GUIDEBOOK

FOR THE FORMULATION OF AFFORESTATION AND REFORESTATION PROJECTS UNDER THE CLEAN DEVELOPMENT MECHANISM

TECHNICAL SERIES 25 2006

INTERNATIONAL TROPICAL TIMBER ORGANIZATION

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Guidebook for the Formulation of Afforestation and Reforestation Projects under the Clean Development Mechanism

ITTO Technical Series 25

by Timothy Pearson, Sarah Walker and Sandra Brown

The International Tropical Timber Organization (ITTO) is an intergovernmental organization promoting the conservation and sustainable management, use and trade of tropical forest resources. Its 59 members represent about 80% of the world's tropical forests and 90% of the global tropical timber trade. ITTO develops internationally agreed policy documents to promote sustainable forest management and forest conservation and assists tropical member countries to adapt such policies to local circumstances and to implement them in the field through projects. In addition, ITTO collects, analyses and disseminates data on the production and trade of tropical timber and funds projects and other actions aimed at developing industries at both community and industrial scales. All projects are funded by voluntary contributions, mostly from consumer member countries. Since it became operational in 1987, ITTO has funded more than 750 projects, pre-projects and activities valued at more than US$290 million. The major donors are the governments of Japan, Switzerland and the USA.

ITTO contact details can be found on the back cover.

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FOREWORD

There is now almost universal consensus among climate-change scientists that the world is warming up; most also believe that this warming is due largely to human-induced atmospheric emissions of greenhouse gases such as carbon dioxide. To help deal with the problem, the international community created the Kyoto Protocol to the United Nations Framework Convention on Climate Change, under which emission-reduction targets were set for developed countries (so-called Annex-1 countries) and mechanisms devised to help countries meet these targets.

The Clean Development Mechanism (CDM) is one of the mechanisms of the Kyoto Protocol, which took effect in February 2005. The CDM is an arrangement allowing Annex I countries to invest in emission-reducing projects in developing countries as an alternative to what might be more costly emission reductions in their own countries. The CDM allows various kinds of projects, of which afforestation and reforestation (AR) projects are of interest to the tropical forest sector.

A great deal of work has been done to identify opportunities for AR-CDM, particularly in the rehabilitation of degraded tropical forest lands. However, given weaknesses in the institutional and legal arrangements for AR-CDM, it is not surprising that progress in it has so far been minimal in many tropical countries. The CDM project cycle is very demanding on project developers, involving project design and development, validation, registration, monitoring, verification and certification, and the issuance of carbon credits. It also poses challenges in the development and use of methodologies to define baselines, monitoring and additionality. As of August 2006, only three baseline and monitoring methodologies had been approved by the CDM Executive Board.

ITTO has always recognized the valuable ecosystem services that tropical forests perform. Such forests provide habitat for millions of species, produce a large proportion of the world's supply of fresh water, and are crucial in the global carbon cycle and therefore in regulating the global climate. The Organization has worked for many years to assist its tropical member countries to rehabilitate degraded forest lands, not only to increase the benefits that such lands provide to local communities but also to help maintain a sustainable supply of forest goods and services. ITTO is promoting the implementation of the ITTO Guidelines for the Restoration, Management, and Rehabilitation of Degraded and Secondary Tropical Forests, which, among other things, recommend the development of strategies and approaches to promote degraded-forest restoration and secondary forest management for carbon sequestration and carbon trade. It is therefore a logical progression for ITTO to assist its members to engage in AR-CDM projects.

Potential AR-CDM project developers in tropical countries will require, among other things, full access to relevant information and capacity-building programs for the design of project activities. To help them in this, in late 2005 ITTO initiated a project (Building capacity to develop and implement afforestation and reforestation projects under the Clean Development Mechanism (AR-CDM) of the Kyoto Protocol – PD 359/05 Rev.1 (F)) with the aim of building the capacity of project proponents to formulate and implement AR-CDM projects and to facilitate public-private partnerships that link host developing countries with potential investor countries.

As part of the project, Winrock International was commissioned to prepare a guidebook for the formulation of AR-CDM projects; I thank Winrock's Timothy Pearson, Sarah Walker and Sandra Brown for their excellent work in doing so. I also thank IUCN's Stephen Kelleher for his contribution to Part 1.4. We hope that this important guidebook will serve as a useful tool to professionals in government and non-governmental organizations, helping them to fully realize the potential of AR-CDM to deliver resources for the rehabilitation of degraded tropical forest lands and the sustainable development of tropical countries.

Manoel Sobral Filho
Executive Director – International Tropical Timber Organization

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INTRODUCTION

The purpose of this guidebook is to serve as guidance for those interested in developing a land-use change and forestry project under the Clean Development Mechanism (CDM) of the Kyoto Protocol. The guidebook has been created by Winrock International, in collaboration with the International Tropical Timber Organization.

The guidebook is presented in three parts:

Part I is an introduction to the Kyoto Protocol and the CDM. The key terms and concepts required to understand the remainder of the guidebook are explained here. The interest, motivation and role-to-date of the International Tropical Timber Organization in CDM projects are also introduced.

Part II describes the conceptual and procedural details for formulating a land-use change and forestry CDM project. The structural and technical units of the United Nations Framework Convention on Climate Change that manage and oversee the CDM project approval process within the Kyoto Protocol framework are introduced. A step-by-step guide to project development is also outlined.

Part III explores the financing of CDM projects. Discussions include an overview of the global carbon market and potential sources of project financing, including those for project development.

References and resources are given in the **Annexes.** The final annex contains the Project Development Document for land-use change and forestry projects under the CDM and guidance on its completion.

Guidance is not given on measuring or monitoring project benefits, nor on how to calculate project carbon benefits. This guidance is available elsewhere, and links and references are provided in the Annexes.

ACKNOWLEDGEMENTS

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PART I: CDM AFFORESTATION AND REFORESTATION PROJECTS AND THE ITTO'S CAPACITY-BUILDING INITIATIVE

1.1 Policy Background

1.1.1 The United Nations Framework Convention on Climate Change

In 1992, most countries joined the United Nations Framework Convention on Climate Change (UNFCCC[1]) to begin considering what could be done to reduce global warming and how to cope with whatever temperature increases might result. A major accomplishment of the Convention, which is general and flexible in character, is that it recognised there was a problem – a significant accomplishment in 1994 when the UNFCCC was ratified by 189 countries, because at that time less scientific evidence was available.

The UNFCCC sets an ultimate objective of stabilising greenhouse gas emissions "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system". It states that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner".

Countries that have ratified the UNFCCC – called "Parties to the Convention" – agree to take climate change into account in matters such as agriculture, industry, energy, natural resources and activities involving sea coasts. They have also agreed to develop national programmes to slow climate change on a voluntary basis. The Convention places the heaviest burden for halting climate change on industrialised nations because they are the source of most past and current greenhouse gas emissions.

The first step in solving a problem is to know its dimensions. To address this issue, the Parties of the "developed nations" and nations with "economies in transition" (called Annex I countries because they are listed in the first annex to the Convention) are required to report updated inventories of greenhouse gas emissions on a regular basis. With a few exceptions, the "base year" for tabulating greenhouse gas emissions has been set as 1990. Developing countries (also referred to as non-Annex I countries) also are encouraged to compile greenhouse gas inventories.

The UNFCCC is recognised as a "framework" document – that is, something to be amended or augmented over time so that efforts to deal with global warming and climate change can be focused and made more effective. The first addition to the Convention, the Kyoto Protocol, which contains more powerful (and legally binding) measures, was adopted in 1997.

1.1.2 The Kyoto Protocol

Under the UNFCCC, Parties agreed to annual meetings called Conferences of the Parties (COP [2]). At the Third COP in Kyoto, Japan, in 1997, a protocol was agreed that set greenhouse gas emission reduction targets for industrialised countries and countries with economies in transition. Annex I countries committed to reducing their emissions by an average of 5 percent below 1990 levels in the period 2008-2012. The Kyoto Protocol came into force on the 16 February 2005. To date, 163 states have ratified (or acceded to) the Kyoto Protocol, including 35 Annex I countries (whose emissions represent 61.6 percent of total Annex I Party emissions).

Three market-based "flexible mechanisms" were included under the Kyoto Protocol to help reduce the cost of implementation. These mechanisms allow industrialised countries to reduce emissions outside their national boundaries and to count these reductions towards their national target. The mechanisms are:

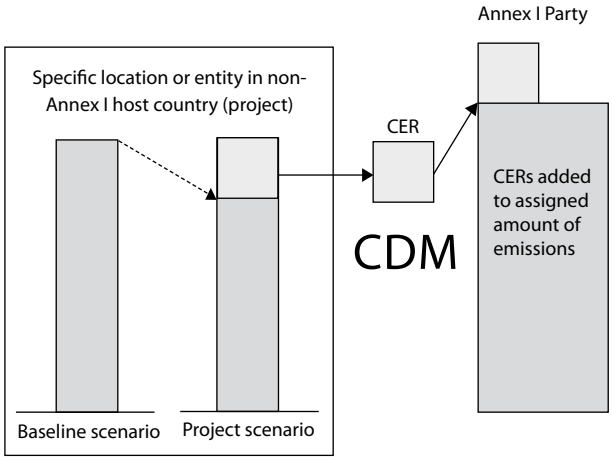
- **International Emissions Trading** (Article 17), which allows Annex I Parties to trade part of their assigned cap;
- **Joint Implementation** (Article 6), which functions at the sub-national level so that project activities can be sponsored and implemented in one Annex I country to meet reduction requirements in a second Annex I country; and
- **The Clean Development Mechanism** (Article 12), which allows the sponsorship and implementation of project activities in non-Annex I Parties and is the focus of this guidebook.

The Clean Development Mechanism (CDM)

The CDM, like Joint Implementation, is a project-based mechanism. However, unlike Joint Implementation and International Emissions Trading, the CDM involves host Parties that do not themselves have an emissions cap or emissions reduction target. The CDM, as detailed under Article 12 of the Protocol, states:

"The purpose of the clean development mechanism shall be to assist … [non-Annex I Parties] … in achieving sustainable development and … to assist … [Annex I Parties] in achieving compliance with their quantified … commitments …".

The figure below explains CDM project emission trading. A CDM project activity is undertaken at a specific location in a non-Annex I host country where CDM financing – or the prospect of CDM financing – leads to either a reduction in emissions or an increase in sequestration. The difference in quantity of emissions or sequestrations between what occurs with the project and what would have occurred without the project is tradable. Once verified, this difference becomes x tonnes of Certified Emissions Reductions (or CERs, the CDM trading unit) which, when purchased by an Annex I Party, is added to that Party's assigned emissions and permits the Annex I Party to emit an additional quantity of carbon dioxide (CO_2) or non-CO_2 gases equal to the verified CER.



As trading under the CDM takes place with non-capped hosts, the CDM leads to an increase in the total amount of the emissions cap of Annex I countries. The CDM effectively grants a license to emit up to the total emissions savings secured by project activities in non-Annex I host countries – that is, countries are trading emission offsets. The CDM, as its name implies, is supposed to stimulate clean development for the populations of non-Annex I countries.

There are 15 categories of eligible CDM project activities:

1. Energy industries (renewable/non-renewable sources);
2. Energy distribution;
3. Energy demand;
4. Manufacturing industries;
5. Chemical industries;
6. Construction;
7. Transport;
8. Mining/mineral production;
9. Metal production;
10. Fugitive emissions from fuels (solid, oil and gas);
11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride;
12. Solvent use;
13. Waste handling and disposal;
14. Afforestation and reforestation; and
15. Agriculture.

The focus of this guidebook is Afforestation and Reforestation – the sole eligible land use, land-use change and forestry (LULUCF) activity under the current phase of the CDM.

1.1.3 Land Use, Land-Use Change and Forestry Projects

LULUCF projects form a special category under the Kyoto Protocol, as growing trees lead to the sequestration of CO_2 rather than the avoidance of greenhouse gas emissions. Trees can also be cut down at any time, potentially releasing the stored carbon – that is, the carbon stored is not necessarily permanent. (With energy, by contrast, once an emission has been avoided it is effectively permanent.) In the context of the CDM, LULUCF projects have an added value. Trees can be grown in most areas of the world, providing benefit to the poorest people in the poorest areas. Potential energy project locations are more limited, which partially accounts for why less than three percent of the registered CDM projects (as of March 2006) are located in Africa. LULUCF projects also tend to have a large number of "co-benefits", such as erosion prevention, watershed protection, enhanced biodiversity, provision of forest resources for local people, and many more.

There are cases where LULUCF projects can encompass emissions avoidance – such as the avoidance of deforestation, reduction in fire risks or changes in forest harvesting (for example, changing from conventional logging to reduced-impact logging). However, it was determined at the Seventh COP (COP-7[2]) in Marrakesh, Morocco, in 2001, that, at least for the first commitment period, LULUCF projects under the CDM should be limited to afforestation and reforestation.

Afforestation was defined as replanting with trees areas that had been without forest for at least 50 years; **reforestation** was defined as replanting with trees areas that had been without forest since at least 31 December 1989. Under CDM regulations, afforestation and reforestation are practically treated in the same way.

At COP-7, it was decided LULUCF projects could not represent more than one percent of the assigned emissions amount of any country for each of the five years of the first commitment period (2008-2012), to a total of 137 million tons CO_2-equivalent (t CO_2-e) per year. To put the size of allowable CDM offsets in perspective, 137 million t CO_2-e per year is equivalent to 4,500 afforestation/reforestation projects with an average area of 3,000 hectares and a mean annual sequestration of 10 t CO_2-e per hectare per year.

1.2 Afforestation and Reforestation Projects under the CDM

1.2.1 CDM Projects

A CDM project is an activity undertaken in a non-Annex I country that results in reduced emissions of greenhouse gases or increased sequestration. In the case of forestry projects, growing trees fix (or sequestrate) CO_2 from the atmosphere into stable living material. CDM projects must be registered with the Executive Board of the CDM. This is achieved through the validation of a Project Design Document by an official auditing organisation known as a Designated Operational Entity.

In *Part II*, the steps to creating and registering a CDM project are outlined, while the finances required for the project development and sources of funding are discussed in *Part III*.

To prove there is an atmospheric benefit to a project activity, it is necessary to show the project is doing more than "business as usual" – in the case of afforestation and reforestation projects, increasing sequestration above that which was occurring before the start of project activities. The project must also be "additional", which means there must be certainty that the activity would not have occurred without the CDM incentive – that is, that CDM money was the critical catalyst. Finally, the project must also not lead to a displacement of emissions or "leakage", which would lead to a loss of the greenhouse gas benefits of the activity.

BOX A: Pearl River Watershed Management, China

This project proposes to alleviate local poverty and reduce threats to forests by afforesting 4,000 hectares in the Guangxi Zhuang Autonomous Region, including half of the Pearl River basin. The sites to be planted are: shrub land, grassland and open tree land with tree cover below 20 percent so as to meet the Kyoto Protocol rule for China. Seventy-five percent of the species planted will be native, including *Pinus massoniana* mixed, *Liquidambar formosana, Cunninghamia lanceolata, Schima superba, Quercus griffithii* and *Quercus acutissima*. Eucalyptus will make up the bulk of the exotics.

The restoration of the forests along the middle and upper reaches of the Pearl River will help demonstrate models for watershed management. The use of the carbon sequestered by a plantation as a "virtual" cash crop will generate income for local communities. As the first life-size LULUCF project in China, the project will also test how afforestation activities can generate high-quality emission reductions in green-house gases that can be measured, monitored and certified.

Finally, the project will work within the confines of the larger Guangxi Integrated Forestry Development and Conservation Project (GIFDCP) umbrella that addresses closely inter-linked threats to Guangxi's natural forests, watersheds and biodiversity through an integrated approach to managing these natural resources at the landscape level.

The project is expected to sequester around 0.34 million t CO2-e by 2012 and around 0.46 million t CO2-e by 2017. It will connect fragments of forest adjacent to nature reserves, providing corridors and habitats for wildlife and increasing biodiversity conservation.

Other environmental benefits include the reduction of soil erosion, improvement of the regulation of hydrological flows, leading to reduced flooding and drought risks, and provision of incentives for people to invest in sustainable land use. The reforestation is additional in the project areas because it is not economically feasible without the additional income from the carbon sales for managing the reforested lands as multiple-use plantations. The project will provide benefits to farmers and communities ranging from direct income supplements to broader social benefits.

Project implementation will create about 5 million person-days of temporary employment and 40 long-term positions for local farmers. About 5,000 households are expected to see their incomes increase through the sale of carbon, timber and non-timber forest products. The project will identify potential environmental or social risks and work to mitigate them. Local forestry agencies, in particular, will provide technical support and training to the local communities for designing, implementing and monitoring the project, and will monitor the environmental and social benefits, including carbon sequestration. Community involvement will reduce the risk of non-permanence and any potential leakage.

The project will be financed by the Government of the Guangxi Zhuang Autonomous Region, farmer co-operatives, the Kangyuan and Fuyuan forest farms, the Luhuan Forestry Development Company, the World Bank through its loan to the GIFDCP and a local agricultural bank. The forestry farms and companies are the private afforestation and timber production enterprises, which will implement and finance the project.

Text courtesy of World Bank BioCarbon Fund

BOX B: Pico Bonito Forest Restoration, Honduras

This project will assist small-scale farmers in the Pico Bonito National Park buffer zone to introduce agroforestry production techniques. More specifically, community pilot projects will be implemented for sustainable forestry management of native species and the following activities: (1) agroforestry for small-scale producers; (2) reforestation for conservation; and (3) reforestation for sustainable commercial forestry, with the establishment of a commercial-grade plantation. The project will cover 2,600 hectares and benefit 20 villages living in this zone. Pico Bonito, the third largest national park in Honduras, is home to many endangered and threatened species and provides essential connectivity for the Meso-American Biological Corridor. Its natural resources have been seriously degraded due to marginal agriculture and cattle grazing. The project is expected to sequester around 0.34 million t CO2-e by 2012 and around 0.63 million t CO2-e by 2017.

The income provided by carbon sequestration is key to the realisation of the project. The combined reforestation efforts will greatly enhance the park's ability to sustain threatened biodiversity in addition to improving the integrity of headwaters for several rivers that originate in the park and its buffer zone. More specifically, the project seeks to provide several environmental benefits, including improved slope stability, reduced soil erosion on steep slopes and enhanced upland watershed integrity for freshwater production.

The project will employ hundreds of local people to establish a commercial-grade plantation certified by the Forest Stewardship Council, as well as to reforest degraded lands in the park's buffer zone for conservation. It will also integrate social benefits to the villages in the zone through on-farm technical assistance, sustainable forestry management training, establishment of sustainable livelihoods and permanent sharing of profits for community investment. The project will monitor potential leakage stemming from the increased protection of the park, which will also reduce the risk of non-permanence of the carbon sequestration.

The project has been developed by EcoLogic (www.ecologic.org), a non-governmental organisation (NGO) with a mandate to protect Latin American wildlife and wildlands by advancing community-based economic development and natural resource management. Together with sponsors and community representatives, they will create a for-profit company, Pico Bonito Inc., to manage the project and own the CERs. Fundación Parque Nacional Pico Bonito, a Honduran NGO dedicated to the sustainable management of Pico Bonito National Park since 1994, will be subcontracted to handle the agroforestry and conservation components of the project. The World Bank's BioCarbon Fund funding is a small percentage of the overall funding needs for this project. OPIC has issued a letter of support for a long-term loan contingent upon meeting debt ratios. Other investors include Corporación Hondureña de Desarrollo Forestal (www.cohdefor.hn), Honduran and international investors and lenders, and various private landholders in the region.

Text courtesy of World Bank BioCarbon Fund

BOX C: Pairing afforestation and reforestation project activities with energy

Afforestation and reforestation projects can produce biomass that, once harvested, can be used for the generation of heat, electricity or liquid fuels. There are already a large number of projects that use biomass residues in the process of being validated or registered with the CDM Executive Board.

Other projects, for example for the production of liquid biofuels, use special crops that are purpose-grown. However, no liquid biofuels methodologies have been approved yet by the Executive Board, in part due to concern that land-use leakage may cause deforestation or forest degradation. Some of these projects source their biomass from the general market, which makes it very difficult to trace the origin of the biomass and thus its sustainability – that is, whether the biomass production is causing any decrease in carbon stocks. Other projects may produce the biomass on areas that are under the control of project participants who also operate the bioenergy project.

Where the biomass production component is an afforestation or reforestation project, the current rules require that the afforestation/reforestation component be submitted as a project separate from the bioenergy component. Each of the two parts needs to use its own methodology and have its own validation, monitoring, etc. Each component should reference the other in the Project Design Document so that no additionality doubts occur. Otherwise, the possibility exists that the component submitted at a later time may be considered non-additional (see *Section 1.2.4*), as it only makes full economic sense in combination with the already approved first part.

Ideally, however, the Executive Board should allow integrated methodologies and a Project Design Document for the combined afforestation/reforestation and bioenergy projects, so that the process can be simplified and transaction costs reduced. These combined projects offer the benefit of using already approved afforestation/reforestation methods for estimating or reducing leakage, while at the same time alleviating concerns that the biomass used in the energy component may not be sustainably produced.

In summary, significant synergies can be achieved by combining afforestation/reforestation and bioenergy methodologies and Project Design Documents. An added benefit is that at times when carbon stocks in the afforestation/reforestation projects are decreased due to harvesting, some of the shortfall can be made up by permanent credits from replacing fossil fuels in the bioenergy component.

The afforestation and reforestation CDM project rules and conditions are outlined in *Section 1.2.3*.

1.2.2 Relevant Afforestation and Reforestation Activities under the CDM

Despite the limitations to afforestation and reforestation, LULUCF project activities can still be relatively diverse and cover activities such as:

- native forest restoration;
- timber plantations;
- agroforests/multi-purpose trees; and
- recuperation of barren areas.

Examples of two projects are given in Boxes A and B. Afforestation and reforestation activities can also be paired with energy projects – an example of such a project is given in Box C.

1.2.3 Afforestation and Reforestion CDM Project Rules and Conditions

CDM projects must result in carbon credits that are effectively permanent, in addition to business as usual, and will not lead to carbon losses outside the project boundaries[3].

1.2.3.1 Approach for addressing non-permanence

During the negotiations leading up to the Kyoto Protocol and subsequently, there was considerable concern that credits issued for carbon sequestration would be subject to a risk of re-emission due to either human action or natural events such as wildfires. This was called the permanence risk and is unique to LULUCF projects under the Protocol.

The danger is that CO_2 removed from the atmosphere by trees will be re-released if the trees are cut down or fall in severe storms, or are burned by humans or in wildfires. To solve this concern, the Parties agreed at the Ninth COP (COP-9) that credits arising from afforestation/reforestation projects under the CDM should only be temporary. Although the credits are temporary, it was determined that they could be re-issued or renewed (every five years) after an independent verification deems that sufficient carbon is still sequestered within a project to account for all the credits issued.

Credit for CDM projects is given in the form of CERs. There are two forms of CERs: temporary (**tCERs**) and long-term (**lCERs**). Both types of credits basically view carbon sequestration as providing an ecosystem service that can be rented or leased over different time periods. They are defined as follows[4]:

A "tCER is a CER issued for an afforestation or reforestation project activity under the CDM, which expires at the end of the commitment period following the one during which it was issued". For example, a tCER issued at some point in the commitment period 2013-2017 would expire at the end of the next commitment period, 2022. At this time, the tCER can be reissued (if verification has occurred) either to the same Annex I buyer or another buyer. The Annex I buyer must replace the expired tCER with either a tCER or with a credit from another mechanism. At the end of the crediting period, all tCERs expire.

An "lCER is a CER issued for an afforestation or reforestation project activity under the CDM, which expires at the end of the crediting period of the afforestation or reforestation project activity under the CDM for which it was issued". It is theoretically good for up to 20 to 30 years. lCERs must be replaced as soon as verification shows that the carbon stock has decreased, or if no verification has occurred for a period of five years. At the end of the crediting period, all lCERs expire. lCERs have variable expiration periods – for example, an lCER sold in year five of a 30-year project will have a duration of 25 years, while an lCER sold in year 10 of a 30-year project will have a duration of 20 years.

The tCERs and lCERs are discussed further in *Section 2.3 Step 10*.

1.2.3.2 Leakage

Although projects will most likely successfully sequester carbon within the project area, some projects may alter activities or behaviours elsewhere. These activities may lead to reduced sequestration or increased emissions outside the project boundary, thus negating a portion of the benefits of the project. This is called leakage.

Two types of leakage are generally recognised: that caused by activity shifting and that caused by market effects. A simple example of leakage from activity shifting is a project that reforests poor-quality grazing land, but leads owners of the displaced livestock to clear land outside the project boundaries to establish new pastures. An example of leakage caused by market effects is a project that reforests large tracts of productive beef cattle grazing land. The reduction in supply of beef signals the market, causing prices to increase, and land is cleared elsewhere for producing more beef.

BOX D: Leakage Assessment: Reforestation/Afforestation of Land Currently Under Agricultural Use (AR-NM0019)

AR-NM0019 (the number assigned to this project by the CDM Executive Board) allows for the calculation of leakage from displacement of agricultural activities, livestock and fuel wood, vehicle use, and increased use of fence posts.

The method for assessing the impact of displacement of agricultural activities involves tracking a proportion of the people displaced in the five years immediately after displacement. It is necessary to track what area each person deforests (if any). If the sampled people leave the area, then a conservative deforestation estimate is applied.

For leakage through the displacement of livestock, it is necessary to track numbers of livestock for the first five years after displacement. Leakage is estimated from decreases in numbers of livestock within the project boundary after the start of project activities, in combination with an ex-ante calculation of the required grassland area per head of livestock.

Leakage due to the displacement of fuel-wood collection is estimated through the average volume collected in the project area before the start of project activities, minus the volume collected within the boundaries after activity displacement.

For leakage due to fossil fuel use, the methodology requires tracking of distance travelled by project vehicles outside the project boundaries. Leakage is calculated by applying constants for fuel consumption and fuel emission factors.

Leakage due to the increased use of fence posts compares the perimeter of fencing before and after project commencement.

Total leakage is equal to the sum of each of the leakage components. Individual forms of leakage can be excluded and not monitored if it can reasonably be shown that the project will have no influence or will lead to a decrease in emissions.

Most projects under the CDM are unlikely to cause leakage from market effects. Activities that might result in leakage vary with the type of projects (see Box D overleaf); both LULUCF and non-LULUCF projects are subject to leakage. Leakage can often be minimised by good project design – for example, by including improved pasture management around a new forest so that displaced livestock can be accommodated without further clearing.

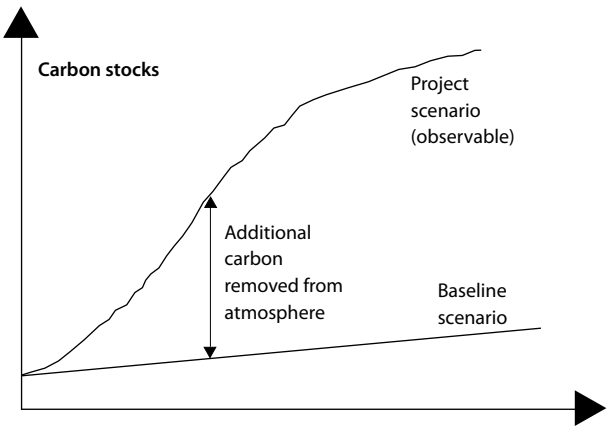
1.2.3.3 Baseline

Afforestation/reforestation CDM projects enhance greenhouse gas removals in one country to permit an equivalent quantity of greenhouse gas emissions in another country, without changing the global emission balance. Technically, the CDM is a baseline-and-credit trade mechanism, not a cap-and-trade mechanism. Therefore, enhancements of removals by afforestation/reforestation projects must create real, measurable and long-term benefits related to the mitigation of climate change (Kyoto Protocol, Article 12.5b), and must be additional to any that would occur in the absence of the certified project activity (Article 12.5c). The in-the-absence scenario is also referred to as the baseline or 'business-as-usual' scenario. The purpose of baseline analysis is to provide a transparent picture of what would have happened in the absence of the proposed project.

A baseline scenario must be derived using a baseline methodology approved by the CDM Executive Board. The scenario should be established in a transparent and conservative manner regarding the choices of approaches and assumptions. Every single project should define its own baseline. Advice on choosing an approved baseline methodology is given in *Part II*. In summary, the baseline must be the most likely course of action and development over time, in the absence of CDM financing.

As an example, the project scenario for most afforestation/reforestion projects will be planting and maintaining trees that grow into forest. The baseline may be the low carbon stocks present in croplands or grazing lands, each of which will be constant through time. Equally, however, the baseline could be the abandonment of the land and subsequent natural regeneration of trees. In this case, the additional carbon removed from the atmosphere is equal to the difference between naturally regenerating and planted trees.

The figure below shows the time-path of carbon stocks in the project and the baseline scenarios.



The baseline scenario can either be estimated and validated upfront, and then "frozen" for the first phase of the crediting period (30 years, or the first 20 years of a 60-year project), or it can be monitored during the afforestation/reforestion project. However, even in the latter case, it is still necessary to establish a methodology upfront on how to select the control plots and monitor them and it is also still necessary to provide an upfront estimation of the baseline, including the associated emissions and removals of greenhouse gases (although this upfront estimation is then only for information and not used for calculating emission reductions – the results of the monitored baseline would be used). The advantage of an upfront, estimated and "frozen" baseline is that there is greater certainty about the emission reductions generated by the project. This is the option that has been used by most projects to date and all currently approved methodologies (as of June 2006) assume baseline scenarios "frozen" during the crediting period.

Examples of baseline and project scenarios are outlined in Box E.

BOX E: Examples of baseline and project scenarios

San Nicolás CDM Afforestation Project
Country: Colombia
Project area: 8,730 hectares
Baseline scenario: Abandoned pastures with no current economic use and so no possibility for displacement
Baseline carbon stock: The stock of carbon in the pastures
Project: Forest and agroforest plantations

Pico Bonito National Park Reforestation
Country: Honduras
Project area: 2,600 hectares
Baseline scenario: Shifting agriculture
Baseline carbon stock: Conservatively estimated as the maximum stock recorded over the shifting agriculture cycle
Project: Reforestation with commercial plantations and natural forest restoration

1.2.3.4 Additionality

The CDM is a carbon-neutral process. It allows an Annex I country and a non Annex I country to co-operate on carrying out a project in the non-Annex I country that will sequester carbon (or reduce emissions). CERs are created through this project and transferred to the Annex I country, which is now able to emit an equivalent number of units of carbon while meeting its targets. Thus, the atmospheric concentration of greenhouse gases remains unchanged as a result of the transaction. The Annex I country is assisted in meeting its commitments cost effectively and, in well-designed projects, the non-Annex I country benefits in meeting its sustainable development goals.

If a potential project that sequesters carbon (or reduces emissions) would have taken place without the CDM transaction, then the emission reductions are not additional and the greenhouse gases in the atmosphere would increase as a result of the transfer of CERs[5]. For example, if an area would have been reforested either through deliberate management action or natural processes, irrespective of the CDM transaction, then if the CDM transaction was erroneously allowed to take place the Annex I country would emit more greenhouse gases and the atmosphere will have a higher level of greenhouse gases than it would have without the transaction. The purpose of the additionality clause in Article 12 of the Kyoto Protocol is to prevent this from occurring.

Some confusion has arisen because the definition of additionality, as agreed to, does not fully capture the core concepts. The definition agreed to at the Ninth COP (COP-9) in 2003 is: "The proposed afforestation or reforestation project activity under the CDM is additional if the actual net greenhouse gas removals by sinks are increased above the sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the registered CDM afforestation or reforestation project activity…", which focuses more on identifying the additional component than on the project eligibility.

It must be clear that additionality is not the difference between the baseline and project greenhouse gas emissions. Further guidance from the CDM Executive Board, and the recommended steps in dealing with additionality and baselines, is outlined in *Part II*, including an additionality test devised by the Executive Board.

The essential question that must be asked of each project is: *What quantity of carbon is being sequestered as a direct result of the CDM transaction, in anticipation of selling carbon offsets?* Only this quantity of CERs can be issued. This test applies equally to LULUCF and non-LULUCF projects.

Proving additionality is discussed further in *Part II*.

1.2.3.5 Land eligibility

There are two aspects of land eligibility that must be fulfilled by afforestation/reforestation projects.

The 31 December 1989 Rule

In practice, no distinction is made under the CDM between afforestation and reforestation. Therefore, the criterion that all projects must meet is that no land meeting the national definition of forest be present within the project boundaries between 31 December 1989 and the start of the project activity. In other words, land that is eligible for afforestation/reforestation CDM should have been: (a) non-forest on 31 December 1989; and (b) non-forest at the time of start of project activity. For the purposes of afforestation/reforestation, non-forest would be any area that does not meet the national definition of forest as communicated by the host party to the CDM Executive Board. The reason for this requirement was the fear that the CDM would create an incentive for land owners to cut down trees in order to make land eligible for credits that would arise if they replanted the land with trees.

Proof that land was non-forest can be provided in the form of aerial photographs or satellite imagery from 1989 or before, or official government documentation confirming absence of forests. Where proof of these types does not exist, then multiple independent, officially witnessed statements by local community members can suffice. Evidence of the continued absence of forest since 1989 will also be needed and can take similar forms.

Proving land eligibility is discussed further in *Part II*.

Definitions of forest

The decision of what constitutes a forest has implications for which lands are available for afforestation/reforestation activities. National presiding authorities in non-Annex I countries, known as Designated National Authorities (DNAs), have been given the role of deciding for their country where to lay the thresholds from the available range determined at COP-9, namely:

- Minimum tree crown cover value between 10 and 30 percent
- Minimum land area value between 0.05 and 1 hectare
- Minimum tree height value between 2 and 5 metres

The following are examples of the implications of forest definitions:

- A high crown cover definition may exclude agroforest projects, but a low definition may make it difficult to include degraded areas with sparse tree cover in the baseline.
- A high value for minimum land area encourages areas with real environmental and biodiversity benefits, but excludes typical community forests and agroforests around dwellings.
- A high tree height value may allow fruit trees as a baseline for reforestation, but could exclude agroforests or other low stature trees in the project scenario.

1.2.4 Added value to projects

For projects seeking to have a greater positive socio-economic and environmental impact, it is possible to register with one or more programmes that will give certification if criteria are met. Two notable programmes exist – the CDM Gold Standard (www.cdmgoldstandard.org) and the Climate, Community and Biodiversity (CCB) Standards (www.climate-standards.org).

In both cases, the Designated Operational Entity certifies that the enhanced standards are being met, at the same time as validating and verifying the project and the project certified emission reductions. Additional documentation will be required for certification. The standards may also be used at the project design stage to ensure positive socio-economic and environmental impacts. The project would then be able to decide at a later stage whether to follow through with actual certification.

The higher level certification will potentially make projects more attractive to investors eliciting a higher value for emission reduction or sequestration credits.

1.3 The ITTO Afforestation/Reforestation CDM Capacity-Building Initiative

The ITTO is an inter-governmental organisation comprising 59 member states that seeks to promote international trade in tropical timber as well as the conservation and the sustainable management and use of tropical forests. It develops internationally agreed policies to promote sustainable forest management and assists member countries to adapt and implement them in the field through projects.

In the area of rehabilitating forest lands, the ITTO recognises that forest degradation in the tropics has an adverse impact on the availability of forest resources, including timber and other forest resources used by local communities. Degradation also reduces biodiversity and forest cover, which critically impact upon climate change. Therefore, it is important to rehabilitate degraded forest lands in order to restore forest resources and maintain the flow of goods and services delivered by forests. Rehabilitation is also relevant to efforts for poverty alleviation and the improvement of the livelihood of communities living around and within forests.

The ITTO is concentrating its efforts on the implementation of the "*ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests*", which, *inter alia*, recommends the development of strategies and approaches to promote the role of degraded-forest restoration and secondary forest management for the international carbon trade, carbon sequestration and as carbon sinks.

In the relatively new field of CDM, the ITTO has promoted CDM forestry projects in a number of ways. Through its project programme, ITTO is providing fora on climate change and the tropical forest sector. For example, the ITTO *International Workshop on Climate Change and Forest Sector: Clean Development Mechanism in Tropical Countries* was organised in Seoul, Korea, in September 2004 by the Seoul National University in co-operation with the Korea Forest Research Institute, the Center for International Forestry Research and Swiss Interco-operation. This workshop identified two main obstacles hindering the development of afforestation/reforestation CDM projects. Firstly, the limited (or, in some cases, complete lack of) capacity on the side of project developers in non-Annex I countries to identify, formulate and develop sustainable forestry projects under the CDM. Secondly, the inability of developers to attract the necessary finances for the implementation of these projects.

A new phase of the ITTO's capacity-building project was initiated in late 2005 under project PD 359/05 Rev.1 (F), *"Building Capacity to Develop and Implement Afforestation and Reforestation Projects under the Clean Development Mechanism (A/R CDM) of the Kyoto Protocol in Tropical Forestry Sector"*. The general objective of this new project is to promote understanding of the rules and procedures for afforestation/reforestation CDM projects and to encourage country-level initiatives in promoting afforestation/reforestation CDM project activities. Specifically, the project intends to:

- enhance general knowledge about afforestation/reforestation CDM projects, including rules and regulations, the Project Design Document, and baseline and monitoring methodologies development;
- improve the capacity of project proponents to collect the data and information necessary for preparing an afforestation/reforestation CDM Project Design Document;
- promote the exchange of experiences in the development of afforestation/reforestation CDM projects;
- identify financial and investment issues relating to afforestation/reforestation CDM projects; and
- assist in raising finances for implementation of feasible afforestation/reforestation CDM projects through public-private partnerships that link host Parties with potential investor countries.

BOX F: ITTO Afforestation/Reforestation CDM Project Financing

In the area of forestry, climate change and the CDM, the ITTO has funded the pre-project, "*Promotion of the CDM in the Framework of Sustainable Forest Management with Local Communities Involvement*" (PPD 47/02 (F)), in Indonesia. This pre-project was submitted by the Government of Indonesia and implemented by the Association of Indonesian Forest Concession Holders (AHPI). It collected baseline data and information for the development of strategies and the formulation of a project proposal to promote CDM in the framework of sustainable forest management, with the involvement of local communities.

Another project funded by the ITTO is "*Alternative Financing Model for Sustainable Forest Management in San Nicolas*" (PD 54/99 Rev.1 (F)), which is currently entering its second phase (PD 240/03 Rev.1 (F)). CORNARE (Regional Autonomous Corporation of Rio Negro – Nare), the co-executing Swiss agency EMPA (Swiss Federal Institute for Materials and Technology Research and Testing), and the Valles de San Nicolas community in Colombia developed the pilot project in the San Nicolas region, with the objective of testing an innovative financing method that combines sustainable management of tropical forests with the potential that the CDM of the Kyoto Protocol offers the forest sector.

In addition, the ITTO also recognises the need to explore ways in which it can contribute to the development of an international policy framework relating to CDM forestry projects. Toward this end, an international workshop on *CDM – Opportunities and Challenges for the Forest Industry Sector in Sub-Saharan Tropical Africa* will be convened in Ghana in October 2006 under project PD 337/05 Rev.3 (F). This workshop will contribute to the deliberation of CDM forestry issues, including reducing emissions from deforestation. The ITTO will continue to encourage members to develop projects that provide a fora to address CDM forestry projects and the post-2012 climate change regime relating to deforestation issues, at both the national and regional levels.

1.4. Forest Landscape Restoration Framework as a Strategy for the CDM

Forest landscape restoration (FLR) provides a framework approach for the development and design of afforestation/reforestation projects under the CDM. FLR allows project developers to explore how to best generate environmental and social co-benefits in addition to carbon in afforestation/reforestation projects.

While the intent of an investor or CDM developer is maximising carbon sequestration within a project, there is a need to ensure to the maximum extent possible that the carbon sequestered is not lost due to external or local factors that may not have been taken into account during project design and in consultation with a wider range of stakeholders than the carbon purchaser. Within policy and technical circles, there remain questions as to the viability of afforestation/reforestation carbon sequestration projects. However, it is also important that additional applied experiences are generated to see what approaches may or may not work, and how to maximise benefits to host countries and communities. Such lessons are valuable for investors, policy-makers, host countries and host communities.

FLR is defined as a process that aims to regain ecological integrity and enhance human well-being in deforested or degraded forest landscapes. This approach focuses on restoring not just trees, but the integrity of the entire landscape, based on the desired socio-economic needs of the local beneficiaries and environmental and ecological values. The process is determined by stakeholders who live in, use or benefit from the landscape, or downstream users who may benefit from some of the functions, such as improved water flows that a restored landscape may provide, as well as technical specialists who can assist in analysing environmental or ecological potential.

As an approach to afforestation/reforestation projects, FLR should be strongly considered. Given that the afforestation/reforestation approach is new, it provides an opportunity to invest in learning about how various approaches may or may not work. In addition, FLR can help address various methodological issues related to afforestation/reforestation projects, such as additionality and permanence, while working to maximise the generation of long-term biodiversity, livelihood and carbon co-benefits.

More specifically, the FLR approach could potentially address the following methodological issues and risks of sequestration projects:

Leakage and additionality. Establish additional forest and carbon assets; restore ecological and social benefits. FLR is not business as usual, as it promotes change and incentives for maintaining forest assets.

Non-permanence. Promote land tenure and positive land use options; develop incentives for forest (and carbon) maintenance and protection; promote diverse forest species and forest functions.

Environmental and biodiversity co-benefits. Promote corridor restoration, fragment reduction, habitat restoration, resistance and resilience; increase species diversity; integrate ecological services, such as hydrologic regulation and soil stabilisation; control desertification; reduce pressure on natural forests and augment buffer zones; offset perverse incentives for natural forest conversion.

Social co-benefits. Enhance livelihoods through integrated land uses (agroforestry, timber and non-timber forest products, fodder, etc.); promote land tenure security by linking to policies to reduce negative land use, etc.; create partnerships for long-term gains.

Among the other outcomes particular to a given landscape, FLR afforestation/reforestation projects should do the following:

- focus on restoring forest functions and improving ecological processes at a landscape level (in line with biodiversity and environmental goals);
- address socio-economic and environmental dimensions (in line with livelihood goals and to help ensure carbon permanence);
- address root causes of degradation such as land tenure (in line with livelihood goals and to help ensure carbon permanence);
- increase forest resilience through enhanced connectivity and species diversity (to contribute to adaptation and biodiversity goals); and
- encompass a mixture of locally appropriate approaches.

Specific activities of any FLR afforestation/reforestation initiative, in addition to carbon sequestration, could include one or more of the following:

- rehabilitation and management of degraded primary forest;
- management of secondary forest;
- subsistence agriculture or market gardens;
- restoration of primary forest-related functions on degraded forest lands;
- promotion of natural regeneration on degraded lands and marginal agricultural sites;
- ecological restoration;
- diverse plantations and planted forests and;
- agroforestry and other configurations of on-farm trees.

FLR differs from conventional restoration approaches in several ways and offers an alternative vision by which to approach the design of afforestation/reforestation projects. It allows practitioners and community members to think creatively about what they want from their land and what is the optimum suite of goods and services they require in the short-medium and long-term. The FLR also provides an opportunity to have a more holistic vision of the landscape, and to move away from narrow or habitual viewpoints:

FLR takes a landscape-level view. This does not mean that every FLR initiative must be large-scale or expensive, but rather that site-level restoration decisions need to accommodate landscape-level objectives and take into account likely landscape-level impacts.

FLR does not necessarily aim to return forest landscapes to their original state, but rather is a forward-looking approach that aims to strengthen the resilience of forest landscapes and keep future options open for optimising the delivery of forest-related goods and services at the landscape level.

FLR is a collaborative process involving a wide range of stakeholder groups collectively deciding on the most technically appropriate and socio-economically acceptable options for restoration.

FLR operates on the principle of balance. That is, restoration efforts need to result in both improved ecological integrity and enhanced human well-being at the landscape level.

FLR can be applied not only to primary forests, but also to secondary forests, forest lands and even agricultural land.

FLR can be implemented in a phased approach so that certain elements can be initiated immediately for immediate stabilisation and short-term needs, such establishing vegetation cover to stem erosion, followed by the integration of tree crops or timber species.

FLR is adaptive and responsive to peoples' needs and can be modified by stakeholders over time.

Balancing trade-offs

In any project design, there will likely be a need to negotiate trade-offs between different needs and priorities and to search for compromise. The needs of the project proponent in terms of carbon must be balanced against the socio-economic and environmental needs of the landscape and the people who depend upon it for livelihood or commercial needs. On a landscape scale, it may be easier to take into account various economic and environmental needs and to balance these off across different, yet inter-related, sites across the landscape.

The FLR approach recognises the need to enhance human well-being and to restore long-term ecological integrity at the landscape scale. These two elements are considered a "double filter" or, more simply put, a balanced approach through which to screen and assess various land-use options. The double-filter acknowledges the inevitability of some site-level specialisation, such as plantations, and that trade-offs between economic, social and conservation values of the land will have to be considered.

However, the double filter also reflects the notion that individual, site-level trade-offs must be balanced at the landscape level; it also accommodates and encourages adaptive management. One problem in trying to achieve balanced outcomes through the restoration of degraded forest landscapes is that land-use policies, markets, stakeholder groups and even ecosystems change over time.

FLR is rapidly emerging as pragmatic and forward-looking approach to deal with forest loss and degradation worldwide. Recognising that tree cover no longer dominates many tropical forest landscapes, and that local land-use patterns have led to a dramatic and detrimental reduction in the availability of forest goods and services both locally and beyond, FLR focuses on restoring forest functionality; that is, the goods, services (such as carbon) and ecological processes that forests can provide at the broader landscape level, rather than solely promoting increased tree cover at a particular location.

FLR acknowledges the reality that a typical forest landscape today is more likely to be a mix of primary forest, managed forest, secondary forest, plantations and degraded forest lands interspersed with extensive areas of other non-forest land uses. It recognises that the livelihood and land-use strategies of the communities living in these landscapes are determined more by real-life trade-offs rather than any direct motivation to return forest landscapes to their original pristine state. FLR is hence an approach that seeks to put in place forest-based assets that are good for both people and the environment. It incorporates a number of existing rural development, conservation and natural resource management principles and approaches to restore multiple forest functions to degraded landscapes. However, there is no set blueprint for FLR. Restoring forest functionality to a landscape has to be built around a collaborative process of learning and adaptive management.

Elements of the Forest Landscape Restoration Framework

RESTORING	**Benefits for people such as:** Products for food and raw materials; Reducing risk of landslides; Providing recreational areas; Providing clean water. **Environmental functions such as:** Hydrological cycles; Habitats; Nutrient cycling; Soil stabilisation; Carbon sequestration.
CONNECTING	**Forest fragments** and creating links between protected areas and well-managed forests.
REDUCING	**Vulnerability of forests and biodiversity** to threats such as: climate change, pests/ disease and fires.
PLANNING, IDENTIFYING AND ADDRESSING	**Solutions that are acceptable to all; Root causes of forest loss and degradation** in order to reverse trends through: Consulting and involving local people; Changing policies related to land use; Replacing harmful incentives with more positive ones; Informing and training people; Building capacity; Recognising traditional values.
VALUING	**Forest goods and services** in order to quantify and evaluate how stakeholders can directly benefit from these.

PART II: A STEP-BY-STEP GUIDE TO DEVELOPING AFFORESTATION AND REFORESTATION CDM PROJECTS

2.1 Overview of the CDM Project Cycle

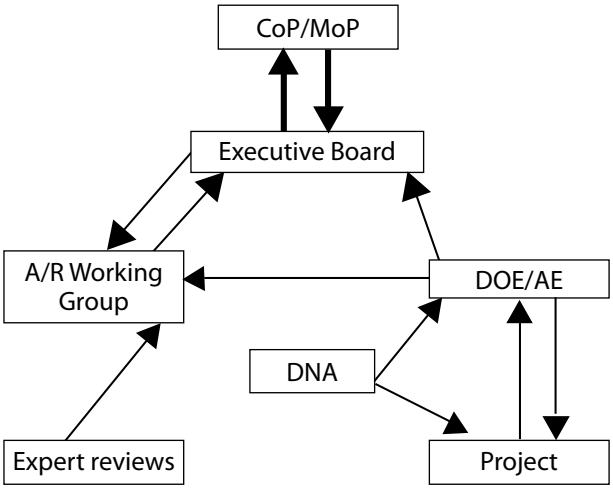
The ultimate governing body of the CDM is the Conference of the Parties/Meeting of the Parties to the Kyoto Protocol (COP/MOP). The COP/MOP is the annual meeting of the signatories to the Kyoto Protocol and is responsible for managing the CDM Executive Board and for overseeing its work.

The Executive Board supervises the CDM process under the authority and guidance of the COP/MOP; it is fully accountable to the COP/MOP. The Board decides on rules for the implementation of the CDM, as well as making the final decisions about acceptance of methodologies, registration of projects and issuance of CERs. The Board is composed of 10 members and 10 alternates.

The CDM Executive Board created an A/R Working Group to specifically oversee LULUCF under the CDM. The A/R Working Group provides guidance to LULUCF project developers and, using expert reviewers, makes recommendations on acceptance or rejection of LULUCF methodologies.

Designated Operational Entities, or DOEs, function as auditors for the CDM process. Designated Operational Entities are a domestic or international legal entity, accredited and designated by the Executive Board. They have two key functions: 1) to validate CDM projects prior to project implementation, and 2) to verify and certify emissions reductions after project implementation. An Applicant Entity (AE) is an entity undergoing the approval process to become a Designated Operational Entity. A list of Designated Operational Entities and Applicant Entities can be found on the UNFCCC CDM website (http://cdm.unfccc.int/DOE).

Along with approval and registration by the CDM Executive Board, projects must also be approved by the country in which the project is taking place. The government of each country that is signatory of the Convention will have assigned, or be in the process of assigning, a Designated National Authority or DNA (the UNFCCC National Focal Point takes on this role). The purpose of the Designated National Authority is to review projects and ensure they are in line with the country's development objectives and national laws. A "host country letter of approval" from the Designated National Authority is required for project registration. Each country may also have its own regulations that must be met to obtain a letter of approval. A list of the Designated National Authorities can be found on the UNFCCC CDM website (http://cdm.unfccc.int/DNA/).

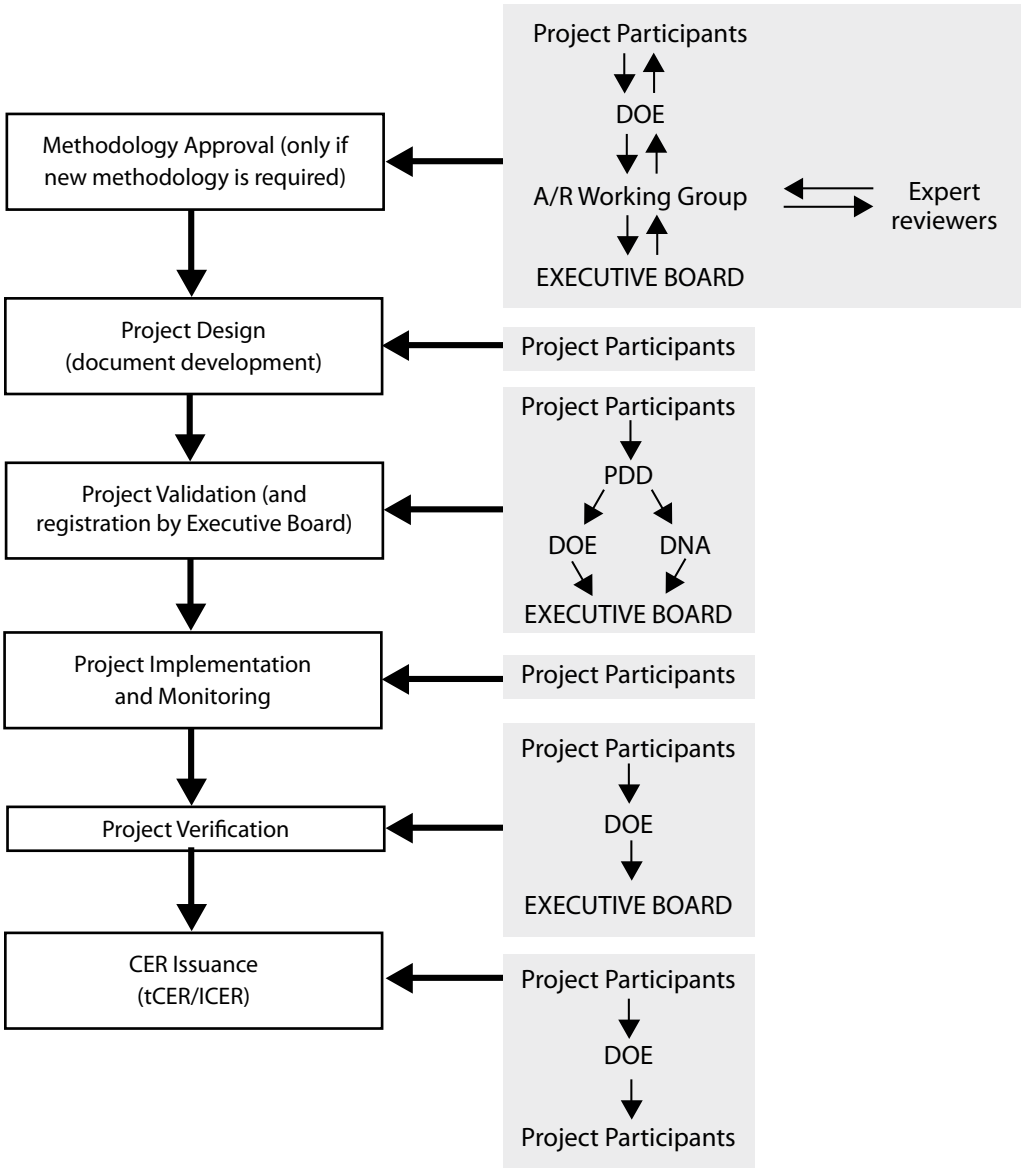


The core of any CDM project is the Project Design Document. The Project Design Document defines the project in terms of activity, length, eligibility, crediting choices, impact and chosen methodology. Creating the Project Design Document is the focus of *Section 2.3*.

The Project Design Document is prepared by the project participants and submitted to a Designated Operational Entity for validation. Validation is the focus of *Section 2.4*. Once validated by the Designated Operational Entity (providing there are no objections from the CDM Executive Board), the project is registered and can begin to compile CERs.

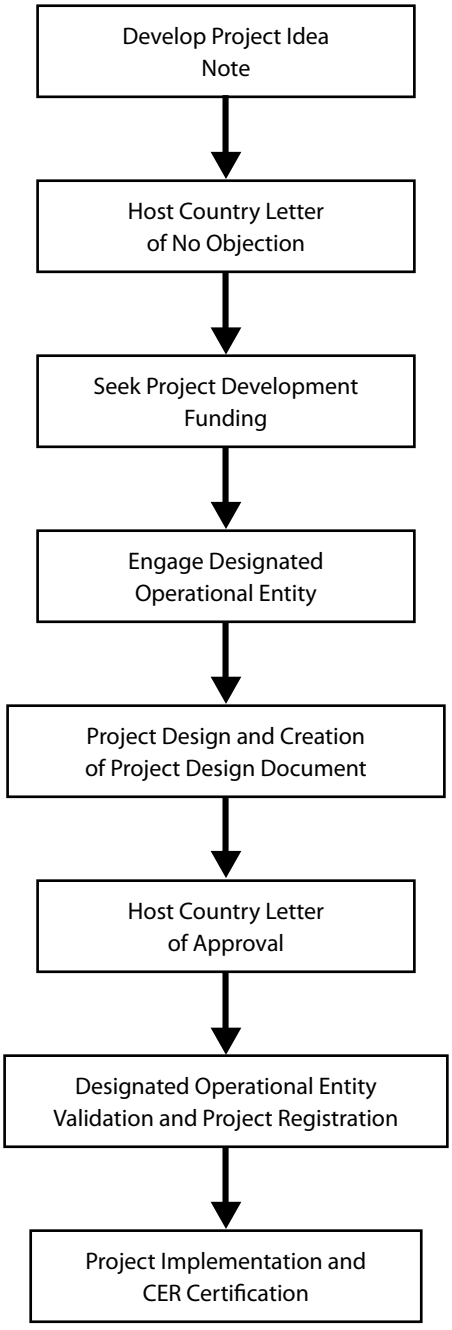
The methods described in the Project Design Document and implemented by project participants during the project establishment and monitoring are prescribed under the CDM. A project must apply a methodology that has already been approved by the Executive Board. If no suitable methodology exists, the project is obliged to submit its own methodology for approval. This is a long and costly procedure and should be avoided if possible.

Verification of sequestered carbon is also the responsibility of the Designated Operational Entity. Upon verification, the Executive Board can issue tCERs or lCERs. The following diagram illustrates the steps for, and players involved in, project registration and the issuance of CERs.


Methodology Approval (only if new methodology is required)
Project Participants
DOE
A/R Working Group
EXECUTIVE BOARD
Expert reviewers
Project Design (document development)
Project Participants
Project Validation (and registration by Executive Board)
Project Participants
PDD
DOE
DNA
EXECUTIVE BOARD
Project Implementation and Monitoring
Project Participants
Project Verification
Project Participants
DOE
EXECUTIVE BOARD
CER Issuance (tCER/ICER)
Project Participants
DOE
Project Participants

2.2 Critical Steps for Project Approval

There are eight critical steps in afforestation/reforestation project development and approval, which will be discussed in *Section 2.3* and are as follows:



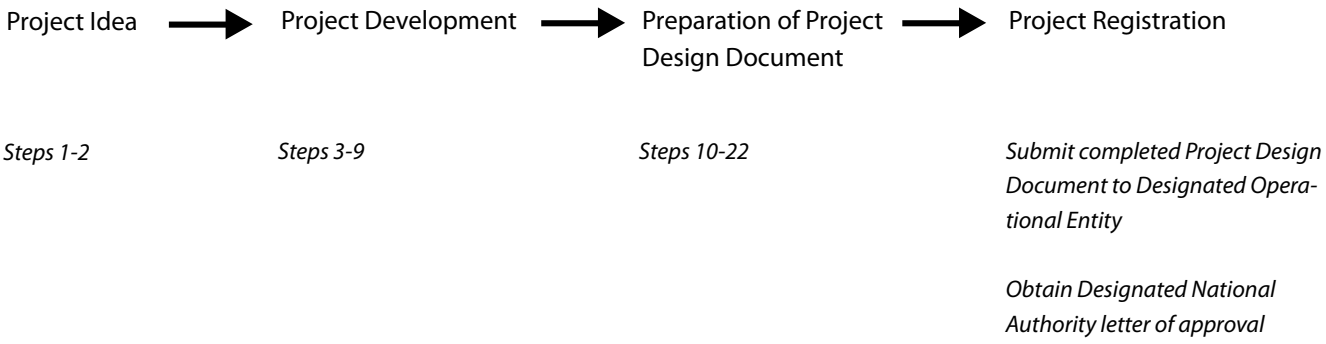
Obtaining a host country letter of no objection at this early stage informs the Designated National Authority of your plans and prevents future unpleasant surprises.

Entering into an early dialogue with the Designated Operational Entity is advantageous for obtaining advice on choice of methodology and potential future pitfalls.

The letter of approval is critical. Without it, the project cannot be registered.

2.3 Project Design and Development

2.3.1 Steps in Identification and Preparation of the Project



PROJECT IDEA

Step 1: Identify goals of project activity

To help ensure a successful project, the CDM project developer should determine the goals of the project activity.

Determine if the primary goal is:

- Financial profit;
- Providing income for disadvantaged communities;
- Environmental; or
- Greenhouse gas reductions.

The project developer should also determine whether the project location has been fixed prior to the start of project planning or whether it can be chosen to maximise the primary goal.

Each of the goals has merit, especially as they each will, in most cases, be intrinsically linked. However, it is important to identify the primary goal as this will strongly drive decision-making.

Financial profit

Financial profit has often been a strong driver for CDM projects to date, particularly for investors. LULUCF projects can, theoretically, be profitable. If profit is the motivation, developers should seek sites with minimal risk of leakage, but with relatively easy access and low costs of labour. Profitable projects will typically involve large-scale timber plantations.

Providing income for disadvantaged communities

Sustainable development was envisaged as a central component of all CDM projects and all well-designed projects should positively impact communities – at a minimum providing work and income. Other impacts could be slowing erosion and degradation, protecting critical water supplies, providing a source of wood fuels and providing alternative livelihoods. Projects with the highest impact are likely to be in areas where significant populations exist. Consequently, such projects present an elevated risk for permanence and leakage. Agroforests will usually form a component in community development projects.

Environmental

Environmental impacts can overlap with community impacts – for example, where watersheds are improved and/or erosion and degradation are halted. However, the projects with perhaps the greatest environmental impact will involve reforesting with native tree species, restoring historic forests and enhancing biodiversity. Such projects are unlikely to be profitable and, beyond the labour for forest establishment, will provide little direct financial benefit to local communities.

Greenhouse gas reductions

Greenhouse gas reduction benefits will often overlap with profit, in that maximising carbon credits is likely to maximise profits. However if profit is the motivation, then the destination of wood products will not be considered and the long-term status of the site beyond the crediting periods will not be an

important consideration for the developer. Without these considerations, the sequestered carbon will likely be returned to the atmosphere.

For projects with an explicit community or environmental purpose, it may be advantageous to consider certification under the CDM Gold Standard (www.cdmgoldstandard.com) or the CCB Standards (www.climate-standards.org), as this can increase the attractiveness of the project to investors.

Step 2: Develop Project Idea Note (PIN) or project proposal

Although not a required document, developing a project proposal or Project Idea Note will help solidify the proposed components of the CDM project. Having an established Project Idea Note may also assist project participants in securing investment funding for the project and in discussions with the Designated National Authority and potential regional and local stakeholders.

The Project Idea Note should describe the general goals of the project, what activities will take place to achieve those goals, who potential project participants and stakeholders are, the potential project location, the length of the project, other socio-economic and/or environmental benefits, and, if possible, a very broad first estimate of potential CERs. A good Project Idea Note would comprise approximately five pages.

A Project Idea Note will serve as the first form of contact with potential buyers, and will allow project developers the benefit of receiving early feedback on whether the project is of interest to buyers. A critical early step in the preparation of a Project Idea Note is to examine the feasibility of a specific project in the chosen region. This would involve an examination of potential financing and potential sequestration.

Checklist for the Project Idea

1. **Determine the *primary* goal of the project:**
   A. financial;
   B. developmental;
   C. environmental; or
   D. greenhouse gas reductions.
2. **Based on this goal, determine the most appropriate afforestation/reforestation activity.**
3. **Locate a region in which the greatest impact can occur at a cost that is not prohibitive.**
4. **Prepare Project Idea Note (about five pages).**

PROJECT DEVELOPMENT

Step 3: Secure project financing sources

For a CDM project, start-up costs will amount to tens of thousands of dollars. This money is necessary to design the project, gain approval from the host country and achieve validation from a Designated Operational Entity. Therefore, project financing will be required well in advance of the expected pay-outs resulting from the sale of CERs.

These start-up funds may be provided by upfront payments for credits, however this form of financing is rare as it is unlikely that an investor will be willing to take on the project risks. Instead, in most cases, funds must be found from grants or loans.

Financing should be researched in the following order:

- Countries, companies or organisations that will pay upfront for credits;
- Grants for project development from overseas governments, charitable organisations or charitable arms of companies;
- Loans from international, national or local banks.

See *Part III* for more information on CDM financing.

Step 4: Design project management structure

The next critical step in project development is determining the project management structure. No successful project, particularly in LULUCF, can be solely driven from a distant, industrialised country. It is very important to have motivation and capacity in the project host country. Projects that are designed top-down are doomed to struggle, whereas bottom-up projects will be driven locally at the site where the impacts will be felt and where the required information and data will be derived. On the ground, host country capacity is required in both the understanding of forestry and forestry techniques and in English, which is the sole working language of the CDM Executive Board (although the Project Design Document is available in all six UN official languages).

Step 5: Determine local, regional and national requirements for project development

It is strongly advised to investigate local, regional and national requirements for the anticipated project activities prior to committing substantial resources to project development. These requirements could be specific to the activity, such as regulations governing forest establishment or forest management, as well as CDM-specific regulations.

Step 6: Obtain a "letter of no objection" from the Designated National Authority

An important project partner will be the UNFCCC National Focal Point in the host country, which is also the Designated National Authority. The Designated National Authority can prevent a project from being registered if it has any objections, therefore it is important to find out all requirements of the Authority for CDM projects. The Project Idea Note can be used to introduce the Designated National Authority to the project and to assist in obtaining the host country letter of no objection at this early stage. This step will also inform the Designated National Authority of project plans and may help prevent future unpleasant surprises.

Step 7: Select appropriate methodology

Whenever possible, project developers are strongly advised to use to apply an existing approved CDM methodology, as submitting a new methodology to the CDM Executive Board has very large time and financial requirements, and requires a very high level of technical capacity. In addition, it is likely that by the end of 2006 there will be in excess of seven approved afforestation/reforestation methodologies, which should cover most project scenarios. Guidance is therefore given here on how to select from the existing list of approved methodologies to apply to a project. If, however, your project is not eligible to use any of the approved methodologies, it is advised you contact a consultant organisation. The approved methodologies can be downloaded from the UNFCCC CDM website (http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html).

Entering into an early dialogue with the Designated Operational Entity is advantageous, as they can advise on choice of methodology and potential future pitfalls. The Designated Operational Entity can also inform the project developer of exactly what documentation will be required during the certification process.

The first step when considering methodologies is to examine the applicability conditions. These can be found in Section I.3 of each approved methodology document. The applicability conditions must fit your project exactly. If every applicability condition is not satisfied, then that methodology cannot be used.

Project developers should also consider the following:

Advantages and disadvantages of small-scale project activities

The first choice is whether or not to use a small-scale methodology. Electing to be "small scale" limits the project to a sequestration of no more than 8,000 t CO_2-e per year. Depending on the species, planting density and climatic conditions, this could be a project of between 200 and 1000 hectares.

Currently, there is one approved simplified baseline and monitoring methodology for selected small-scale afforestation and reforestation project activities under the CDM, which can be found at: http://cdm.unfccc.int/methodologies/ARmethodologies/AR_SSC_Annex_II.pdf.

The limitation in annual sequestration potentially limits the profitability of small-scale projects. There are significant start-up costs, even for small-scale projects, and it is harder to justify these with the resulting small scale of sequestration. However, the methodologies used for small-scale afforestation/reforestation projects represent some significant simplifications over the requirements for large-scale projects. For example, methodologies for baseline setting, proving additionality and calculating leakage are simplified.

It is allowable for an organisation(s) to aggregate or bundle multiple small-scale projects together to maximise efficiency and minimise transaction costs (especially in validation and verification). However, the bundled, small-scale projects cannot be merely a debundled, large-scale project. At a minimum, the boundaries of the small-scale projects should be separated by at least 1km or have different participants (aside from the bundling organisation and the host country).

Potential for leakage

For afforestation/reforestation projects that are not small scale, a significant factor in determining which methodology is most applicable is whether or not there is a significant risk of leakage through activity shifting. Any activity due to the project which will potentially cause greenhouse gas emissions outside the project area must be monitored to assess leakage. Common activities that will need to be monitored include grazing, firewood collection and agriculture. Projects with no activity shifting include projects with no activities currently taking place on the project lands, or projects in which any current activities are not shifted outside of the project boundary. As an applicability condition, the first approved afforestation/reforestation methodologies (AR-AM0001

and AR-AM0002) require no activities to be shifted outside the project boundary. AR-AM0003 monitors displacement of livestock grazing and agricultural activities, fuelwood collection activities and increased consumption of wood posts for fencing.

Choice of pools

Another important choice in determining which methodology to apply is the selection of carbon pools for measurement. Pool choices include: above-ground biomass, below-ground biomass, dead wood, forest floor (litter) and soil organic carbon.

At COP-9, it was determined that "project participants may choose not to account for one or more carbon pools… subject to the provision of transparent and verifiable information that the choice will not increase the expected net anthropogenic greenhouse gas removals by sinks". Therefore, project developers can choose to exclude carbon pools listed in a methodology as long as it can reasonably be shown that the pool will not be smaller in the project than in the baseline.

Trees will form the dominant carbon pool and are relatively simple to measure. Below-ground biomass is typically calculated, rather than measured, and so there is little reason to exclude it. Therefore, all projects should include above- and below-ground components of trees. The decision whether to include other pools will be up to each project and the methodology chosen. If any pool will be subject to a loss in the project, then it must be measured. For example, where grasses are replaced by trees, there is a risk in some parts of the world of a loss in soil organic carbon.

The potential CERs from the inclusion of a pool need to be compared against the cost of measuring and monitoring that pool with the needed precision. In most projects with a duration of between 20 to 60 years, it is unlikely that sufficient carbon will be sequestered in dead wood, forest floor or soil organic carbon to justify the expense of monitoring.

Each methodology has a defined list of selected pools in Section I of the methodology. If a developer is intending to include pools in a project that are not included in the CDM methodology, then the project will not be eligible to use that methodology. For example, AR-AM0001, AR-AM0003 and the small-scale afforestation/reforestation methodology include only above- and below-ground carbon pools. Thus, if a project chose to monitor soil organic carbon, then it could not use any of these methodologies[6]. In contrast, as noted above, if it is decided to omit a carbon pool listed in the methodology for a CDM project, this is allowed as long as it can be documented that the pool will not be smaller in the project than in the baseline. AR-AM0002 includes all pools: above-ground, below-ground, forest floor, deadwood and soil organic carbon.

Step 8: Determine project location

If the project location has not been fixed prior to the start of project design, then there is the opportunity to make a project location selection that maximises potential carbon sequestration and minimises start-up costs. To do so, take the following five steps when making the exact project location selection:

1. Assess sequestration potential;
2. Assess eligibility requirements;
3. Assess additionality requirements;
4. Assess environmental and socio-economic impacts; and
5. Assess ability to minimise leakage.

Assess sequestration potential

Physical and human factors will impact the potential sequestration at a project site. Consideration should be given to planting species, topography, slope, elevation, soil fertility, soil water availability, threat of fire, threat of strong winds, threat of poaching of wood stocks and threat of livestock encroachment.

Assess eligibility requirements

The project location should not be chosen without obtaining prior knowledge of the eligibility of the land. If the area was deforested within the last 20 years, then the entire site might be ineligible. Complex satellite analysis will be required to show the fragments of the land that are, and are not, eligible. The project developer should conduct a simple analysis of imagery from the late 1980s and select deforested areas from that imagery for the choice of project location. Documentation will also be needed to show the land has not been covered by forest at any time since 1990. This can take the form of imagery or other documentation.

Eligibility also considers whether the site is below the national thresholds that define a forest. Even if the site does not currently represent your image of a forest, it may still not be eligible because it does not meet the thresholds determined by project host country. The existence of fruit trees or

natural regeneration should be warning flags to any project developer that proving eligibility of the site could be a challenge. See *Step 14* for further considerations on proving eligibility.

Assess additionality requirements

The additionality of the afforestation/reforestation activity should also be considered when selecting project location. For example, additionality may be a problem if there are national, regional or local government requirements for reforestation in the project area (that have been in place since before 11 November 2001[7]) or if, in the area, timber plantations (such as are being planned for the project) are being established without CDM funding. Without a straightforward additionality argument, a project will not be validated and registered. See *Step 13* for further details on proving additionality.

Assess environmental and socio-economic impacts

Any possible negative and positive environmental and/or socio-economic impacts that the project may have on the surrounding area should be considered. Environmental impacts include erosion, impacts on water quality and water supply, impacts from fire and disease risk, and biodiversity impacts. Socio-economic impacts include impacts on local community employment and livelihoods and access to socio-economically valuable resources. It may be possible to alter the location of the project to minimise any possible negative impacts and to maximise positive impacts.

At this stage, it is also important to involve the local community and ensure there are no local objections to the project. Local support will greatly aid project validation and if there are objections, it is important to deal with them immediately.

Assess leakage potential

The extent of possible leakage in the proposed project location should be examined. For example, the extent of pre-project activities taking place on the land should be assessed. Additionally, assess the availability of surrounding lands in which potential leakage-prevention measures could take place, and the area and type of land cover on lands where pre-project activities could potentially be displaced.

Checklist for Project Development

1. **Establish project finance.** Research in the following order:

A. Countries, companies or organisations that will pay upfront for credits;
B. Grants for project development from overseas governments, chari-table organisations or charitable arms of companies;
C. Loans from international, national or local banks.

2. **Design project management structure.** Ensure:

A. A division of responsibility for both management- and decision-making;
B. Adequate expertise in forestry and forestry techniques;
C. High capacity in writing and speaking English.

3. **Investigate local requirements:**

A. Designated National Authority requirements for CDM projects; obtain "Letter of No Objection" from Designated National Authority;
B. Local, regional and national laws and regulations for LULUCF.

4. **Select approved CDM methodology with the following considerations:**

A. Determine if project is large- or small-scale. Consider a project composed of bundled small-scale projects if sites are located at least 1km apart.
B. Examine existing approved CDM methodologies and, in particular, applicability conditions to see if they apply to your project. In particular, consider the carbon pools selected and the potential for leakage.
C. Engage Designated Operational Entity and discuss methodology selection.

5. **Determine project location taking into consideration:**

A. Sequestration potential;
B. Land eligibility (that the area was indisputably not forested in 1990);
C. Additionality (that the activity would not have occurred without the potential for carbon credits);
D. Environmental and socio-economic impact;
E. Potential for leakage.

Step 9: Engage Designated Operational Entity

Begin contract negotiations with the Designated Operational Entity, using the Project Idea Note to familiarise them with the project. Entering into an early dialogue with the Designated Operational Entity is advantageous, as they can advise on choice of methodologies and the types of documentation that will be required during project validation and registration.

PREPARATION OF PROJECT DESIGN DOCUMENTS

Step 10: Choose tCERs or lCERs

In response to the permanence issue for LULUCF projects, two types of CERs were created – temporary (tCER) and long-term (lCER) (*Section 1.2.3.1*). For both types, there is a choice between a single crediting period (to a maximum of 30 years) or a period of 20 years, with the possibility of renewing twice (for a total of 60 years).

Once a CER crediting period is over, the Annex I country must replace this carbon either by purchasing another CER or through the use of Joint Implementation or International Emissions Trading mechanisms. When either type of CER is retired (that is, not sold again), the CDM regulations on that tCER or lCER will cease and the developer is free to harvest the trees if desired. LULUCF tCERs and lCERs cannot be interchanged with CERs issued from energy or industrial sectors and, due to their temporary nature, will be sold at a lower price.

The tCERs

- Expire at end of following commitment period;
- Can be reissued (after verification);
- Must be replaced by buyer when expired with another tCER or an alternative credit;
- Have fees charged for issuance every five years;
- Expire at end of crediting period;
- Provide freedom for project operators, who can retire credits if they choose to harvest or discontinue an area.

The lCERs

- Expire at end of crediting period (20 or 30 years);
- Must be replaced as soon as verification shows carbon stock has decreased, or if there is no verification;
- Are of variable lengths (e.g., an lCER sold after five years might have a duration of 25 years, while one sold after 10 years could last 20 years, etc.);
- Will vary in price based on duration of credit;
- Will have higher prices if long-duration credits, with the benefit of bringing income to project in initial years.

Therefore, lCERs will likely receive a higher price, but commit the carbon for the length of the crediting period. This gives less freedom to the project operator and increases the risks from natural events (lCERs will immediately expire if verification is unsuccessful). Consequently, the default choice for most projects will be tCERs.

Step 11: Decide project duration

Multiple choices exist for project duration, although no project is eligible for crediting for more than 60 years. After initial validation, projects can continue to accumulate CERs for 20 to 30 years without the need for revalidation. If 30 years is selected as the project duration, revalidation is not an option and the project will end at this point. If 20 years is selected, revalidation can occur up to twice to give a total possible project length of 60 years. If the renewable crediting period is selected, then at 20 years (and 40 years), a Designated Operational Entity must determine that the original baseline is still valid.

Uncertainties in the climate system are large and it is unlikely that in 60 years, or even 40, that the CDM will still be functioning under current regulations. An argument can therefore be made for the selection of the single, fixed, 30-year period, which removes the cost and potential risks of revalidating after 20 years.

Step 12: Define project boundary

When the project site, baseline and monitoring methodology have been selected, the next step is to define the project boundary. The project boundary should geographically delineate all sequestrations and emissions that are significant, can be attributed to the project and are under the control of the project participants. Under control typically means that the project operator financially controls the emission or sequestration activity. For example, the project operator will control the growth of trees and use of fertiliser (with the associated emissions) to enhance growth. However, he or she does not control the emissions caused by people physically displaced from the project site by the project activity.

The project boundary can include one, or more than one, discrete area(s) of land or parcel. For afforestation/reforestation projects, the boundary is typically simpler than for many energy projects where supply- and delivery-side emissions are complications. In reality, it is often advised to make the

perimeter of the areas that will be planted with trees the boundary of afforestation/reforestation projects.

Consideration must also be given to the Designated National Authority's definition of forest in the host country; no one discrete project parcel can be smaller than the minimum area for forest definition[8].

Project developers should delineate the boundaries of the project ideally using a global positioning system (GPS), or alternatively on a map or georeferenced remote sensing image, prior to submitting the Project Design Document to the Designated Operational Entity for validation. Depending on the methodology used, it may be possible to add in additional areas after the time of validation (e.g., allowed under AR-AM0003).

Step 13: Apply additionality tool

The A/R Working Group, together with the CDM Executive Board, prepared a tool to demonstrate the additionality of projects specifically for the LULUCF sector. The A/R Working Group recommends using the Additionality Tool, although it is not required[9]. The tool can be found at: http://cdm.unfccc.int/EB/Meetings/021/eb21repan16.pdf. A summary of the tool is also included in *Annex E*.

At the heart of the tool is the choice to prove additionality through either a financial test or a barriers test, or both. The financial test shows that the project activity is economically less desirable than alternative land uses. The barriers test shows there are barriers[10] to the implementation of the project activity that can only be overcome with CDM finances, and that are not present for at least one alternative land use. The financial test is simple to pass for native forest restoration, but could be more difficult for timber plantations and agroforests. The barriers test will apply to most projects, particularly those with a large social impact.

It is not advised to select both the financial test and the barriers test, or to select multiple barriers, as proof will be required at validation by the Designated Operational Entity for all tests included in the Project Design Document.

The approved methodology chosen by the project will state whether the approved additionality tool or an alternative method must be used to prove additionality. It is unlikely that any will fail to propose the afforestation/reforestation Additionality Tool. However, if an alternative approach is required, this must be followed. If additionality cannot be proven, the project cannot go ahead under the CDM.

Step 14: Apply land eligibility tool

There is a mandatory tool for the demonstration of the eligibility of land for afforestation/reforestation projects. The tool must be applied in full in the Project Design Document. It can be found in Section A.4.5 of the Project Design Document, in *Annex E* and at: http://cdm.unfccc.int/EB/Meetings/022/eb22_repan16.pdf.

The tool requires proof that the area is not currently forest, that it was not forest on 31 December 1989, and that at no intermediate time was it forested and subsequently deforested. This is to be proven either through government documents (the simplest option) or through aerial photographs or satellite imagery complemented by ground reference data. If neither government evidence nor aerial photographs or satellite imagery is available for on or before 31 December 1989, then the option remains of a written testimony produced "following a rural appraisal methodology".

In practice, satellite imagery (e.g., Landsat) is available for most of the world for the late 1980s and can incontrovertibly show lack of forest where the situation is unambiguous[11]. Analysis should be through a supervised classification. It is useful if aerial photographs or other evidence is available to reinforce the classification. Present ground reference data can be used where you have confidence of continuous deforestation beyond the imagery date[12].

Typically, a second image or set of documents is required from a more recent date to show the continuous absence of forest.

Step 15: Conduct baseline assessment and estimation of project sequestration

A baseline study is required and will form the basis of Annex 3 of the Project Design Document. For the baseline study, it is necessary to follow the selected methodology. The baseline study will define the baseline strata and any emissions or sequestration under the baseline scenario.

It is also necessary to estimate the likely sequestration over the lifetime of the project. This is just an estimation, however the anticipated growth rate of the trees should be considered, along with all project emissions including leakage.

Step 16: Develop leakage mitigation plan

Strategies must be developed to prevent leakage from occurring in the proposed project area. If the proposed project area is currently being used by community members, alternative

livelihood activities must be created or alternative lands found that minimise the amount of leakage that may take place. For these measures to be successful, they must be both implemented, and continued over the life of the project. This requires strong community support and, ideally, the measures will be positively impacting the livelihoods of the community members. The types of leakage mitigation strategies will be dependant on the pre-project activities, but may include such things as: programmes to increase income or crop yields on non-project lands, or the introduction of alternative livelihoods (e.g., bee keeping, tilapia fish farms, agroforest plantations).

Step 17: Carry out environmental and socio-economic impacts analysis and stakeholder consultations

Sections E, F and G of the Project Design Document have the goal of illustrating analysis of environmental and socio-economic impacts and demonstrating that stakeholder consultations have occurred at the project site. Each must meet the requirements of the host country. It is good practice to state the legal requirements and how these have been met. Consult with the Designated Operational Entity on the type of documentation that project participants may be required to provide.

Environmental impacts

A formal assessment must be prepared concerning the possible project impacts on the environment. Assessed impacts should include water quality and supply, fire risk, erosion risk, air quality, nutrient/fertiliser run-off risks and endangered species. If there are any negative impacts, mitigation efforts should be carefully designed.

The Designated National Authority should be consulted to determine whether the host country requires that a formal Environmental Impact Assessment is conducted.

Socio-economic impacts

This formal assessment should include possible impacts on indigenous peoples, local employment, food production, access to cultural sites, religious sites, fuel wood and other forest products. It may be recommended to conduct a Participatory Rural Appraisal. The Designated Operational Entity may request official documentation stating that the project will not have any negative-socioeconomic impacts, therefore working with local government officials throughout the project development process will be beneficial.

Stakeholder consultations

Stakeholders must have the opportunity to comment on the Project Design Document. In addition, meetings must be held with stakeholders prior to project registration. Designated National Authority representatives should be invited to these meetings, if possible. The Project Design Document should describe the process by which stakeholders were involved with the project, how comments were invited and compiled, and a summary of the comments must be included. Documentation of stakeholder consultations should be available for the Designated Operational Entity to examine.

Step 18: Analyse risk and plan mitigation

Project participants bear the consequences of the risks to their activities. If an environmental or meteorological disaster occurs, or if human effects negatively impact stored carbon, then lCERs will be cancelled or fewer tCERs will be available for sale.

Part of risk mitigation lies in the positioning of the project. Project location will influence risk of fire or storms, the risk of leakage or other direct negative human impacts.

Risk can, however, also be ameliorated in project design. Involving the local community in the project, and providing attractive alternative livelihoods, will reduce human risks, such as poaching, vandalising etc.

Natural risks can be lowered by planting patterns, but if these risks are large then it is good practice to retain credits to act as insurance against losses.

Step 19: Create a tree-planting plan

Although not required as a document for CDM approval, a successful project should also develop a reforestation plan. This plan needs to include the management structure of the planting, the species to be planted, the source of seeds or seedlings to be used in the project (including the possible development of a nursery), site preparation methods, planting methods and a management plan for once the trees are planted.

Standard Operating Procedures (SOPs) should be developed for the each aspect of the planting and include quality assurance and quality control measures to ensure project success.

Step 20: Write Project Design Document

The final step of project development is to write the Project Design Document and submit it for validation. The Project Design Document form is included in *Annex F*. See this Annex for guidance from the A/R Working Group in writing the Project Design Document, with additional recommendations provided by Winrock International.

Step 21: Create contract with Designated Operational Entity

Develop a contract for the validation of your project documents by your chosen Designated Operational Entity.

Step 22: Obtain host country letter of approval from Designated National Authority

Without a letter of approval from the host country's Designated National Authority, the project cannot be registered.

Checklist for Preparation of Project Design Documents

1. **Decide whether to use tCERs or lCERs** – tCERs should be the default choice.
2. **Determine project duration** – 1 x 30 years should be the default choice.
3. **Define project boundary** – following methods outlined in approved methodology.
4. **Apply additionality tool** – select barriers test or financial test. If barriers test selected, decide which barrier.
5. **Apply land eligibility tool** – use satellite imagery, aerial photographs or official documentation to show forest absence on 31 December 1989.
6. **Conduct baseline assessment according to selected approved methodology.** Determine:
   A. baseline strata (decide and delineate); and
   B. baseline carbon stocks (estimate through measurements).
7. **Estimate project sequestration according to selected approved methodology.**
8. **Develop leakage mitigation plan.**
9. **Carry out environmental impacts study.**
10. **Carry out socio-economic impacts study.**
11. **Hold stakeholder consultations.**
12. **Analyse risks.**
13. **Plan to mitigate risks.**
14. **Create tree planting plan.**
15. **Write Project Design Document.**
16. **Agree contract with Designated Operational Entity.**
17. **Obtain host letter of approval from Designated National Authority.**

PROJECT IMPLEMENTATION

Please refer to the *Sourcebook for Land Use, Land-Use Change and Forestry* for guidance on measurement and monitoring of afforestation/reforestation projects and calculation of carbon benefits. The sourcebook is available at http://www.winrock.org/ecosystems/tools.asp.

2.4 Validation, Registration and Certification

The roles of validation and verification are carried out by Designated Operational Entities under the CDM. Protocols, guidelines and checklists have been created that all major Designated Operational Entities use in their procedures to ensure their analyses are completed in a credible, independent, non-discriminatory and transparent manner. The CDM and Joint Implementation Validation and Verification Manual can be found at: www.vvmanual.info.

2.4.1 Validation and Registration

The validation process is split into four distinct phases:

Desk Review

On submission of the Project Design Document and accompanying documentation, the first step is a desk review by the Designated Operational Entity. During the desk review, the Designated Operational Entity will specifically examine: project design, the baseline assessment, sequestration calculations, the monitoring plan, and environmental and socio-economic impacts (including the local stakeholder consultation process). In parallel to the desk review, the Designated Operational Entity posts the Project Design Document on the UNFCCC website and invites comments over a 30-day period.

Prior to moving to the next phase, the Designated Operational Entity presents the project developer with the first list of unresolved issues.

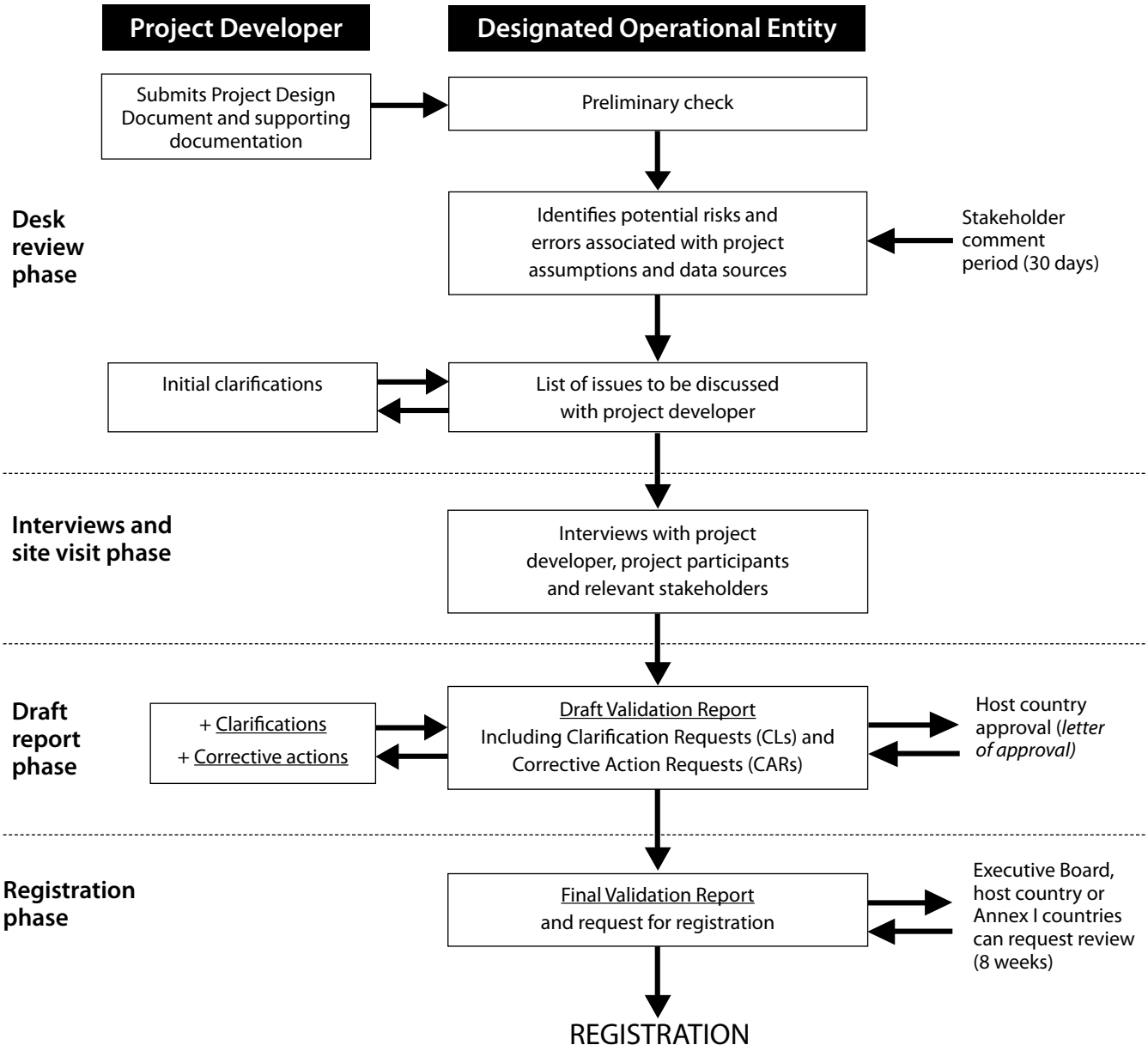
Interviews and Site Visit Phase

In the second phase, the Designated Operational Entity fields a team to visit the project site. During the site visit, the Designated Operational Entity team interviews project operators, the local community and the host country's Designated National Authority to solicit comments and clarifications. At this stage, the project developer can again review the issues and provide clarifications.

Draft Report Phase

With the release of the draft report, the project developer is issued with the official list of Clarification Requests (CLs) and the more serious Corrective Action Requests (CARs). This can be the point of greatest delay in the validation process if there is a Corrective Action Request that requires a great deal of work or time.

At the time of the draft report it is also necessary that the Designated National Authority provide the official Letter of Approval to the Designated Operational Entity. The process cannot move forward without this approval.



Final Report Phase

The final validation report is presented to the project developer and, if the validation has been successful, the Designated Operational Entity submits the project to the CDM Executive Board for registration. The registration is only deemed final if, after a period of eight weeks (four weeks for small-scale projects), there has been no request for review. Requests for review can come from either three members of the CDM Executive Board or any of the Parties involved in the project.

The validation process typically takes an average of 100 days[13]. It is very important to have a delegated project contact point who can respond quickly to requests from the Designated Operational Entity, so that delays in validation do not arise from the project itself. The desk review and site visit phases typically take from six to eight weeks. Serious delays can arise in receiving the letter of approval from the host country's Designated National Authority and from Corrective Action Requests that require significant work and/or time in response.

Commonly encountered errors[14]

Long delays

- Letter of Approval delayed or insufficient;
- Failure to comply with local, regional or national requirements, or missing evidence of compliance;
- Small-scale methodology selected for large-scale projects;
- Non-compliance with applicability conditions.

Short delays

- Lack of logic or consistency in Project Design Document;
- Insufficient information on stakeholder consultation process;
- Lack of justification for deviation from calculation methodology;
- Application of incorrect formulae;
- Project participants not clearly identified;
- Insufficient description of baseline, or lack of supporting evidence for baseline;
- Insufficient explanation of additionality;
- Insufficient proof of land eligibility;
- Major risks to baseline not described;
- Project boundaries not clearly defined;
- Start dates not clearly defined;
- Monitoring procedures not clearly defined;
- Deviations from monitoring methodology not justified.

2.4.2 Verification and Certification

Verification and certification of CERs must be carried out by a different Designated Operational Entity than the one who conducted the validation. After successful verification, the Designated Operational Entity submits a recommendation to the CDM Executive Board for certification and issuance of tCERs or lCERs.

The following list provides an example of some of the facets of the project that may be examined at the time of verification:

- Outstanding issues from validation report;
- Check plantings are as described in Project Design Document;
- Check project boundaries are still in compliance with Project Design Document;
- Check measurement plots and records from plots;
- Examine data uncertainty and quality assurance of measurements'
- Review reporting procedures;
- Personnel capacity – check monitoring personnel have knowledge of methodology;
- Personnel responsibility – check all tasks allocated to sufficiently qualified employees;
- Procedures to record project emissions;
- Leakage – examine leakage calculations and monitoring procedures;
- Data archiving.

PART III: THE GLOBAL CARBON MARKET AND FINANCING OF AFFORESTATION/REFORESTATION CDM PROJECTS

3.1 Overview of the Global Carbon Market

3.1.1 The Pre-Kyoto Protocol Pilot Project Phase

At the First COP in Berlin in 1995, the UNFCCC launched a pilot phase of projects to build experience and "learning by doing". The pilot phase was termed Activities Implemented Jointly (http://unfccc.int/program/coop/aij/aij_np.html). Under the Activities Implemented Jointly, Annex I Parties could implement projects in other countries that reduced emission of greenhouse gases or enhanced removals of sinks.

The number of projects registered under Activities Implemented Jointly has been growing since its launch and as of 2002 (the latest report available) there were 157 projects – 45 percent of which are in developing countries. The total amount of money invested by private sector companies as of 2000 was about $160 million[15]. Because of the expectations that sink projects would be included as a mechanism for achieving targets, several pilot projects were voluntarily implemented involving mostly private sector entities (e.g., electric utility companies, oil companies and environmental non-governmental organisations).

Between the beginning of 1996 and the end of 2003, 76 transactions involving carbon sequestration in the LULUCF sector were signed, representing 40 million t CO_2-e[16]. Relative to all of the carbon transactions that took place over the same period, sink projects accounted for 21 percent of the total number and 23 percent of the total volume. In volume terms, carbon sequestration projects were the single largest project category, and more than three-quarters of this volume was transacted between 1996 and 1999.

The US programme on Activities Implemented Jointly – the US Initiative on Joint Implementation (US IJI) – is the largest pilot programme, with more than 25 registered projects. Slightly more than half of the projects are related to the LULUCF sector and most are in developing countries (as of the 2002 report). Many of these LULUCF project activities are non-Kyoto Protocol eligible and, in many cases, involve a combination of forest conservation and changes in forest management.

An example of a US IJI project is the Noel Kempff Climate Action Project in Bolivia[17]. In 1996, the Government of Bolivia, the Bolivian conservation organisation Fundación Amigos de la Naturaleza (FAN), American Electric Power and The Nature Conservancy designed a forest-based pilot project to allow for the expansion of Noel Kempff Mercado National Park by adding about 635,000 hectares of land. PacifiCorp and BP Amoco joined the project in 1997. About US$9.5 million has been invested in this project that will generate about 15 million t CO_2-e over 30 years.

The advantages of implementing projects under the Activities Implemented Jointly programme is that usually the funds are provided upfront based upon the total amount of carbon credits that potentially will be generated. To obtain the funds upfront, however, a study has to be made demonstrating the feasibility of the project and the likely amount of carbon credits. For example, the US IJI has a detailed description of what needs to go into a proposal on its website (http://www.gcrio.org/usiji/default.html). Private US investors generally require such approval from the US IJI to implement a project. There are several disadvantages of the upfront financing, including: the low carbon "price" (amount invested divided by the estimated carbon credits – most are $0.3-$1.4/t CO_2-e or less, although some are as high as $7.6/t CO_2-e[18]) for the life of project (up to 40 years); uncertainty with respect to companies willing to invest; high transactions costs and low incentives for ensuring permanence, given payments are upfront.

Between 2000 and 2003, the share of sinks projects by total volume transacted sharply declined, in parallel with the US government's withdrawal from the Kyoto Protocol and the limitation of LULUCF to afforestation/reforestation. Although the share declined, 19 sink purchases were concluded in 2002 and another 20 in 2003. One firm, Future Forest, accounted for more than half of the purchases during this two-year period. Future Forests' purchases were all for less than 10,000 t CO_2-e and geared towards small individual and corporate clients. Large-scale transactions were considerably less common.

3.1.2 The Kyoto Protocol and the Flexible Mechanisms

The Activities Implemented Jointly programme has now almost completely been replaced by the processes associated with the Kyoto Protocol. In anticipation of Protocol payments, many Joint Implementation and CDM projects were developed before the governing rules had even been determined. These projects benefited through having a long period in which to avoid emissions or to sequester carbon but faced the cost of being the experimental "guinea pigs" for the process.

In recent years leading up to Kyoto Protocol ratification, the market for emission reduction credits has been growing rapidly. As an example of the growth, a 38 percent greater volume was exchanged in 2004 than in 2003[19]. As Kyoto ratification occurred in February 2005, an even greater growth might be expected after this date.

As an indication of this potential growth, capitalisation of carbon funds grew by 250 percent between January 2004 and April 2005. Point Carbon estimates traded volumes of 94 million t CO_2-e in 2004 and 799 million t CO_2-e in 2005, which is an 850 percent increase[20]. Sixty percent of the traded volumes were purchased from Europe, two-thirds of which were by private firms and one-third by governments. The Government of The Netherlands alone was responsible for 16 percent of purchased volumes. The demand from private firms seems to be steady while the demand from governments is increasing rapidly.

The project type with the largest proportion of traded volumes has been HFC23 destruction (25 percent of total; all in Asia), followed by capturing nitrous oxide and methane from animal waste (18 percent), and hydroelectric, biomass energy, and landfill projects (each with 11 percent). LULUCF to date has represented zero percent of the traded volumes under the Protocol because, as of March 2006, no LULUCF projects had been fully registered.

The market has not been growing as fast as might be expected for two principal reasons. Firstly, the supply response to increased demand is slow as the time necessary for projects to establish and begin to gain credits is slow under the Kyoto Protocol process[21]. Secondly, as governments appear to be the major buyers of the future there is some delay – governments need more time to budget for and purchase than would be the case for the private sector.

Outside Europe, demand for project-derived credits is growing with strong indications from both Canada and Japan that substantial amounts of CERs will be required.

The European Union Emissions Trading Scheme

With the dominance of European buyers, the European Union Emissions Trading Scheme (EU ETS) has become the dominant player in Kyoto Protocol emissions trading. The EU ETS trades EU allowances (EUAs), which are equivalent to assigned amount units (AAUs).

A "linking directive" governs the relationship between the ETS and the Kyoto Protocol. The directive allows Joint Implementation and CDM emission reduction credits to be used (under certain circumstances) against targets under the ETS. Significantly, however, LULUCF projects are currently *excluded* under the ETS[22].

3.1.3 *Non-Kyoto Protocol Markets*

A proportion of the volume traded every year is outside the Kyoto Protocol system, principally in the voluntary market in the US and in the mandatory market in New South Wales, Australia.

In the US, trading of voluntary emissions reduction units can occur on the Chicago Climate Exchange (CCX). LULUCF projects, including forest management and forest conservation, are eligible for this market. As would be expected, project requirements are less than under the Kyoto Protocol flexible mechanisms and this market is likely to see expansion. For example, one Californian electricity company (PG&E) will start offering a scheme whereby customers can volunteer to pay a small premium on their monthly utility bill, which will be used to fund "independent environmental projects aimed at removing CO_2 from the air"[23].

In Australia, the New South Wales Greenhouse Gas Abatement Scheme has placed mandatory benchmarks on NSW electricity retailers and other parties.

3.2 Markets for Afforestation/Reforestation CDM Activities

3.2.1 *Background*

Afforestation/reforestation projects are uniquely beneficial as they can be implemented almost anywhere, including Least Developed Countries. CDM activities are currently negligible in Africa, particularly if South Africa and northern Africa are excluded. Trees, however, can be planted in the poorest regions and benefit the poorest communities. Terrestrial carbon sequestration was a key topic in the many discussions and negotiations leading up to the Kyoto Protocol, because it had been shown that sinks projects could play an important role at relatively low cost, especially in non-Annex I countries[24]. Consequently, as already discussed, LULUCF projects formed a significant proportion of the Activities Implemented

Jointly portfolio. Many anticipated LULUCF would be just as important under the CDM. At COP-7, it was determined that LULUCF under the CDM should be limited to just afforestation and reforestation[25]. Early start projects began mobilising at this point; in particular with the creation of the A/R Working Group in June 2004. Following the acceptance of the first afforestation/reforestation approved methodologies in November 2005, it is anticipated that afforestation/reforestation projects will proliferate.

Fears of permanence and leakage with afforestation/reforestation LULUCF projects have led to its current exclusion from potentially the biggest CDM market – the EU ETS. It is hoped this decision will be overturned when the positive and secure impacts that LULUCF can make are demonstrated[26]. The scale with which CDM-LULUCF can be used to meet commitments under the Kyoto Protocol is presently limited to 1 percent of the total assigned amount per year of the first commitment period. An additional hindrance to afforestation/reforestation projects is that they can only attain temporary credits that must eventually be replaced with permanent energy credits. Thus, afforestation/reforestation can only be a temporary solution for any buyer, which in turn leads to lower prices.

3.2.2 Current Status of the Market for LULUCF Credits

As of the beginning of April 2006, no afforestation/reforestation projects have been registered and so no lCERs or tCERs have been made available for trading. However, as noted under the Activities Implemented Jointly, LULUCF accounted for 21 percent of trades and 23 percent of traded volume. Outside of the UNFCCC, LULUCF credits have been traded in the New South Wales Greenhouse Gas Abatement Scheme and in the Chicago Climate Exchange.

The futures market is dominated by the Kyoto Protocol. The only notable buyer at the moment is World Bank through its dedicated carbon funds (see *Section 3.3.4*). Nevertheless, there will remain a need for CDM credits for Annex I Parties to meet their commitments. It appears likely that afforestation/reforestation credits will form a significant supply up to the cap of 1 percent of assigned amounts[27].

3.3 Financing Afforestation/Reforestation CDM Projects

3.3.1 Costs to CDM Projects

Cost	Estimated financial requirement
Project development and establishment	US$25,000–75,000
Designated Operational Entity validation	US$10,000–15,000
CDM registration	US$0.10/CER for the first 15,000 t CO_2-e/year, US$0.20/CER for any additional credit up to an annual maximum of US$350,000
Adaptation fund	2% of CERs issued under project levied for fund to help vulnerable countries adapt to climate change (not for small-scale AR projects)
Host country tax	Some countries will tax CERs using either a standard sales tax or at a CDM-specific rate

3.3.2 The Objectives of Buyers

The dominant motivation of buyers of CDM credits is to meet their emissions reduction commitments. Currently, it seems that most Annex I countries will have to stretch to reach their emissions reduction goals, consequently pressure is on the demand-side rather than the supply-side. If supply were to exceed demand, then companies, entities and governments could select between International Emissions Trading (governments only), Joint Implementation and the CDM. In this case, CDM is favoured in terms of the auxiliary development benefits and, potentially, cost, but is hindered by at least a perception of enhanced risk of activities in non-Annex I countries.

For buyers of credits outside the Kyoto Protocol, the objectives may be to meet non-Kyoto Protocol mandatory emissions reductions, such as in New South Wales or in the northeast US (under the Regional Greenhouse Gas Initiative[28]). Alternatively, under voluntary markets, the motivation may be preparedness for a future mandatory programme, or public relations for customers, investors and share holders.

3.3.3 Form of Payment

To date, most projects have followed the commodity model whereby buyers purchase CERs and all risk is carried by the project developer. Very few projects have followed the investment model where payments are upfront. Upfront payments have

great advantages for projects, in that project development costs can be covered. However, they are likely to lead to significantly lower prices for CERs as the buyer is then paying for a commodity to be received in the future and is also sharing project risk.

3.3.4 Current Buyers

The BioCarbon Fund

The multilateral funds for carbon projects are overwhelmingly dominated by the World Bank, which facilitates eight carbon funds: the Prototype Carbon Fund (www.prototypecarbonfund.org), the Italian Carbon Fund (ICF; www.carbonfinance.org), the Netherlands Clean Development Facility (www.carbonfinance.org), the Community Development Carbon Fund (CDCF; www.communitycarbonfund.org), the BioCarbon Fund (BioCF; www.biocarbonfund.org), the Netherlands European Carbon Facility (NECF; www.carbonfinance.org), the Spanish Carbon Fund (SCF; www.carbonfinance.org) and the Danish Carbon Fund (DCF; www.carbonfinance.org). The NECF focuses on developing Joint Implementation projects, including possible sinks projects, in Eastern Europe. The SCF will focus on renewable energy and energy efficiency projects. The DCF will not include sinks projects.

All these funds are generally based on the same model. Industrialised countries and companies provide investments (money) that are aggregated in one "pot". These funds, along with other project funding, provide cash flow to host countries and communities to develop carbon projects and produce carbon credits, as well as pre-financing for project identification and preparation activities such as capacity building, outreach and research, leading to the creation of supportive project approval systems in host countries. Funds provided during the project development stage are, for the most part, serving as a loan and are repaid when the project is implemented and carbon credits accrue. The amount of financing will be proportional to the amount of carbon credits the projects will produce, and payment will be made each year as the carbon credits are produced (about \$3-\$6/t CO_2-e). The carbon credits, in return, will go into one "pot", thus generating a mixed portfolio. They are then provided to countries and companies, based upon the amount they invested.

The World Bank carbon-financing instruments were created to generate a portfolio of projects that provide benefits to both the host countries and projects as well as to the companies or countries that invest in them. Characteristics of the projects that benefit the host countries include: private capital flows for projects aimed at reducing poverty, investment in cleaner technologies and best practices, ongoing partnerships, and capacity building for communities and intermediaries. For the companies and governments that invest, the benefits include: acquisition of emission reduction credits for compliance, trading, and insurance; cheaper transaction costs; risk mitigation via diversification; knowledge of carbon asset creation; demonstrated social responsibility; and access to additional credits in each deal.

From a practical perspective, there are both advantages and disadvantages to having a project under the World Bank's carbon funds. The advantages include a guaranteed buyer for up to 15 or more years of the project duration at the fixed price initially negotiated; if prices decrease, the developer still receives contract price; and the funds take on much of the risk, address the issue of replacement or retirement of CERs before they expire, and provide technical capacity for designing and verifying the projects. There are very few disadvantages for a project developer to participate in the World Bank funds. A key one may be that if CER prices rise in the future because demand exceeds supply, a project in the World Bank's portfolio is subject to the initially negotiated lower price for the project duration. In addition, all projects entering World Bank-managed carbon funds must satisfy the World Bank operational policies and procedures, including environmental and social safeguard policies[29].

Buyers outside the BioCarbon Fund

An alternative option is for project developers is to obtain financing independently for Kyoto-compliant project development and implementation by developing a business plan like any other venture to raise capital. The CDM Executive Board recently decided (February 2005) that non-Annex I countries can develop projects without Annex I partners.

The CDM Facility of the Asian Development Bank can contribute to this process (www.adb.org/CDMF/default.asp). This CDM facility was established in August 2003 to assist its developing member countries to access development opportunities made possible through the CDM. Its stated goals are to promote projects that contribute to poverty reduction, sustainable development and mitigation of greenhouse gases; lower CDM transaction costs; assist in finding competitive prices for carbon credits arising from projects; and facilitate

access to finance by improving project viability. To accomplish these goals, the CDM Facility assists its members to identify CDM opportunities; develop CDM documentation (such as Project Design Documents and new methodologies); move the project through the CDM cycle until it is successfully registered with the CDM Executive Board; and build local capacity.

Some funding is available from the CDM Facility to cover upfront transaction costs that the facility only recovers if the project obtains a purchase agreement. These transaction costs include costs for CDM due diligence and regulatory and documentation requirements until the project has been registered and validated. For the first few selected projects, transaction costs will be capped at US$ 100,000.

The advantage of obtaining financing independently is that the project developers can sell tCERs or lCERs at a price the market will bear, but at present the market is uncertain. Disadvantages include: the need for a significant amount of funding upfront to develop and market the "business plan"; the market could be uncertain and risky; and the need for a high degree of capacity to manage, implement and monitor the project. Given the uncertain market, this approach may be more suited to the future when commitments will need to be higher and the market will be more mature and somewhat more predictable.

Options for non-BioCarbon Fund buyers are Annex I governments and individual corporate entities. Unfortunately, the current exclusion of LULUCF from the EU ETS limits the involvement of companies and corporations as afforestation/reforestation CDM buyers. Consequently, it is likely that governments will be the dominant buyers of credits.

Non-Kyoto Protocol Purchases

As noted earlier, a proportion of the volume of credits traded every year is outside the Kyoto Protocol system, principally in the voluntary US market and the mandatory market in New South Wales. In the US, the voluntary nature of the market leads to low prices for traded units, typically between $1-$2 t CO_2-e. This market is likely to see expansion. In Australia, the New South Wales Greenhouse Gas Abatement Scheme has placed mandatory benchmarks on NSW electricity retailers and other parties. Under this mandatory scheme, prices have averaged US$8.1 t CO_2-e.

3.3.5 Sources of Funding for Project Development

Sources of funding for project development include:

- Grants and subsidies[30];
- Upfront payments for credits[31];
- Soft loans and loan guarantees;
- Commercial lending;
- Equity investment into companies; and
- Investment into other income-generating activities.

3.4 Risks and Uncertainties

3.4.1 Risks to Project Developer

As the project is typically paid on delivery of the temporary CERs, the dominant portion of the risk rests with the project developer (the seller). Risks to the seller refer to any event(s) that negatively effect the expected greenhouse gas (and consequently financial) benefits to the project. These risks include:

- *Natural risks:* fire, disease, lower than predicted growth rates, drought, floods, damaging winds;
- *Anthropogenic factors*: encroachment, poaching, fire, vandalism;
- *Political risks*: policy changes, unstable governments;
- *Economic risks:* exchange rates, interest rates, lower than expected tCER/lCER prices, changes in opportunity cost of land.

Risks are particularly acute where lCERs have been selected as the form of credit – lCERs have an initial duration equal to the length of the crediting period but expire immediately if the stored carbon has diminished at the next verification.

3.4.2 Risks to CER Purchaser

As stated above, under the CDM system risk is concentrated with the seller. However, this is not the case where there has been an upfront payment for CERs or where a particular supply of credits is relied upon by the buyer to fulfil an assigned amount commitment.

3.4.3 Risk Mitigation Mechanisms

Buyers can mitigate their risk by only paying upfront for projects in which they have high confidence of successful delivery. Confidence should be attained through examining the risk mitigation activities and policies of the seller. As the greatest risk lies with the seller, the seller retains the greatest opportunity and responsibility for risk mitigation. Beyond deciding optimal project location and planting design (as discussed in *Section 2.2*), policies can be implemented to further mitigate risks to the project, examples include:

- "Good practice management systems" to control the occurrence of, and the response to, damaging events;
- "Self-insurance reserves", where a portion of tCERs or lCERs is kept as reserves against a future shortfall. If damage does not occur, then the reserve can be sold at the end of the crediting period.
- Involvement of stakeholders. Retaining the involvement of stakeholders beyond the initial project design period retains good will and reduces risks of poaching or malicious damage.Stakeholders can be further incentivised through the transfer of technologies and the implementation of activities that will directly benefit the community.

END NOTES

[1] *http://unfccc.int/essential_background/convention/background/items/1349.php*

[2] Referred to as the Marrakesh Accords; FCCC/CP/2001/13/Add.2; 17/CP.7. Modalities and procedures for a clean development mechanism, as defined in Article 12 of the Kyoto Protocol.

[3] cf. the Marakesh Accords: *http://unfccc.int/resource/docs/cop7/13a02.pdf#page=2*

[4] Draft Decision -/CMP.1 2003, Annex, Section A. Definitions paragraph 1(g and h).

[5] The CERs would be added to the assigned amount of the Annex I country, creating an elevated total permitted level of emissions.

[6] Projects have the option of creating an amendment to the methodology. However, such an amendment would have to go through the methodology approval process with the required costs, both in terms of time and finances.

[7] *http://cdm.unfccc.int/Panels/ar/ARWG07_repan07_National_policies.pdf*

[8] Contact the Designated National Authority to verify the national definitions of forest.

[9] It is unlikely that any project will not choose to apply the afforestation/reforestation Additionality Tool.

[10] Barriers can be around investment, technology or prevailing practices.

[11] The imagery is unambiguous if an entire area is deforested at a given time period. Where a mosaic of forest with regeneration, shrubs and multiple-use (agroforest) trees exists, interpretation is more complex.

[12] If the current land use is entirely different from the land use at the time of the imagery, then there can be no correlation between present-day ground truthing and the historic imagery.

[13] Information on timing for the validation process derived from: "CDM PDD Guidebook: Navigating the Pitfalls." Sami Kamel (ed.). UNEP Risø Centre. November 2005.

[14] ibid.

[15] Brown, S., Masera, O. and Sathaye J. 2000. *"Project-based activities."* In Watson, R.T., I. R. Noble, B. Bolin, N. H. Ravindranath, D. J. Verardo and D. J. Dokken (eds.), Land Use, Land-Use Change and Forestry; Special Report to the Intergovernmental Panel on Climate Change, Cambridge University Press (UK), Ch. 5: 283-338.

[16] Bosquet, B. 2005. *"Specific Features of Land Use, Land-Use Change and Forestry Transactions."* In Streck, C. and D. Freestone (eds.), Legal Aspects of Implementing the Kyoto Protocol Mechanisms: Making Kyoto Work. Oxford University Press, pp. 281-294.

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[17] Brown, S., M. Burnham, M. Delaney, R. Vaca, M. Powell and A. Moreno. 2000. "Issues and challenges for forest-based carbon-offset projects: a case study of the Noel Kempff Climate Action Project in Bolivia." *Mitigation and Adaptation Strategies for Climate Change* 5:99-121.

Winrock International, 2002. "2001 Analysis of Leakage, Baselines, and Carbon Benefits for the Noel Kempff Climate Action Project." Report to the Nature Conservancy, Arlington, Virginia, USA. *http://conserveonline.org/2003/01/k/Noel_Kempff_report;internal&action=buildframes.action*

Sohngen, B. and S. Brown. 2004. "Measuring leakage from carbon projects in open economies: a stop timber harvesting project in Bolivia as a case study." *Can. J. For. Res.* 34: 829-839.

http://nature.org/initiatives/climatechange/work/art4253.html

[18] Brown, S., Masera, O. and Sathaye J. 2000. *"Project-based activities."* In Watson, R.T., I. R. Noble, B. Bolin, N. H. Ravindranath, D. J. Verardo, and D. J. Dokken (eds.), Land Use, Land-Use Change and Forestry: Special Report to the Intergovernmental Panel on Climate Change, Cambridge University Press (UK), Ch. 5: 283-338.

[19] Lecocq, F. and Capoor, K. 2005. State and Trends of the Carbon Market, 2005. Development Economics Research Group, World Bank, Washington DC, USA. *http://carbonfinance.org/docs/CarbonMakretStudy2005.pdf*

[20] Point Carbon. 2006. Carbon 2006. Hasselknippe, H. and K. Røine (eds). pp. 60.

[21] Brown, S., I. Noble and B. Bosquet. 2006. Financing options for carbon sequestration projects under the clean development mechanism. Unpublished paper, available at *www.winrock.org*

[22] This will be revisited in 2008.

[23] *http://www.pge.com/news/news_releases/q1_2006/060125.html*

[24] Brown, S., Masera, O. and Sathaye J. 2000. *"Project-based activities."* In Watson, R.T., I. R. Noble, B. Bolin, N. H. Ravindranath, D. J. Verardo, and D. J. Dokken (eds.), Land Use, Land-Use Change and Forestry: Special Report to the Intergovernmental Panel on Climate Change, Cambridge University Press (UK), Ch. 5: 283-338.

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[25] *http://unfccc.int/cop7/accords_draft.pdf*

[26] In 2008, when this decision will be revisited.

[27] At COP-7, it was decided that CDM credits derived from LULUCF projects could not represent more than 1% of the assigned amount of any country.

[28] *http://www.rggi.org/about.htm*: The Governors of seven Northeastern US States have agreed to stabilise emissions from power plants between 2009 and 2015, followed by a 10% reduction by 2019.

[29] Noble, I, 2005. BioCarbon Fund Frequently Asked Questions. World Bank, Washington, DC. *http://carbonfinance.org/biocarbon/router.cfm?Page=FAQ#7*

[30] An example of an applicable grant is the PHRD Fund (Policy and Human Resource Development Fund) administered by the World Bank, which can provide grants for CDM project development. The fund represents a collaboration between the Japanese Government and the World Bank, which acts as the administrator and Trustee of the Fund.

[31] For example, LULUCF projects have received upfront payments from the Government of Canada (project ARNM0012) and the Government of Italy (project ARNM0020).

ANNEXES

A GLOSSARY OF TERMS

Accuracy: How close a measure is to its true value.

Activity shifting: A form of *leakage* where activities that cause emissions are not permanently avoided, but simply displaced. For example, if one area is set aside for reforestation, cattle farmers who were farming the area might deforest an alternative area outside project boundaries to replace their lost grazing land.

Additionality: Additionality demonstrates that CDM financing has led to an increase in sequestration or a decrease in emissions.

Additionality tool: A tool developed by the CDM Executive Board (and adapted by the A/R Working Group for afforestation/reforestation projects) for the purpose of demonstrating additionality.

AR or A/R: Afforestation and reforestation

Baseline: The emissions or removals of greenhouse gases that would occur without the project.

Biomass: Organic material (above- or belowground, live or dead).

Boreal: Mean annual temperature of less than 0°C.

Carbon pool: Organic material containing carbon.

Carbon stock: Quantity of carbon in a given pool(s) per unit area.

CER: Certified Emission Reduction – the CDM trading credit. CERs are temporary for A/R projects and classified as tCERs (temporary) or lCERs (long-term). tCERs are valid for five years before expiring; lCERs are valid until end of current crediting period.

CDM: Clean Development Mechanism.

Confidence interval: A measure of the spread of data. The confidence interval gives a range of values in which there is a percentage probability (usually 95%) of the true mean occurring. Calculated by multiplying the standard error by the appropriate t-value.

CoP: Conference of the Parties to the UNFCCC.

CoP/MoP: Conference of the Parties to the UNFCCC serving as the Meeting of the Parties to the Kyoto Protocol.

Cropland: Defines any land on which non-timber crops are grown. This includes both herbaceous crops and higher carbon-content systems such as vineyards and orchards.

DNA: Designated National Authority. The UNFCCC National Focal Point takes this role.

DOE: Designated Operational Entity. The independent, approved verifying organisations of the Kyoto Protocol. Until fully accredited, known as Applicant Entities (AE).

EB: Executive Board. The governing body of the CDM.

Eligibility (land): To be eligible for an AR CDM project, land must have been deforested before 31 December 1989 and continuously without forest since that date. The Designated National Authority defines the forest.

Forests: All land with a canopy cover of greater than 10-30% (dependent upon national definition of forest). Can include natural forest, plantation, forested wetland and mangrove.

Grazing land: A very broad category that includes managed pastures, prairies, steppe and savannas. Grazing lands will often include trees, but only when the canopy cover is less than 10-30%[20]. Aquatic systems such as flooded grasslands and salt marshes are also included in this category.

Greenhouse gases: Gases in the atmosphere (both natural and anthropogenic) that absorb and emit radiation. This property of the gases causes the greenhouse effect. The primary gases in the earth's atmosphere are water vapour, carbon dioxide, nitrous oxide, methane and ozone

Hardwoods: Hardwoods are the botanical group of trees that have broad leaves and produce a fruit or nut.

Leakage: The loss of carbon outside the boundaries of the project as a result of project activities.

lCER: Long-term CER. See *CER*.

Market effects: A form of *leakage* that occurs when emission reductions are countered by emissions created by shifts in supply and demand of the products and services affected by the project. This is of minimal importance for farming activities, but can be important for large-scale commercial timber harvesting. For example, a stop-logging project might decrease the supply of timber leading other practitioners to increase their rate of harvest. Market effects leakage is unlikely to be a problem for A/R projects.

Mean: Sum of observations divided by number of observations.

NM: New CDM methodology.

Permanence: A measure of the anticipated longevity of carbon sequestered as part of a CDM activity.

PIN: A project idea note. This is a document prepared early in project planning that defines the type of project, the anticipated location, cost and potential sequestration.

Precision: The repeatability of a measure, or the range of values between which the true value may lie.

Sequestration: The process of increasing the carbon stock in an ecosystem.

Softwood: Softwoods or conifers (from the latin word meaning cone-bearing) are the group of trees with needles.

Temperate: Mean annual temperature between 0-20°C.

tCER: Temporary CER. See *CER*.

Tropical: Mean annual temperature greater than 20°C.

UNFCCC: United Nations Framework Convention on Climate Change.

Validation: The process by which a DOE approves and then requests registration of a Project Design Document and project.

Verification: The process by which claimed emission reductions or sequestration is approved and CERs are subsequently issued.

Without-project scenario: See *baseline*.

B TABLE OF MONITORING/BASELINE AND MONITORING METHODOLOGIES

This table contains both approved methodologies and those methodologies under consideration by the A/R Working Group.

Methodology	Full name	Approved?‡	Small-scale?	Leakage?†	Pools*
AR-AM0001	Reforestation of degraded lands	Yes	No	No	AG / BG
AR-AM0002	Restoration of degraded lands through afforestation/reforestation	Yes	No	No	All
AR-AM0003	Afforestation and reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing	Yes	No	Yes	AG / BG
AR-NM0012	Afforestation or reforestation project activity implemented on unmanaged grassland – Brazil	No *(rated B)*	No	No	AG / BG
AR-NM0013	The mountain pine ridge reforestation project – Belize	No *(rated B)*	No	Yes	All
AR-NM0015	Reforestation as renewable source of wood supplies for industrial use in Brazil	No *(WIP)*	No	Yes	AG / BG
AR-NM0017	Mexico seawater forestry project	No	No *(rated B)*	No	All
AR-NM0019	Reforestation around Pico Bonito National Park, Honduras	No *(WIP)*	No	Yes	AG / BG
AR-NM0020	Afforestation for combating desertification in Aohan County, Northern China	No *(WIP)*	No	No	AG / BG / SOC
AR-NM0021	Chocó-Manabí corridor reforestation and conservation carbon project – Ecuador	No *(prelim. rec.)*	No	Yes	AG / BG / DW / FF
AR-NM0024	San Nicolás CDM-Colombia reforestation project	No	No *(prelim. rec.)*	No	AG / BG / DW / FF
Small-Scale	Simplified baseline and monitoring methodology	Yes	Yes	Yes	AG / BG

‡ All projects are rated by the A/R Working Group and the CDM Executive Board. A rating of A means methodology approval, B invites resubmission in response to specific comments and C indicates a rejection of the methodology. A favourable methodology may be given a "preliminary recommendation" (prelim. rec.), which means that the decision between A and B is delayed while technical clarifications are sought. WIP means work in progress and indicates that the A/R Working Group is itself addressing minor issues prior to approval.
† All projects include leakage through vehicle use outside project boundaries. A "yes" in the leakage column indicates consideration of leakage through activity shifting and/or market effects.
* AG = aboveground trees, BG = belowground trees, DW = dead wood, FF = forest floor (litter), SOC = soil organic carbon.

C LINKS TO TOOLS

The following tools:

- An Excel calculator for determining required number of plots and an indication of costs using plot calculating methods from AR-AM0001 (versions in English and Chinese).
- A checklist for afforestation and reforestation CDM projects contained in the *Sourcebook for Land Use Land Use Change and Forestry*; and
- Monitoring methods guidelines in French and in Chinese can be found at: http://www.winrock.org/ecosystems/tools.asp

Additional tools can also found at: http://www.joanneum.at/encofor/tools/tools.html (Under development)

The IPCC *Land Use, Land-use Change and Forestry Good Practice Guidance* can be found at: http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm

D LIST OF RELATED RESOURCES AND ORGANISATIONS

CATIE (Tropical Agricultural Research and Higher Education Center, Costa Rica): http://www.catie.ac.cr/english/

CDM Executive Board: http://cdm.unfccc.int/EB

CDM A/R Working Group: http://cdm.unfccc.int/Panels/ar

Center for International Forest Research (CIFOR): http://www.cifor.cgiar.org

Conservation International Center for Environmental Leadership in Business: http://www.celb.org

Encofor (an EU-funded project for the design of sustainable CDM forestry projects): http://www.joanneum.at/Encofor/

European Commission Joint Research Centre: http://ies.jrc.cec.eu.int/fp6ccu.html

Food and Agriculture Organization (FAO): http://www.fao.org

International Tropical Timber Organization (ITTO): http://www.itto.or.jp

Joanneum Research: http://www.joanneum.at/

The Nature Conservancy: http://www.nature.org/initiatives/climatechange/

United Nations Framework Convention on Climate Change (UNFCCC): http://unfccc.int

Winrock International: http://www.winrock.org/ecosystems/

World Agroforestry Centre (ICRAF): http://www.worldagroforestry.org/

World Bank BioCarbon Fund: http://www.biocarbonfund.org

E ELIGIBILITY AND ADDITIONALITY TOOLS

The Land Eligibility Tool

The CDM Executive Board developed a mandatory tool to be used to define the eligibility of lands for afforestation/reforestation project activities.

1. **Project participants shall provide evidence that the land within the planned project boundary is eligible as an afforestation/reforestation CDM project activity following the steps outlined below.**

(a) Demonstrate that at the moment the project starts, the land is not a forest by providing information that:

   i. The land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decisions 11/CP.7 and 19/CP.9, as communicated by the respective Designated National Authority; and

   ii. The land is not temporarily unstocked as a result of human intervention such as harvesting or natural causes, or is not covered by young natural stands or plantations which have yet to reach a crown density or tree height in accordance with national thresholds and which have the potential to revert to forest without human intervention.

(b) Demonstrate that the activity is an afforestation/reforestation project activity:

   i. For reforestation project activities, demonstrate that on 31 December 1989, the land was below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority.

   ii. For afforestation project activities, demonstrate that the land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority, for a period of at least 50 years.

2. In order to demonstrate steps 1(a) and 1(b), project participants shall provide one of the following forms of verifiable information:

(a) Aerial photographs or satellite imagery complemented by ground reference data; or

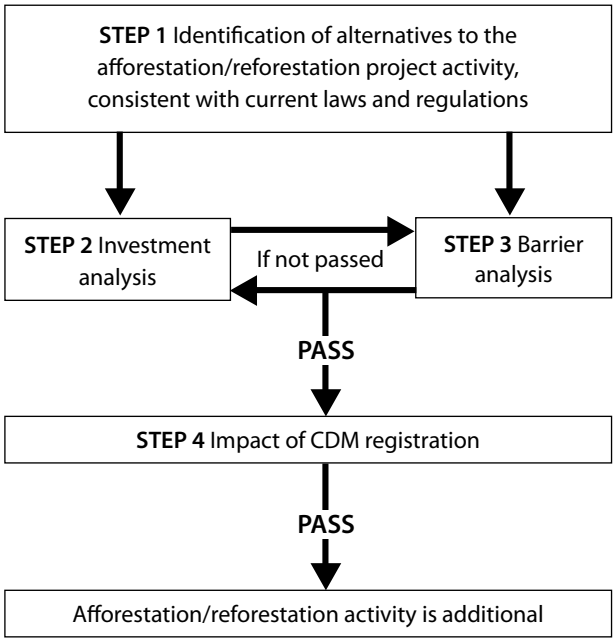
(b) Ground-based surveys (land-use permits, land-use plans or information from local registers such as cadastre, owners' register, land-use or land-management register); or

(c) If options (a) and (b) are not available/applicable, project participants shall submit a written testimony which was produced by following a participatory rural appraisal methodology.

Participatory rural appraisal is an approach to the analysis of local problems and the formulation of tentative solutions with local stakeholders. It makes use of a wide range of visualisation methods for group-based analysis to deal with spatial and temporal aspects of social and environmental problems.

From CDM Executive Board's 22nd meeting, Annex 16

The Additionality Tool



Step 1: Identification of alternatives to afforestation/reforestation project activity, consistent with current laws and regulations

Realistic and credible alternative land uses must be identified, including continuation of the current situation. The applicable legal and regulatory requirements must be discussed for all alternatives. If the proposed project activity is the only alternative that is legally required, and the requirements are enforced, then the project is not additional.

The project developer may choose Step 2 or 3, or both.

Step 2: Investment analysis

Is the proposed project activity economically or financially less attractive than the other alternatives (identified in Step 1) without the revenue from the sale of carbon credits?

Step 3: Barrier analysis

Does the proposed project activity face barriers to prevent implementation? Does this barrier fail to prevent the implementation of at least one of the alternatives (identified in Step 1)?

These barriers may include:

Investment barriers, e.g. no source of funding to overcome initial costs of establishing the activity;

Technological barriers, e.g. lack of properly skilled or trained labour, lack of infrastructure to implement project;

Prevailing practice barriers, e.g. the project activity is a new practice in the country or region.

Step 4: Impact of CDM registration

An explanation is required of how the benefits and incentives of CDM registration will alleviate the economic and financial hurdles (Step 2) and/or other barriers (Step 3), enabling the project activity to be undertaken.

F THE PROJECT DESIGN DOCUMENT

Comments in grey boxes are the advice of the A/R Working Group

Comments in green text are the advice of this guidebook.

CLEAN DEVELOPMENT MECHANISM PROJECT DESIGN DOCUMENT FORM FOR AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES (CDM A/R PDD)

Version 2, in effect as of March 2006

CONTENTS

SECTION A: General description of the proposed A/R CDM project activity

A.1. Title of the proposed A/R CDM project activity

>>

Please indicate the:
- Title of the A/R CDM project activity;
- Version number of the document;
- Date of the document.

The version number should be updated for each revision of the Project Design Document (PDD). Several versions of the PDD will be submitted to the Designated Operational Entity during validation and the numbering is important for tracking purposes.

A.2. Description of the proposed A/R CDM project activity

>>

Please include in the description:

- The purpose of the proposed A/R CDM project activity;
- The view of the project participants on the contribution of the A/R CDM project activity to sustainable development (maximum one page).

Please use the list of key words available on the UNFCCC CDM website. If no suitable key words can be identified, or if it is considered that they are insufficient, please suggest a new key word(s), being guided by relevant information on the website.

This section should not exceed one page. Information included should only relate to the project, nothing should be included about any other activities conducted by the project participants nor specific information on any of the participants. Host country information should be limited to information directly related to the project site.

A.3. Project participants

>>

Please list project participants and party(ies) involved and provide contact information in Annex 1. Information should be indicated using the following tabular format:

Name of Party involved* ("Host" indicates a host Party)	Private and/or public entity(ies) project participants* (as applicable)	Kindly indicate if Party involved wishes to be considered as project participant (Yes/No)
Name A (host)	• Private entity A • Public entity A …	No
Name B	• None	Yes
Name C	• None	No
…	• …	…*

- In accordance with the CDM A/R modalities and procedures, at the time of making the CDM A/R PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

The table above should be completed in full. The "Name of the Party" column should only include the names of countries with a role in the project (e.g., host, financier etc.). Any companies or other entities involved in the project are then listed in the second column within the row of the country they are located in.

Only entities that are integral to the project should be listed (i.e., those making decisions about allocation of tCERs or lCERs). Consultants that are only involved in the development of the PDD should not be listed as project participants.

In the final column, only put YES if the country has explicitly stated that it wants to be considered as a project participant. The default here is NO. Most countries do not want to be project participants.

A.4. Technical description of the A/R CDM project activity

A.4.1. Location of the proposed A/R CDM project activity

>>

Detail in this section should be determined by potential for confusion. If other CDM activities exist in the area, or are being planned in the area, more detail should be provided.

All planting sites should be listed.

A.4.1.1. Host Party(ies)

>>

A.4.1.2. Region/State/Province etc.

>>

A.4.1.3. City/Town/Community etc.

>>

A.4.1.4. Detail of geographical location and project boundary, including information allowing the unique identification(s) of the proposed A/R CDM project activity

>>

The "project boundary" geographically delineates the A/R CDM project activity under the control of the project participants. The A/R CDM project activity may contain more than one discrete area of land. If an A/R CDM project activity contains more than one discrete area of land, then:

- Each discrete area of land should have an unique geographical identification; and
- The boundary should be defined for each discrete area and should not include areas in between the discrete areas of land.

The project boundary should be delineated using a GPS (global positioning system). Details of this delineation should be shown to the Designated Operational Entity at validation.

A.4.1.5. A description of present environmental conditions of the area, including climate, hydrology, soils, ecosystems, and the possible presence of rare or endangered species and their habitats

>>

Do not make this section too long (2-3 pages maximum). The purpose is to inform about the project area, in particular with regard to potential risks and impacts of the project activity.

A.4.2. Species and varieties selected

>>

A.4.3. Specification of the greenhouse gases (GHG) whose emissions will be part of the proposed A/R CDM project activity

>>

Please specify the GHG that are expected to be emitted as a result of implementation of the proposed A/R CDM project activity, for example, *inter alia*, emissions from soil preparation, from the use of machinery and from the use of fertilisers.

Identify all GHG emission sources in the project boundary using the table below, in accordance with the new proposed/approved methodology used. Note that CO_2 emissions or removals resulting from changes in carbon stocks should not be included in this table. Explain whether any emissions sources are excluded in the calculation of actual net GHG removals by sinks, and if so, justify their exclusion. If possible, use the table provided below.

Sources	Gas	Included/ Excluded	Justification/Explanation
E.g. use of fertilisers…	CO_2		
	CH_4		
	N_2O		
	CO_2		
	CH_4		
	N_2O		

A.4.4. Carbon pools selected

>>

In calculating the baseline net GHG removals by sinks and/or actual net GHG removals by sinks, project participants may choose not to account for one or more carbon pools and/or emissions of the GHG measured in units of CO_2 equivalents, while avoiding double counting. This is subject to the provision of transparent and verifiable information that the choice will not increase the expected net anthropogenic GHG removals by sinks. Project participants shall otherwise account for all significant changes in carbon pools and/or emissions of the GHG measured in units of CO_2 equivalents by the sources that are increased as a result of the implementation of the proposed A/R CDM project activity, while avoiding double counting.

Select carbon pools that are considered in determining actual net GHG removals by sinks and baseline net GHG removals by sinks in the table opposite, in accordance with the proposed new/approved methodology used. Note that the same carbon pools should be considered in the actual explanations and justifications for the choice in the table.

Carbon pools	Selected (answer with yes or no)	Justification/Explanation
Aboveground trees		
Belowground trees		
Dead wood		
Forest floor (litter)		
Soil organic carbon		

For more guidance, see *Section 2.3 Step 6 iii.*

A.4.5. Assessment of the eligibility of land

>>

In order to define afforestation or reforestation, project participants shall follow the definition for "forest" selected by the host Party, which specifies:

- A single minimum tree crown cover value between 10 and 30 percent; and
- A single minimum land area value between 0.05 and 1 hectare; and
- A single minimum tree height value between 2 and 5 meters.

The definition for forest selected by each Party can be found on the Designated National Authority page of the UNFCCC CDM website.

Please specify how the project fulfils the definition of afforestation or reforestation and eligibility of the land, as provided in the glossary of terms (Annex A), using the following procedures:

1. Provide evidence that the land within the planned project boundary is eligible as an A/R CDM project activity following the steps outlined below:
   (a) Demonstrate that the land at the moment the project starts is not a forest by providing information that:
      i. The land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decisions 11/CP.7 and 19/CP.9, as communicated by the respective Designated National Authority; and
      ii. The land is not temporarily unstocked as a result of human intervention, such as harvesting or natural causes, or is not covered by young natural stands or plantations which have yet to reach a crown density or tree height in accordance with national thresholds and which have the potential to revert to forest without human intervention.
   (b) Demonstrate that the activity is a reforestation or afforestation project activity:
      i. For reforestation project activities, demonstrate that on 31 December 1989, the land was below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority.
      ii. For afforestation project activities, demonstrate that the land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority, for a period of at least 50 years.
2. In order to demonstrate steps 1(a) and 1(b), project participants shall provide one of the following forms of verifiable information:
   (a) Aerial photographs or satellite imagery complemented by ground reference data; or
   (b) Ground based surveys (land use permits, land use plans or information from local registers such as cadastre, owners register, land use or land management register); or
   (c) If options (a) and (b) are not available/applicable, project participants shall submit a written testimony which was produced by following a participatory rural appraisal methodology.

Participatory rural appraisal is an approach to the analysis of local problems and the formulation of tentative solutions with local stakeholders. It makes use of a wide range of visualisation methods for group-based analysis to deal with spatial and temporal aspects of social and environmental problems.

For more guidance, see *Sections 2.3 Step 7* and *2.3 Step 12*.

A.4.6. A description of legal title to the land, current land tenure, and land use and rights of access to the sequestered carbon

>>

A.4.7. Type(s) of A/R CDM project activity

>>

Please use the list of types of A/R CDM project activities and registered A/R CDM project activities by type available on the UNFCCC CDM web site. Please specify the type(s) of A/R CDM project activities into which the proposed A/R CDM project activity falls.

If no suitable type(s) of A/R CDM project activities can be identified, please suggest a new type(s) descriptor and its definition, being guided by relevant information on the UNFCCC CDM web site.

A.4.8. Technology to be employed by the proposed A/R CDM project activity

>>

This section should include a description of environmentally safe and sound technologies and know-how that will be employed by the project, specifying, if any, those to be transferred to the host Party(ies).

A.4.9. Approach for addressing non-permanence

>>

In accordance with paragraph 38 and section K of the CDM A/R modalities and procedures, please specify which of the following approaches to addressing non-permanence has been selected:

- Issuance of tCERs
- Issuance of lCERs

A.4.10. Duration of the proposed A/R CDM project activity/crediting period

>>

A.4.10.1. Starting date of proposed A/R CDM project activity and of (first) crediting period, including a justification

>>

The crediting period shall begin at the start of the A/R CDM project activity under the CDM. The starting date of an A/R CDM project activity is the date on which the implementation or real action of the project activity begins, resulting in actual net GHG removals by sinks.

At its 21st meeting, the CDM Executive Board clarified that the provisions of paragraphs 12 and 13 of Decision 17/CP.7 do not apply to CDM A/R project activities. A CDM A/R project activity starting after 1 January 2000 can also be validated and registered after 31 December 2005, as long as the first verification of the project activity occurs after the date of registration of this project activity.

Given the crediting period starts at the same date as the starting date of the project activity, projects starting from 2000 onwards can accrue tCERs/lCERs as of the start date.

Should be specific, i.e., DD/MM/YYYY. Proof of starting date should be made available to the Designated Operational Entity.

A.4.10.2. Expected operational lifetime of the proposed A/R CDM project activity

>>

Please state the expected operational lifetime of the proposed A/R CDM project activity in years and months as appropriate.

Should equal or exceed the length of the crediting period.

A.4.10.3. Choice of crediting period and related information:

>>

Please state whether the proposed A/R CDM project activity will use a renewable or a fixed crediting periods and complete A.4.10.3.1 or A.4.10.3.2 accordingly. A4.10.3.1 and A.4.10.3.2 are mutually exclusive – please select only one of them.

At its 21st meeting, the CDM Executive Board clarified that the provisions of paragraphs 12 and 13 of Decision 17/CP.7 do not apply to CDM A/R project activities. A CDM A/R project activity starting after 1 January 2000 can also be validated and registered after 31 December 2005, as long as the first verification of the project activity occurs after the date of registration of this project activity. Given the crediting period starts at the same date as the starting date of the project activity, projects starting from 2000 onwards can accrue tCERs/lCERs as of the start date.

Select **one** of fixed or renewable. That is, either A.4.10.3.1 or A.4.10.3.2 should be filled in, not both.

A.4.10.3.1. Renewable crediting period, *if selected*

>>

Each crediting period shall be a maximum of twenty (20) years and may be renewed at most two times, provided that, for each renewal, a Designated Operational Entity determines and informs the CDM Executive Board that the original project baseline is still valid or has been updated, taking account of new data where applicable.

Please state the length of the crediting period in years and months as appropriate.

A.4.10.3.1.1. Starting date of the first crediting period

>>

Date should not be before the start of the project activity.

A.4.10.3.1.2. Length of the first crediting period

>>

A.4.10.3.2. Fixed crediting period, *if selected*

>>

Fixed crediting period shall be at most thirty (30) years. Please state the length of the crediting period in years and months. The total crediting period should not exceed the expected lifetime of the project activity.

A.4.10.3.2.1. Starting date

>>

Date should not be before the start of the project activity.

A.4.10.3.2.2. Length of the crediting period

>>

A.4.11. Brief explanation of how the net anthropogenic GHG removals by sinks are achieved by the proposed A/R CDM project activity, including why these would not occur in the absence of the proposed A/R CDM project activity, taking into account national and/or sectoral policies and circumstances

>>

Please briefly explain how net anthropogenic GHG removals by sinks are to be achieved (detail is provided in Section B) and provide the estimate of the anticipated total net anthropogenic GHG removals by sinks in tonnes of CO_2-equivalent, as determined in Section E. This section should provide a summary of Section B.3 and have a maximum length of one page.

A.4.11.1. Estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period:

>>

Please provide the total estimate of net anthropogenic GHG removals by sinks, as well as annual estimates for the chosen crediting period. Information on net anthropogenic GHG removals by sinks shall be indicated using the table format overleaf.

Years	Annual estimation of net anthropogenic GHG removals by sinks in tonnes of CO_2-equivalent (CO_2e)
Year A	
Year B	
Year C	
Year …	
Total estimated net anthropogenic GHG removals by sinks (tonnes of CO_2e)	
Total number of crediting years	
Annual average over the crediting period of estimated net anthropogenic GHG removals by sinks (tonnes of CO_2e)	

A.4.12. Public funding of the proposed A/R CDM project activity

>>

In the case where public funding from Parties included in Annex I is involved, please provide information in Annex 2 on the sources of public funding for the project activity from Parties included in Annex I, which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from, and not counted towards, the financial obligations of those Parties.

If public money from an Annex I country is used to fund the project, then the relevant Ministry of the Annex I country should provide a letter confirming that there is no diversion of overseas development assistance. Details should be provided in Annex 2. If there are no public funds involved, then this should be clearly stated in this section.

SECTION B: Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the proposed A/R CDM project activity

>>

Please refer to the UNFCCC CDM website for the title and reference list, as well as the details of approved baseline methodologies. Please note that the table "Baseline Information" contained in Annex 3 is to be prepared in parallel to completing the remainder of this section.

B.1.1. Justification of the choice of the methodology and its applicability to the proposed A/R CDM project activity

>>

Please justify the choice of methodology by showing that the proposed A/R CDM project activity meets the applicability conditions under which the methodology is applicable.

Discuss every one of the applicability conditions and how your project is appropriate to these conditions.

B.2. Description of how the methodology is applied to the proposed A/R CDM project activity

>>

Please explain basic assumptions of the baseline methodology in the context of the proposed A/R CDM project activity and show that the key methodological steps were followed in determining baseline scenario for the proposed A/R CDM project activity. Provide the key information and data used to determine the baseline scenario (variables, parameters, data sources, etc.) in table format.

B.3. Description of how actual net GHG removals by sinks are increased above those that would have occurred in the absence of the registered A/R CDM project activity

>>

Explanation of how and why this project is additional, and therefore not the baseline scenario, in accordance with the selected baseline methodology. Include: 1) a description of the baseline scenario determined by applying the methodology, 2) a description of the project scenario, and 3) an analysis showing why the *baseline* net GHG removals by sinks scenario would likely lie below *actual* net anthropogenic GHG removals by sinks in the project scenario.

Use the additionality tool. See *Section 2.3 Step 11* and *Annex C.*

B.4. Detailed baseline information, including the date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline

>>

Please attach detailed baseline information in Annex 3.

Please provide date of completion in DD/MM/YYYY format.

Please provide contact information and indicate if the person/entity is also a project participant listed in Annex 1.

SECTION C: Application of a monitoring methodology and of a monitoring plan

This section shall provide a detailed description of the monitoring plan, including identification of the data and its quality with regard to accuracy, comparability, completeness and validity, taking into consideration any guidance contained in the methodology. The monitoring plan is to be attached in Annex 4. The monitoring plan should provide detailed information related to the collection and archiving of all relevant data needed to:

- estimate or measure verifiable changes in carbon stocks in the carbon pools and the emissions of GHG occurring within the project boundary;
- determine the baseline; and
- identify increased emissions outside the project boundary.

The monitoring plan should reflect good monitoring practice appropriate to the type of A/R CDM project activity. The plan should follow the instructions and steps defined in the approved monitoring methodology. Project participants shall implement the registered monitoring plan and provide data, in accordance with the plan, through their monitoring report.

Please note that data monitored and required for verification and issuance are to be kept for two years after the end of the (last) crediting period.

C.1. Title and reference of approved monitoring methodology applied to the project activity

>>

Please refer to the UNFCCC CDM website for the name and reference as well as details of approved methodologies.

If a national or international monitoring standard has to be applied to monitor certain aspects of the proposed A/R CDM project activity, please identify this standard and provide a reference to the source where a detailed description of the standard can be found.

Please fill in the section below in accordance with the approved monitoring methodology selected.

C.2. Justification of the choice of the methodology and its applicability to the proposed A/R CDM project activity

>>

Please justify the choice of methodology by showing that the proposed A/R CDM project activity and its context meet the conditions under which the methodology is applicable.

Make sure all applicability conditions are discussed.

C.3. Sampling design and stratification

Describe the sampling design that will be used in the project for the ex-post calculation of actual net GHG removals by sinks and, in the case where the baseline is monitored, the baseline net GHG removals by sinks. The sampling design shall describe, *inter alia*, stratification, determination of number plots, plot distribution, etc.

C.4. Monitoring of the baseline net GHG removals by sinks and the actual net GHG removals by sinks

C.4.1. Actual net GHG removals by sinks data

C.4.1.1. Data to be collected or used in order to monitor the verifiable changes in carbon stock in the carbon pools within the project boundary resulting from the proposed A/R CDM project activity, and how this data will be archived

ID number (Please use numbers to ease cross-referencing to D.3)	**Data variable**	**Source of data**	**Data unit**	**Measured (m), calculated (c) or estimated (e)**	**Recording frequency**	**Proportion of data to be monitored**	**How will the data be archived?** (e.g., paper, electronically)	**Comment**

C.4.1.2. Data to be collected or used in order to monitor the GHG emissions by the sources, measured in units of CO_2-equivalent, that are increased as a result of the implementation of the proposed A/R CDM project activity within the project boundary, and how this data will be archived

ID number (Please use numbers to ease cross-referencing to D.3)	**Data variable**	**Source of data**	**Data unit**	**Measured (m), calculated (c) or estimated (e)**	**Recording frequency**	**Proportion of data to be monitored**	**How will the data be archived?** (e.g., paper, electronically)	**Comment**

C.4.1.3. Description of formulae and/or models used to monitor the estimation of the ex-post actual net GHG removals by sinks

C.4.1.3.1. Description of formulae and/or models used to monitor estimation of verifiable changes in carbon stock in the carbon pools within the project boundary (in units of CO_2-equivalent for each pool)

>>

Formulae and/or models should be consistent with the formulae and/or models outlined in the description of the baseline methodology.

C.4.1.3.2. Description of formulae and/or models used to monitor estimation of the GHG emissions by the sources, measured in units of CO_2-equivalent, that are increased as a result of the implementation of the proposed A/R CDM project activity within the project boundary (for each source and gas, in units of CO_2-equivalent)

>>

Formulae and/or models should be consistent with the formulae and/or models outlined in the description of the baseline methodology

C.4.2. As appropriate, relevant data necessary for determining the ex-post baseline net GHG removals by sinks and how such data will be collected and archived, if required

ID number (Please use numbers to ease cross-referencing to D.3)	**Data variable**	**Source of data**	**Data unit**	**Measured (m), calculated (c) or estimated (e)**	**Recording frequency**	**Proportion of data to be monitored**	**How will the data be archived?** (e.g., paper, electronically)	**Comment**

C.4.2.1. Description of formulae and/or models used to monitor estimation of the ex-post baseline net GHG removals by sinks (in units of CO_2-equivalent for each carbon pool), if required

>>

Formulae and/or models should be consistent with the formulae and/or models outlined in the description of the baseline methodology.

The formulae to be provided if the baseline net GHG removals by sinks is estimated base on ex-post monitored data. Only include if the baseline is not fully defined before the start of project activities.

C.5. Treatment of leakage in the monitoring plan

>>

Please indicate if leakage will be directly or indirectly monitored. If leakage is not monitored during the implementation of the proposed A/R CDM project activity, please explain rationale behind it. Please state if not applicable.

C.5.1. If applicable, please describe the data and information that will be collected in order to monitor leakage of the proposed A/R CDM project activity

ID number (Please use numbers to ease cross-referencing to D.3)	**Data variable**	**Source of data**	**Data unit**	**Measured (m), calculated (c) or estimated (e)**	**Recording frequency**	**Proportion of data to be monitored**	**How will the data be archived?** (e.g., paper, electronically)	**Comment**

C.5.2. Description of formulae and/or models used to estimate leakage (for each GHG, source, carbon pool, in units of CO_2-equivalent)

>>

Formulae and/or models should be consistent with the formulae and/or models outlined in the description of the baseline methodology.

C.5.3. Please specify the procedures for the periodic review of implementation of activities and measures to minimise leakage

>>

C.6. Description of formulae and/or models used to estimate ex-post net anthropogenic GHG removals by sinks for the proposed A/R CDM project activity (in units of CO_2-equivalent for each GHG carbon pool)

>>

Formulae and/or models should be consistent with the formulae and/or models outlined in the description of the baseline methodology

C.7. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data (indicate table and ID number , e.g., 3.1.; 3.2.)	**Uncertainty level of data** (High/Medium/Low)	**Explain QA/QC procedures planned for these data, or why such procedures are not necessary**

Refer to data items in tables contained in C.4 and C.5, as applicable.

C.8. Please describe the operational and management structure(s) that the project operator will implement in order to monitor both actual GHG removals by sinks and any leakage generated by the proposed A/R CDM project activity

>>

C.9. Name of person/entity determining the monitoring methodology:

>>

Please provide contact information and indicate if the person/entity is also a project participant listed in Annex 1 of this document.

SECTION D: Estimation of net anthropogenic GHG removals by sinks

D.1. Estimate of the ex-ante actual net GHG removals by sinks

>>

Please provide estimated sum of verifiable changes in carbon stocks, minus the increase in emissions (measured in units of CO_2-equivalent) by the sources that are increased as an attributable result of the implementation of the proposed A/R CDM project activity within the project boundary (in units of CO_2-equivalent for each gas, pool, sources, formulae/algorithm).

Estimates should be derived following the methods detailed in the baseline section (Section II) of the approved methodology.

D.2. Estimated ex-ante baseline net GHG removals by sinks

>>

Estimates should be given in units of CO_2-equivalent for each carbon pool, sources, etc.

Estimates should be derived following the methods detailed in the baseline section (Section II) of the approved methodology.

D.3. Estimated ex-ante leakage

>>

Please provide estimate of any leakage, defined as: the increase of anthropogenic emissions by sources of GHG which occurs outside the project boundary, and that is measurable and attributable to the proposed A/R CDM project activity.

Estimates should be given in units of CO_2-equivalent for each gas, sources, etc. Please state if not applicable.

Estimates should be derived following the methods detailed in the baseline section (Section II) of the approved methodology.

D.4. The sum of D.1 minus D.2 minus D.3, representing the ex-ante net anthropogenic GHG removals by sinks of the proposed A/R CDM project activity

>>

D.5. Table providing values obtained when applying formulae above

>>

The ex-post calculation of baseline net GHG removals by sinks may only be used if proper justification is provided.

Notwithstanding, the baseline net GHG removals by sinks shall also be calculated ex-ante and reported in the CDM A/R PDD. The result of the application of the formulae above shall be indicated using the following tabular format.

Year	Estimation of baseline net GHG removals by sinks (tonnes of CO_2-e)	Estimation of actual net GHG removals by sinks (tonnes of CO_2-e)	Estimation of leakage (tonnes of CO_2-e)	Estimation of net anthropogenic GHG removals by sinks (tonnes of CO_2-e)
Year A				
Year B				
Year C				
Year …				
Total (tonnes of CO_2-e)				

Estimates should be derived following the methods detailed in the baseline section (Section II) of the approved methodology.

SECTION E: Environmental impacts of the proposed A/R CDM project activity

E.1. Documentation on the analysis of the environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary of the proposed A/R CDM project activity

>>

This analysis should include, where applicable, information on, *inter alia*, hydrology, soils, risk of fires, pests and diseases. Please attach the relevant documentation to the CDM-AR-PDD.

Include any impacts on: biodiversity, local air quality, water resource availability, water resource quality, soil contamination, soil erosion, use of natural resources, chemical usage and disposal, waste management.

E.2. If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken an environmental impact assessment, in accordance with the procedures required by the host Party, including conclusions and all references to support documentation

>>

Please attach the documentation to the CDM A/R PDD.

E.3. Description of planned monitoring and remedial measures to address significant impacts referred to in Section E.2.

>>

All mitigation efforts should be clearly stated.

SECTION F: Socio-economic impacts of the proposed A/R CDM project activity

>>

F.1 Documentation on the analysis of the socio-economic impacts, including impacts outside the project boundary of the proposed A/R CDM project activity

>>

This analysis should include, where applicable, information on, *inter alia*, local communities, indigenous peoples, land tenure, local employment, food production, cultural and religious sites and access to fuelwood and other forest products. Please attach the documentation to the CDM-AR-PDD.

F.2. If any negative impact is considered significant by the project participants or the host Party, include a statement that project participants have undertaken a socio-economic impact assessment in accordance with the procedures required by the host Party, including conclusions and all references to support documentation

>>

Please attach the documentation to the CDM A/R PDD.

F.3. Description of planned monitoring and remedial measures to address significant impacts referred to in Section F.2

>>

SECTION G: Stakeholders' comments

>>

G.1. Brief description of how comments by local stakeholders have been invited and compiled

>>

Please describe the process by which comments by local stakeholders have been invited and complied. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted. In this regard, project participants shall describe an A/R CDM project activity in a manner which allows the local stakeholders to understand the proposed A/R CDM project activity, taking into account confidentiality provisions of the CDM modalities and procedures.

G.2. Summary of the comments received

>>

Please identify stakeholders that have made comments and provide a summary of these comments.

G.3. Report on how due account was taken of any stakeholder comments received

>>

Please explain how due account have been taken of comments received from stakeholders.

ANNEX I: Contact information on participants in the proposed A/R CDM project activity

Organization:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Make sure all project participants listed in the second column of Table A.3. are included here and that the information is consistent between Annex 1 and Table A.3.

ANNEX 2: Information regarding public funding

Please provide information from Parties included in Annex I on sources of public funding for the proposed A/R CDM project activity, which shall provide an affirmation that such funding does not result in a diversion of Official Development Assistance, and is separate from and not counted towards the financial obligations of those Parties.

If public funding is included, documentation included with the PDD should include a letter from the host Party Designated National Authority stating that:

1. There is no objection to the inclusion of the funding in the CDM project;
2. The money is not included as Official Development Assistance and is not counted towards any development financial obligations.

ANNEX 3: Baseline information

Please provide a table containing the key elements used to determine the baseline for the proposed A/R CDM project activity, including elements such as variables, parameters and data sources. For approved methodologies, you may find a draft table on the UNFCCC CDM website.

ANNEX 4: Monitoring plan

The monitoring plan needs to provide detailed information related to the collection and archiving of all relevant data needed to:

- estimate or measure verifiable changes in carbon stocks in the carbon pools and the emissions of GHGs occurring within the project boundary;
- determine the baseline; and
- identify increased emissions outside the project boundary.

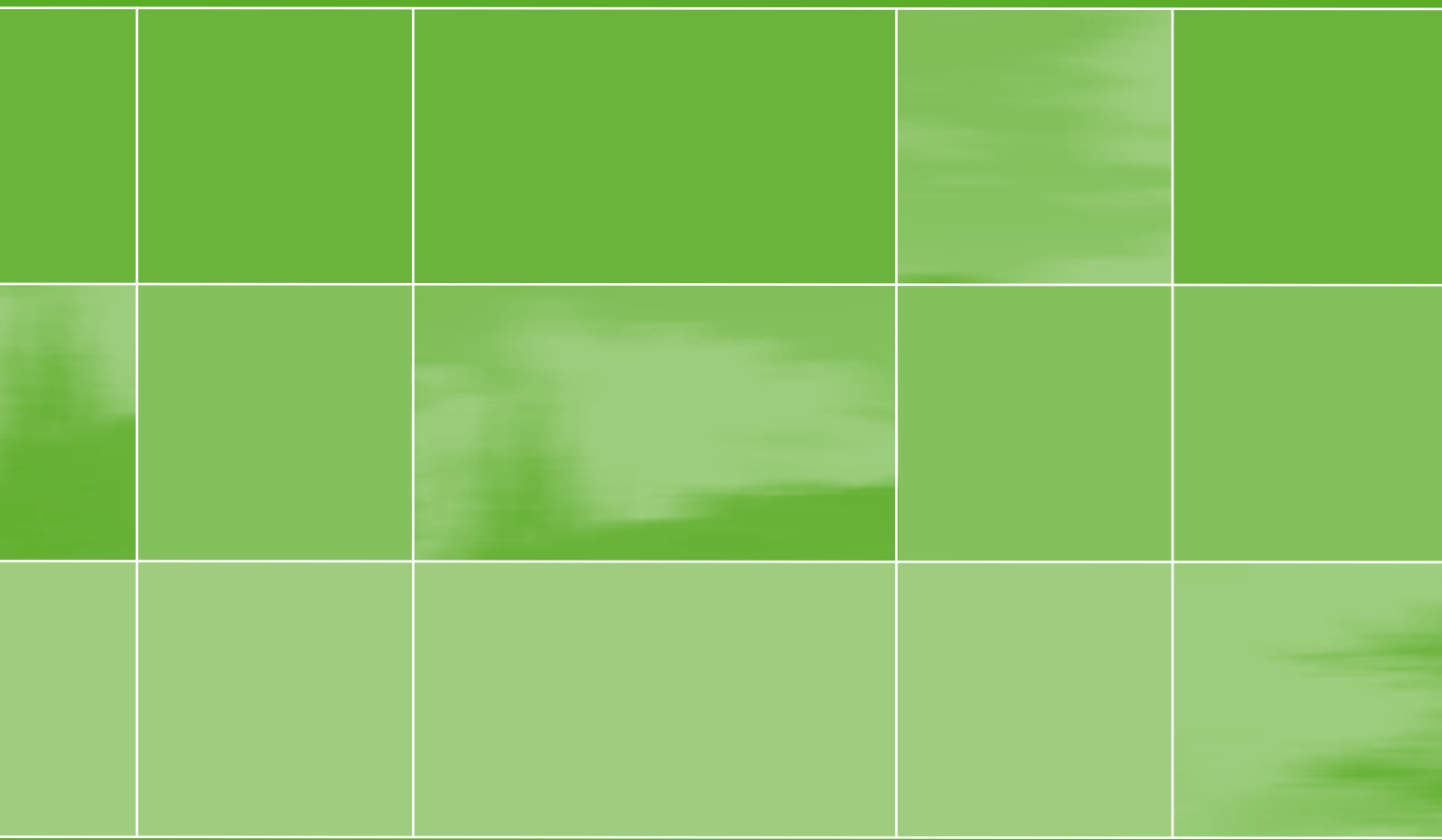
The monitoring plan should reflect good monitoring practice appropriate to the type of A/R CDM project activity. The plan should follow the instructions and steps defined in the approved monitoring methodology. Project participants shall implement the registered monitoring plan and provide data, in accordance with the plan, through their monitoring report.

Please note that data monitored and required for verification and issuance are to be kept for two years after the End of the (last) crediting period.

Monitoring plan should include:

- boundaries of area that will be monitored;
- means by which data will be collected and archived;
- frequency of measurements;
- how leakage will be assessed and estimated;
- quality assurance and quality assurance plans to assure high quality of collected data;
- how non-greenhouse gas environmental impacts will be assessed; and
- measurement methods not fully detailed in body of PDD.

It is important that the plan should allow future verification to be as simple and cost-effective as possible.



INTERNATIONAL TROPICAL TIMBER ORGANIZATION

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