and legal forest use rights. VCM projects must resolve any outstanding disputes over these use rights before proceeding with the project.

The holder of a 'carbon right' has the right to benefit financially from the trade in environmental services, where the service is climate change mitigation, and the unit of trade is a carbon credit.

For more information, see REDD-net Asia-Pacific Bulletin 3: Carbon Rights and REDD+ available from http://redd-net.org/resource-library/

2.7 Forest carbon market standards

Compliance versus voluntary market

In terms of carbon markets, as stated before, there are basically two markets: the compliance (or regulated) market and the voluntary market. Among environmental services, carbon is unique in having a regulated market at the global level. There is no equivalent (yet!) for watershed services, biodiversity conservation or any other class of environmental service.

2.7.1 Compliance market

The only scheme under the compliance market for forestry projects in developing countries is the **Clean Development Mechanism (CDM)** under the Kyoto Protocol (KP) to the UNFCCC. The CDM only accepts A/R project activities: afforestation and reforestation, not IFM or REDD projects. Under the CDM, if an area has not been covered by forest for fifty years or more, the relevant activity is afforestation; if the forest was covered by forest in the last fifty years, but was deforested before 1990, the activity is called reforestation.

Two aspects are important here: the cut-off date of 1990 and the term 'forest'. The 1990 rule disqualifies many areas from A/R CDM because in many cases, particularly in the tropics, deforestation has occurred since that date. None of these areas can be used to generate carbon credits under the CDM.

The term 'forest' is also important. Most land has some kind of vegetation. Whether or not this vegetation is called forest (and whether or not it is therefore eligible for A/R CDM) depends on how a forest is defined. The countries that negotiated the agreement under the KP decided to use three parameters for this definition:

1. tree height;
2. crown cover; and
3. area.

For each of these parameters a range was determined within which each individual country was allowed to choose a value. These three values, chosen by the country, together determine when vegetation qualifies as forest. The ranges from which a country can select a value are as follows:

1. Tree height: between 2 and 5 metres at maturity (so, a specimen of a particular species must have the capacity to grow to that potential height at maturity);
2. Crown cover: between 10 and 30 percent (the proportion of ground obscured by foliage, when viewed from above, as a percentage of total area); and
3. Area of forest: between 0.05 and 1 hectare.

Each country can have its own set of parameter values, but they are known to the UNFCCC and can be accessed from the CDM website at http://cdm.unfccc.int/DNA/index.html. Any CDM project in the country must use the national definition.

Where countries have not made a choice on their forest parameters, the designated national authority (DNA) of a country, which approves all CDM projects, may require project developers to use any internationally acceptable definition for a forest (see Box 8).

Box 8: FAO forest definition

Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m at maturity ***in situ***. The area may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground; or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 percent. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 10 percent or tree height of 5 m are considered forests, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes, but which are expected to revert to forest.

Includes: forest nurseries and seed orchards that constitute an integral part of the forest; forest roads, cleared tracts, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific scientific, historical, cultural or spiritual interest; windbreaks and shelterbelts of trees with an area of more than 0.5 ha and width of more than 20 m; plantations primarily used for forestry purposes, including rubberwood plantations and cork oak stands.

Excludes: Land predominantly used for agricultural practices

Source: FAO http://www.fao.org/docrep/006/ad665e/ad665e06.htm

2.7.2 Voluntary market

The voluntary market has multiple standards to choose from. Professional help and advice may be needed to learn about the various standards of

the VCM, and decide which ones apply best to each specific situation. **The Verified Carbon Standard (VCS) and the Climate, Community, and Biodiversity (CCB) standards are the standards most often used for forestry and land-use projects.**

The VCS was the standard of choice for most forestry VCM projects in 2010, accounting for a projected volume of 15.6 MtCO2e of carbon credits, which was more than half of the total volume that project developers committed to deliver that year. Furthermore, 25 projects reported using the CCB Standards in 2010, covering well over half of that year's total market volume (see Figures 6 and 7).

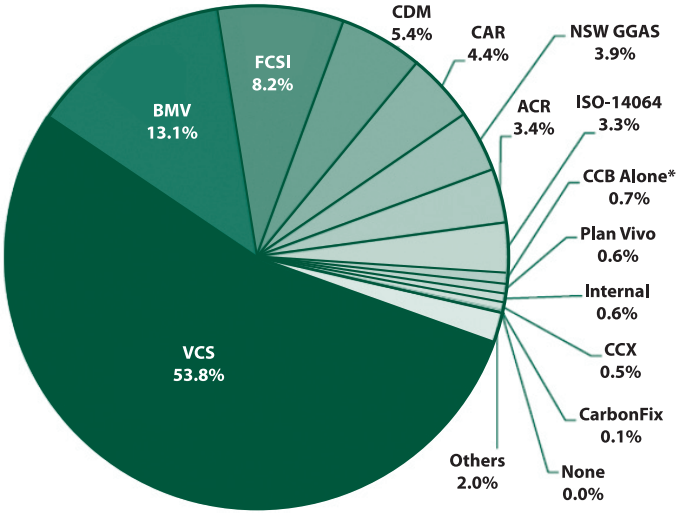


Figure 6: Verification standards market share 2010

Note: Projects must be verified under a carbon quantification standard in order to be issues verified offset credits.

*Several projects reported contracting offsets and only applying the CCB Standards. CCB certification alone will not result in credit issuance. The label "CCB Alone" is solely intended to distinguish these transactions from those that have applied no standards at all.

Source: Ecosystem Maketplace

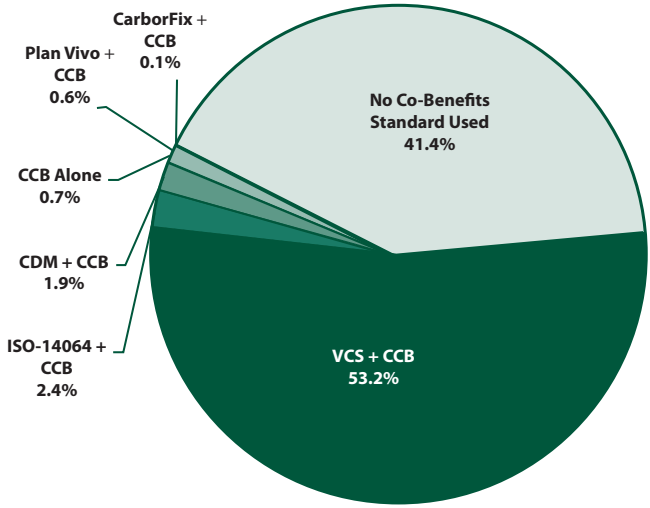


Figure 7: CCB standards market share 2010[13]

Note: Projects must be verified under a carbon quantification standard in order to be issued verified offset credits.

Source: Ecosystem Maketplace

The requirements for forestry VCM project developers may differ depending on the standard they follow, but the goal is ultimately the same: the standards ensure that carbon credits or verified emission reductions (VERs) are **'real, additional, measurable, permanent, independently verified, and unique'**. Each standard has its own methodological approach, but they all determine and quantify the baseline, net emissions of the project againt this baseline, and leakage.

Some standards do not accept all types of activities; however, they do all limit project eligibility according to the three core tests of both the voluntary and compliance carbon markets:

13 Source: "State of the Forest Carbon Markets 2011; from Canopy to Currency" http://www.forest-trends.org/~foresttr/publication_details.php?publicationID=2975

1. Additionality

The forestry VCM does not reward activities that have already started or have already been planned. The test of additionality is satisfied if these activities, and the resulting emission reductions, will ***only happen*** as a result of participation in the forestry VCM. There are tools available to test the additionality of a project, for instance on http://cdmrulebook.org/658.

2. Leakage

A forestry VCM project must demonstrate that it has minimized leakage, and has accurately quantified any leakage that does occur. Leakage may cancel out the benefits from a forestry VCM project, or even result in a net increase in emissions. In this case, a project cannot be credited, even if the source of leakage is beyond the direct control of the project manager.

3. Permanence

Carbon stored in forests can be released again. This has always been a great concern for negotiators under the KP. Under the CDM, this issue was addressed by issuing credits that have a validity of only five years, after which they expire and the project must go through a verification process again. The VCS, by contrast, uses a 'buffer tool', whereby credits that are at risk due to permanence-related issues, are placed in a buffer and cannot be traded. As time moves on, and as risks do not occur, credits are released from the buffer and can be sold.

Guidance for the VCS buffer tool is available at: http://www.v-c-s.org/sites/v-c-s.org/files/AFOLU%20Non-Permanence%20Risk%20Tool%2C%20v3.1.pdf

2.8 Choosing the right forestry VCM standard

The decision on whether or not to engage in the carbon market depends on the answers to many questions, as outlined in section 2.5. But once this decision has been made, and the appropriate type of project has been confirmed, the next question is: which forestry VCM standard should a forest manager choose?

There are four main standards currently used by forestry VCM project developers in order to advertise their credibility to investors. They have varying levels of stringency and some focus more on social and environmental co-benefits, while others concentrate on accuracy of carbon accounting.

This section explains more about the four main standards in the VCM:

- Verified Carbon Standard (VCS);
- Climate, Community and Biodiversity (CCB) Standard;
- Carbon Fix; and
- Plan Vivo.

2.8.1 VCS – verified carbon standard

The Verified Carbon Standard (VCS) is the most commonly used system in the VCM for ensuring accurate calculation of GHG emission reductions. It is already used by more than 600 projects worldwide.[14] Forestry projects only make up a small percentage of the total number, but their share is growing all the time.

14 VCS Project Database. Project and VCU Summary (Available at http://.vcsprojectdatabase.org/)

The VCS currently has about fifteen approved methodologies for measuring GHG emission reductions from 'Agriculture, Forestry and Other Land Use' (AFOLU) projects. Project developers can choose the methodologies most appropriate to them, for different types of project under the categories of ARR, REDD, IFM and more.[15] The system also lets project developers propose and develop new methodologies if the existing ones do not meet their needs.

The VCS system makes sure that all projects meet a high standard of quality; all project plans must be validated by an independent third party. An organization that has no stake in the success of the project checks that the plans make sense – and confirms that the project should achieve its objectives.

When the time comes for a VCS project to claim its carbon credits, the project manager's own calculations of actual emission reductions must also be verified by an independent third party. This organization (again, with no stake in the success of the project) checks that the project manager has done the calculations correctly and confirms how many carbon credits it can claim.

These independent third parties are known as validation/verification bodies (VVBs). They must be approved by the VCS and be properly qualified to carry out these tasks.

When GHG emission reductions have been verified, the project manager can request the VCS to issue carbon credits. In the VCS system, carbon credits are known as verified carbon units (VCUs), and whenever they are traded as carbon offsets on the VCM they are tracked through a registry system.

VCUs can be linked with other standards such as the Climate, Community and Biodiversity (CCB) Standard. Investors in the VCM like this, because it gives them extra assurance that the carbon credits have delivered

15 http://www.v-c-s.org/methodologies/find-a-methodology?title=&tid=14

environmental and social co-benefits. They may pay more for VCUs which achieve this double standard, than for those which are VCS only.

Grouped projects are an option for project developers working with an area that is too small to result in enough net GHG emission reductions to be sold as carbon credits (see Box 1). Several activities, in different areas and at different times, can be brought together to lower the transaction costs. Grouped projects can bring managers of small forest areas together in order to share the start-up and certification costs through the formation of project cooperatives.[16]

Because the VCS is currently the leading standard in the VCM, it will be used as a source of examples throughout these Guidelines.

2.8.2 Climate, community and biodiversity (CCB) standard

The CCBA[17] is a partnership of research institutions, corporations and NGOs. It was formed to develop and promote rigorous standards for evaluation of land-based carbon projects. The CCB Standard has been developed to help in the design of land management projects that simultaneously mitigate climate change, support sustainable development and conserve biodiversity. The CCB Standard does not verify emission reductions; it must be used in conjunction with the CDM, VCS or other carbon accounting standards.

As of May 2011, a total of 37 projects have completed validation, 14 projects have initiated the validation process, and two projects have achieved verification. Of these 51 projects, 41 are in developing countries.

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16 Full guidance for grouped projects can be found in the VCS Version 3. See Section 3.4 of: VCS. 2011. *VCS Standard: VCS Version 3*. (Available at http://www.v-c-s.org/sites/v-c-s.org/files/VCS%20Standard%2C%20v3.1.pdf)

17 More information provided at CCBA web site: www.climate-standards.org

At least 100 projects are planning to use the standards, representing over 9 million ha of protected areas and over 450 000 ha of native forest restoration with total estimated annual emissions reductions of over 17 million tons. Figure 8 shows the geographic distribution of projects using the CCB Standard (source: CCB Standards factsheet from http://www.climate-standards.org/).

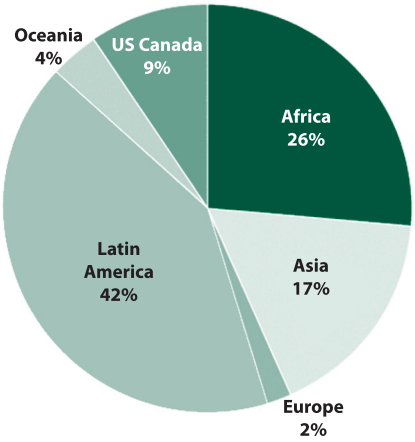

Figure 8: Geographic distribution of projects using the CCB Standard

The CCB Standard has become a requirement demanded by many brokers and investors in the forestry VCM. A recent survey confirmed that quality standards and multiple benefits are very important for buyers of forest carbon credits (see Box 3). The CCB Standard was rated the most 'highly desirable' standard by 67 percent of respondents globally and 79 percent of VCM investors in Europe would be willing to pay a premium of at least one dollar per ton for carbon credits which have CCB verification in addition to a carbon accounting standard. These results indicate that VCM investors are indeed sensitive to the social and environmental risks and opportunities of forest carbon projects.

The CCB Standard comprises 5 sections, four of which contain mandatory requirements and one optional section. The first section covers general project design issues. This is followed by three sections devoted, in turn, to climate, community and biodiversity issues. The 5th and optional section gives project developers the opportunity to achieve a Gold CCB Standard.

Procedures

The CCBA itself does not conduct certification against the CCB Standard; a third-party evaluator has to determine if individual criteria have been satisfied. A project validated as meeting the CCB Standard will be awarded a statement of compliance that is valid for five years. After this period, in order to maintain CCB certification, the project proponent must demonstrate that the project has been implemented in accordance with its original design.

During this on-site verification, which may be carried out by the original auditor or a new VVB, the project proponent must demonstrate that the project continues to yield net positive climate, community and biodiversity benefits compared to the business as usual (BAU) scenario, taking both on-site and off-site impacts into consideration.

Pros and cons

A key advantage of the CCB Standard is that, once obtained, it provides investors and other interested parties, such as NGOs and local communities, with assurance that this project is not only mitigating climate change, but also meets stringent social and environmental requirements. According to the CCBA itself, projects using the CCB Standard are unlikely to become mired in controversy; projects which deliver multiple benefits also generate valuable goodwill.

The disadvantage of the CCB Standard is that it does not certify the quantity of carbon credits that are generated by the project. Combination with a carbon accounting standard remains necessary, which can lead to increased work load, and therefore increased costs, for the project developer.

2.8.3 CarbonFix standard

This standard[18], which emphasizes sustainable forest management, is for afforestation and reforestation (A/R) activities only, and is not applicable for IFM or REDD. CarbonFix deals with projects located anywhere in the world, and supports projects with demonstrated commitment to social and economic responsibility. CarbonFix aims to deliver real and traceable certification for carbon credits entering the forestry VCM, but uses companies accredited by the CDM, VCS or Accreditation Services International (ASI) to verify the carbon claims of the project:

The CarbonFix Standard (CFS) is an initiative supported by organizations which aim to promote the development of A/R projects. The CFS is administered by CarbonFix, a non-profit association based in Germany, which developed the Standard in 2007 in cooperation with experts in the fields of forestry, climate change and development aid. The organization itself was founded in 1999, to follow the UNFCCC negotiations and promote the potential of A/R projects for climate change mitigation through the VCM.

CFS also offers the option to register emission reductions that are likely to be accrued by the project in the future. Those credits are recognizable in their registry with an identifier. CFS helps project proponents to invite investors to acquire 'futures' in the project, before the emission reductions have been achieved.

18 See www.carbonfix.info for more information

Structure-wise, the CarbonFix Standard consists of three parts: Terms; Criteria & Methodology; and Procedures. The core of the standard is the requirements described under the Criteria & Methodology. This section lists the criteria that a project has to meet to become certified, including the characteristics of the land where tree planting can take place.

The CFS provides criteria which ensure that the projects provide for social and ecological benefits. The bottom line is that projects must illustrate benefits to the community, apart from the reduced emissions. These should range from job creation, to water, soil stability and biodiversity protection.

Pros and cons

A positive aspect of the CFS is that its documentation and calculation processes are simplified, while its methodology is quite short and includes all parameters of the A/R CDM framework (CO_2-fixation, baseline development, leakage and emissions calculation) as well as the selection of carbon pools. It encourages dual certification with the CCB Standard or the Forest Stewardship Council (FSC). Additionally, the documentation provides assistance and templates for each section of the methodology, which is a great benefit for smallholders and community groups. However, not all types of A/R projects are accepted by CarbonFix. For example, afforestation on wetlands, agricultural land, and permafrost are all non-certifiable.

Procedures

To become registered under CFS, the project developer has to register at the CFS website and download the templates. These documents will guide the project developer through every step of the standard, thus making the CFS quite user friendly.

The templates will be uploaded on completion, including calculations of actual and projected carbon stocks, maps (including GPS coordinates), additional photos from the field and other background data.

After uploading all necessary information the project developer can request for validation online, which is conducted by the technical board of CarbonFix. Upon successful validation the project can apply for the verification process, which is carried out by an accredited third party.

The frequency of the field verification process can vary from two to five years, depending on the duration of the project.

2.8.4 Plan Vivo systems and standards

Plan Vivo is a Scottish registered charity and represents a system for developing community-based PES projects and programmes. Plan Vivo is an ethical standard and system that "puts people at the heart of the solution."[19]

Plan Vivo projects and programmes aim to:

1. Empower communities to take control of their resources through better land management;
2. Reduce poverty and improve rural livelihoods and food security;
3. Generate long term, verifiable carbon services backed up by a shared carbon buffer; and
4. Enhance ecosystem services such as biodiversity and watersheds by planting and protecting natural forests.

To date, Plan Vivo has issued certificates covering over 1 million tCO_2e.

19 www.planvivo.org

Certified projects cover over 5 000 smallholders and community groups, a total of 22 771 ha and have resulted in over USD 5 million of funds being channeled to the forest owners.

Forest managers may consider using Plan Vivo when they operate in developing countries to promote sustainable rural livelihoods; plan to work with small-scale producers to deliver ecosystem services, specifically long-term carbon sequestration; and wish to promote the protection and/or planting of native tree species.

According to Plan Vivo, land-use change initiatives will only succeed and have permanent impacts where they meet local needs. The Plan Vivo System ensures livelihood needs are built into the project design, and that local income sources are diversified to reduce poverty and tackle the root causes of deforestation and degradation. Supporters of the projects can be confident that funds will reach the grassroots level. Projects are monitored to check that an equitable proportion of project finance reaches communities, and that funds being held in trust are secure.

The Plan Vivo System and Standard are designed to be simple where possible, in order to ensure that they are accessible to developing country organizations. It is important for the system to achieve a balance between robust technical requirements and flexible, minimum standards that ensure projects can improve as they develop and scale-up. Plan Vivo projects also promote the restoration of native ecosystems, improve biodiversity and protect watersheds.

Procedures

The steps towards accreditation under Plan Vivo are as follows:

1. Submit the Project Idea Note (PIN) to the Plan Vivo organization for review. The PIN defines the main elements of a proposed project and how it will contribute to sustainable livelihoods.

2. Submission of technical specifications for peer review: The carbon benefits of each Plan Vivo project are calculated using technical specifications (see chapter 3 in the standard at http://www.planvivo.org/documents/standards.pdf. The Plan Vivo Foundation coordinates peer reviews of technical specifications through its Technical Advisory Panel).

3. Submission of Project Design Document (PDD) and request for field visit. Projects compile information on the project area and location, participants, activities and other information using the Plan Vivo PDD template.

4. Validation – field visit. To become registered as a Plan Vivo project, a project is visited and assessed to ensure it is implementing systems according to its approved documents and the requirements of the Plan Vivo Standard.

5. Registration. Following approval of technical specifications and approval of the project by the reviewer, projects are entered into the Plan Vivo Projects Register. Once registered, projects can enter into sales contracts with purchasers for Plan Vivo Certificates.

Pros and cons

This standard is specifically geared towards communities. In contrast to the CCB Standard, Plan Vivo does offer an entire package, including carbon certificates.

The main drawback is that it is a long process. In addition, it is not as robust as VCS or CDM in terms of quantifying carbon benefits. It is more geared towards community and biodiversity benefits.

2.9 Comparing standards of the forestry VCM

Not all project types are eligible under all standards. Table 3 indicates which standards accept which project type.

Ex-ante refers to an estimate of carbon credits that will be accrued by the project in future. **Ex-post** means that carbon credits are only certified once they have been accrued.

In practice this means that the CarbonFix standard registers carbon credits that have not yet materialized. The advantage of this is that potential investors have assurance from the standard that these carbon credits will eventually be accrued. The credits have a specific identifier attached to their serial number that identifies them as 'futures'. These are carbon benefits that may occur in future if the project is implemented according to the validated Project Description.

Table 4 shows the numbers and types of projects that have been certified against the various standards.

Table 3: Comparative 'use' breakdown of forestry VCM standards.[20]

Standard	Afforestation/ reforestation	IFM	Agroforestry	REDD	Carbon credits
CDM	Yes	No	Yes*	No	Ex-post
VCS	Yes	Yes	Yes	Yes	Ex-post
CarbonFix	Yes	No	Yes*	No	Ex-ante and Ex-post
CCBS	Yes	Yes	Yes	Yes	N/A**
Plan Vivo	Yes	Yes	Yes	Yes	Ex-post

* Under certain conditions; only if it also qualifies as afforestation or reforestation
** The CCB Standard does not certify carbon credits

Table 4: Forestry VCM projects registered with the main standards[21]

Standard	Number of forest carbon projects	Number of ARR projects	Number of IFM projects	Number of REDD projects	Combination projects
CDM	37	37	-	-	-
VCS[22]	22	13	5	4	-
CCBS[23]	69	30	9	18	12
Carbon Fix	9[24]	9	-	-	-
Plan Vivo	15	5	-	3	7

20 FAO. 2010. *First Regional Workshop: Setting the Foundation. Linking Communities in Southeast Asia to Forest Voluntary Carbon Markets.* Chiang Mai, Thailand (Available at http://www.carbon2markets.org/uploads/news/FAO_RAP_Agenda_Chiang_Mai_Sept_2010.pdf)

21 As of 18th March 2012

22 VCS Project Database. List of AFOLU Projects. (Accessed January 15, 2012).

23 CCBA. 2011. CCBA Fact Sheet.(Available at https://s3.amazonaws.com/CCBA/CCBStandards_FactSheet.pdf)

24 Carbon Fix Standard. Projects. (Available at http://www.carbonfix.info/Project.html)