UNITED NATIONS
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FRAMEWORK CONVENTION ON CLIMATE CHANGE - Secretariat
CONVENTION - CADRE SUR LES CHANGEMENTS CLIMATIQUES - Secrétariat

FCCC/WEB/2002/12 4 September 2002

METHODOLOGICAL ISSUES

LAND USE, LAND-USE CHANGE AND FORESTRY: DEFINITIONS AND MODALITIES FOR INCLUDING AFFORESTATION AND REFORESTATION ACTIVITIES UNDER ARTICLE 12 OF THE KYOTO PROTOCOL

Views from organizations on issues related to modalities for the inclusion of afforestation and reforestation project activities under the clean development mechanism in the first commitment period

1. The Conference of the Parties (COP), by its decision 17/CP.7, requested the Subsidiary Body for Scientific and Technological Advice (SBSTA) to develop definitions and modalities for including afforestation and reforestation project activities under the clean development mechanism in the first commitment period, taking into account the issues of non-permanence, additionality, leakage, uncertainties and socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, and being guided by the principles in the preamble to decision -/CMP.1, (*Land use, land-use change and forestry*) (FCCC/CP/2001/13/Add.2).

2. The SBSTA, at its sixteenth session, agreed on terms of reference and an agenda for the work referred to in paragraph 1 above. It invited Parties and organizations to submit their views on issues related to modalities for the inclusion of afforestation and reforestation project activities under the clean development mechanism in the first commitment period. The deadline for the submission of this information was 20 August 2002 (FCCC/SBSTA/2002/6, annex I).

3. The secretariat has received twelve submissions from Parties; these are contained in document FCCC/SBSTA/2002/MISC.22.

4. The secretariat has received six submissions from organizations. In accordance with the procedure for miscellaneous documents, these submissions are reproduced* in the language in which they were received and without formal editing.

* In order to make these submissions available ono electronic systems, including the World Wide Web, these submissions have been electronically imported. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

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"Non-permanence"

Reforestation or afforestation activities sequester atmospheric carbon and can thus help offset the environmental impact of greenhouse gas emissions. Forestry projects under the Kyoto Protocol's Clean Development Mechanism (CDM), potentially offer an opportunity to sequester significant amounts of carbon at relatively low cost[1].

Carbon uptake and re-release (i.e. emissions) from forested areas is a natural part of the carbon cycle. However, there are risks that the net carbon uptake from a CDM forestry project may be reduced at some point by re-release into the atmosphere, e.g. as a result of fire or pest attack. This reduction in carbon stocks is the "permanence" issue. Re-release of carbon stored in afforestation or reforestation (A/R) CDM projects could result in reversing the climate benefits of projects, and could even increase global emissions.

Different crediting regimes that could be set up to credit forestry projects. These different crediting regimes affect the crediting lifetime of a project and incentives to encourage long-term sequestration. The design of these regimes can therefore be used to manage the environmental and economic impacts of premature carbon release from a project. Decisions on credit allocation need to be taken at an international level.

The risks of unplanned carbon stock reduction can be significant, particularly for some project types, such as monoculture plantations, and in some locations, such as in areas at high risk of encroachment. A reduction in carbon stocks can occur through natural or human-induced causes, and can have a severe impact on carbon stocks. Indeed, at extremes, a carbon stock reduction may entirely reverse the GHG mitigation impacts of a project. However, some of the physical risks to carbon sequestration can be managed or minimised. Assessing the importance of different risks, and planning the project accordingly, are important steps in risk mitigation and management.

There are several different ways in which credits from afforestation or reforestation (A/R) CDM projects could be allocated to project investors over time[2]. How credits are allocated, over what time period, and with what liability provisions influences the economic incentives for investors to maintain a project. The options by which a crediting scheme could encourage long-term sequestration in projects, or reduce the environmental impact of a carbon stock reduction, are to:

- Issue "permanent" emission credits, but with the greatest proportion of credits being generated towards the end of the crediting lifetime;
- Issue "temporary" emission credits (e.g. as in the "Colombian proposal"); or
- Issue credits that reflect the environmental benefit of temporary sequestration (i.e. by using ton-year accounting).

Most crediting regimes would allocate permanent emissions credits for forestry projects. Permanent emission credits would remain valid indefinitely, i.e. would be able to be used for compliance purposes even in the event of a carbon stock reduction. There are different ways in which permanent credits can be

[1] Forestry projects can also have other (non-GHG) environmental impacts, including benefits such as reduced soil erosion or increased timber/food supply.

[2] There are fewer possibilities for crediting regimes for energy/industry projects because emission reductions generated by these projects are "permanent", and also because monitoring may take place every year (unlike forestry projects).

allocated to projects. For example, all credits could be allocated in line with actual stock change, or with simplified or average sequestration over a particular time period. Alternatively, some or all credits could be withheld (e.g. under a delayed crediting or buffered crediting regime) until sequestration has been maintained for a specified time period. A third option would be to set up a "ton-year" crediting regime that allocates short-term sequestration activities small credits to reflect the environmental benefit of delaying (rather than reducing) a rise in GHG emissions.

Alternatively, afforestation and reforestation projects could generate temporary credits for project-based sequestration, such as that proposed in the "Colombian proposal". These temporary credits could either require credits to be "repaid" after a specified time period - irrespective of whether or not the sequestration that generated the credits was maintained or allow credits to remain valid (and be used for compliance purposes) as long as the sequestration remained in place. This latter approach is called "renewable temporary crediting". However, if sequestration was reversed, the validity of credits would cease.

The Kyoto Protocol outlines certain criteria that need to be fulfilled in order for CDM projects to generate certified emission reductions (CERs). One of these is that projects need to lead to "real, measurable and long-term" benefits. Most of the crediting regimes explored cannot ensure this in the event of carbon stock reduction occurring. For example, credits allocated under the actual stock change regime would reflect real and measurable benefits. But if no liability were attached to the credits, the benefits would not be long-term if carbon sequestration was reversed. Under an average storage regime, credits would not represent "real" reductions in any particular year, although they would do over the whole crediting lifetime of a project if sequestration was permanent. And while setting up a ton-year crediting scheme could ensure long-term benefits, credits would not reflect measurable benefits in any given year of crediting because of the assumptions needed to calculate these benefits.

The Marrakech Accords affirm that reversal any removal due to land-use, land-use change and forestry activities should be able to be accounted for "at the appropriate point in time". Unless liability provisions are attached to credits generated from forestry projects, only regimes that allocate short term and temporary credits can fulfil these criteria: permanent credits cannot, by definition, be recalled or rescinded in the event of a carbon stock reduction.

Table 1: **Environmental implications of different crediting regimes for a slow-growing CDM re/afforestation project**

Crediting regime	Does this crediting regime ensure that credits allocated are			Can it account for carbon stock reduction?*
	Real	Measurable	Long-term	
Actual stock change	++	++	--	No
Average or simplified**	Can vary from – to + (depending on crediting timeline)	Can vary: - or +	Can vary: -- to +	No
Delayed crediting	++	++	++	Partially
Buffered crediting	++	+	++	Partially
Ton-year	+	--	++	Yes
Expiring temporary credits	+	+	-	Yes
Renewable temporary crediting	++	++	+	Yes

* Assuming no liability rules are allocated to credits

** Credits allocated under the average crediting regime will only represent "real" benefits over the crediting lifetime if sequestration is permanent.

The three crediting regimes that come closest to both encouraging and reflecting real, long-term and measurable GHG project benefits are “delayed full crediting”, “buffered crediting”, and “renewable temporary crediting”. However, the delayed full crediting regime is unattractive, both from an economic and compliance point of view, as credits are only obtained far into the future. The “buffered crediting” regime would encourage long-term sequestration, but would also result in a low risk of issuing permanent credits for sequestration that was subsequently reversed.

Allocating temporary, but renewable, credits for the GHG benefits of forestry projects could result in credits representing both real and measurable benefits. It would also limit the environmental effects of a reduction in carbon stocks.

Additionality and crediting lifetime

Different project types can be “additional” for different lengths of time.

Crediting lifetimes of A/R projects may need to be longer - and potentially considerably longer - than crediting lifetimes for projects in the energy/industry sectors. This is because the benefits from A/R projects may accrue over longer periods of time than benefits from energy/industry projects. Furthermore (depending on which crediting regime is chosen for A/R projects), long crediting lifetimes may be needed to ensure that their potentially reversible benefits are indeed long-term.

Some potential crediting lifetimes for A/R projects could be established objectively, such as those that mirror the actual timing of carbon sequestration in a particular project. However, some crediting regimes would need subjective choices on crediting lifetime, such as those that require carbon to be sequestered over X years before credits are allocated. The potential use of subjective criteria in determining how long a project should receive credits for can result in wide variations in crediting lifetime.

Further information

Further analysis on this issue can be found in the OECD/IEA Information Paper COM/ENV/EPOC/IEA/SLT(2001)11: “Forestry Projects: Permanence, Credit Accounting and Lifetime”. This can be downloaded from http://www.oecd.org/pdf/M00023000/M00023450.pdf

PAPER NO. 2: PRIMA KLIMA

Forest-based carbon mitigation projects: Options for carbon accounting and for dealing with non-permanence

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Introduction

Since the signing of the Kyoto Protocol in 1997 many options have been proposed to account for emission s and removals of greenhouse gases from Land Use, Land Use Change and Forestry (LULUCF). These have attempted to deal with both quantification of benefits and the risk of loss of benefits resulting from further change of land use or disturbance. Many proposals have focused on afforestation, reforestation and deforestation (ARD) examples and the impact of such projects under the Protocol's flexibility mechanisms, especially Joint Implementation (JI) and the Clean Development Mechanism (CDM). The acceptance of revegetation, forest management, agricultural land management and grazing land management in Article 3.4 has resulted in a wider scope of project options. This underlines the necessity for carbon accounting systems that will properly reflect benefits to the environment and atmosphere in dealing with permanence, while also providing incentive to implement projects. This paper takes some representative profiles of carbon uptake from LULUCF and sequestration activities, and uses them to evaluate GHG-accounting and liability-assignment options that attempt to balance these issues. This evaluation includes general consideration of issues common to all accounting approaches, assessing the ability of various approaches to meet the criteria for LULUCF accepted at the seventh session of the Conference of the Parties (COP7) to the UNFCCC, and examining the distribution of benefits and liabilities under different approaches over time.

This paper deals with technical issues of GHG accounting and liabilities associated with land-based sequestration of carbon. It is recognized that other impacts of land-use projects also matter. For example, managing carbon in terrestrial ecosystems also has potential impact on biodiversity and sustainable development strategies. This important connection has been clearly enunciated in the UNFCCC and is confirmed in the Marrakech Accords. It is not specifically dealt with in the paper but identified as an essential consideration when evaluating carbon sequestration projects.

We use four hypothetical cases of "net carbon sequestration" over time in order to illustrate the carbon accounting and liability-assignment options (Figure 1). With "net carbon sequestration" we mean the difference between project scenario and baseline scenario. We believe that these four cases capture the most important scenarios and project types that can occur.

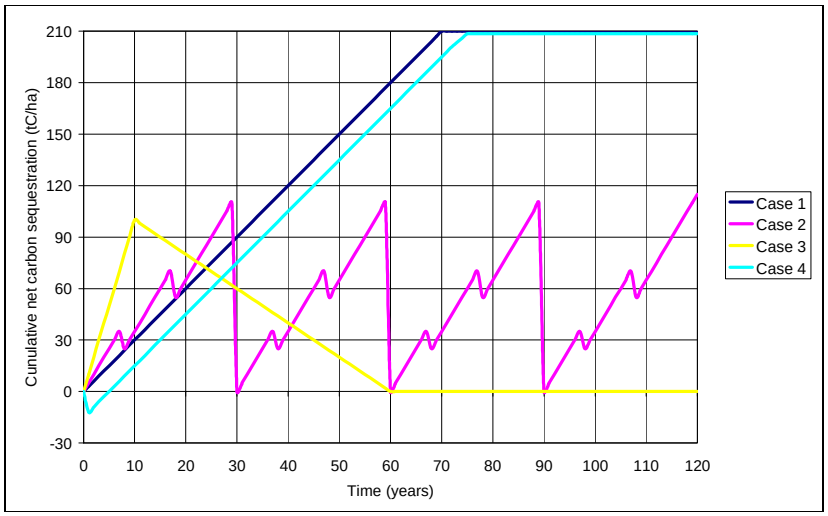


Figure 1: Four hypothetical cases of net carbon sequestration over time.

Case 1: Gradual increase of carbon benefits. For example, afforestation/reforestation for conservation (establishing a forest cover for conservation purposes, i.e. without intent to harvest). This example could also include some selective cutting, in which case the curve would not be as smooth, and possibly lower.

Case 2: Intermittent increase of carbon benefits. For example, afforestation/reforestation with consecutive harvest. In this simplified example, carbon is sequestered and released at harvest (or transferred to other carbon pools such as wood products).

Case 3: Carbon benefits that diminish over time. For example, disturbance control, reduced impact logging, or single rotation plantations. This type of project may not create long-term climate benefits, the carbon benefits are impermanent as the project scenario approaches the baseline scenario eventually. Therefore, it may not meet one of the key criteria of the CDM ("long term benefits for mitigation of climate change", KP Article 12). That is, this project has a "non-permanence" case built into it already in the project plan.

Case 4: Initial carbon loss followed by long-term carbon benefit. For example, reforestation through conversion of coppice vegetation to high forest. This reflects an initial carbon loss due to vegetation removal and/or initial soil carbon loss from site preparation.

1. Carbon accounting options: how much and when

For the purpose of this paper, carbon accounting options describe the amount and timing of credits and debits from projects and activities at the international level, i.e., under the Kyoto Protocol. This includes two main questions: 1) When are credits and debits issued, and 2) how much of credits and debits is issued relative to the GHG emissions and removals actually occurring on the land.

Several methods have been proposed for carbon accounting. We selected three methods for the illustrative purposes of this paper, but acknowledge that many more combinations may be possible. For LULUCF sector reporting by Annex I countries, it has already been agreed under the Protocol that the "Stock Change" (SC) approach will be used. Therefore, the discussion in the paper focuses on carbon accounting for projects in non-Annex I countries (CDM projects), and project accounting within Annex 1 countries (at the subnational level). The following options are envisioned:

1) The SC method gives credit as carbon stocks increase and debit as they decrease. It reflects the impact on the atmosphere at any time. Concerns with this accounting approach arise in relation to multiple carbon-credit transactions when carbon stocks increase and decrease at different times, for example, due to stand growth, thinning and harvesting.

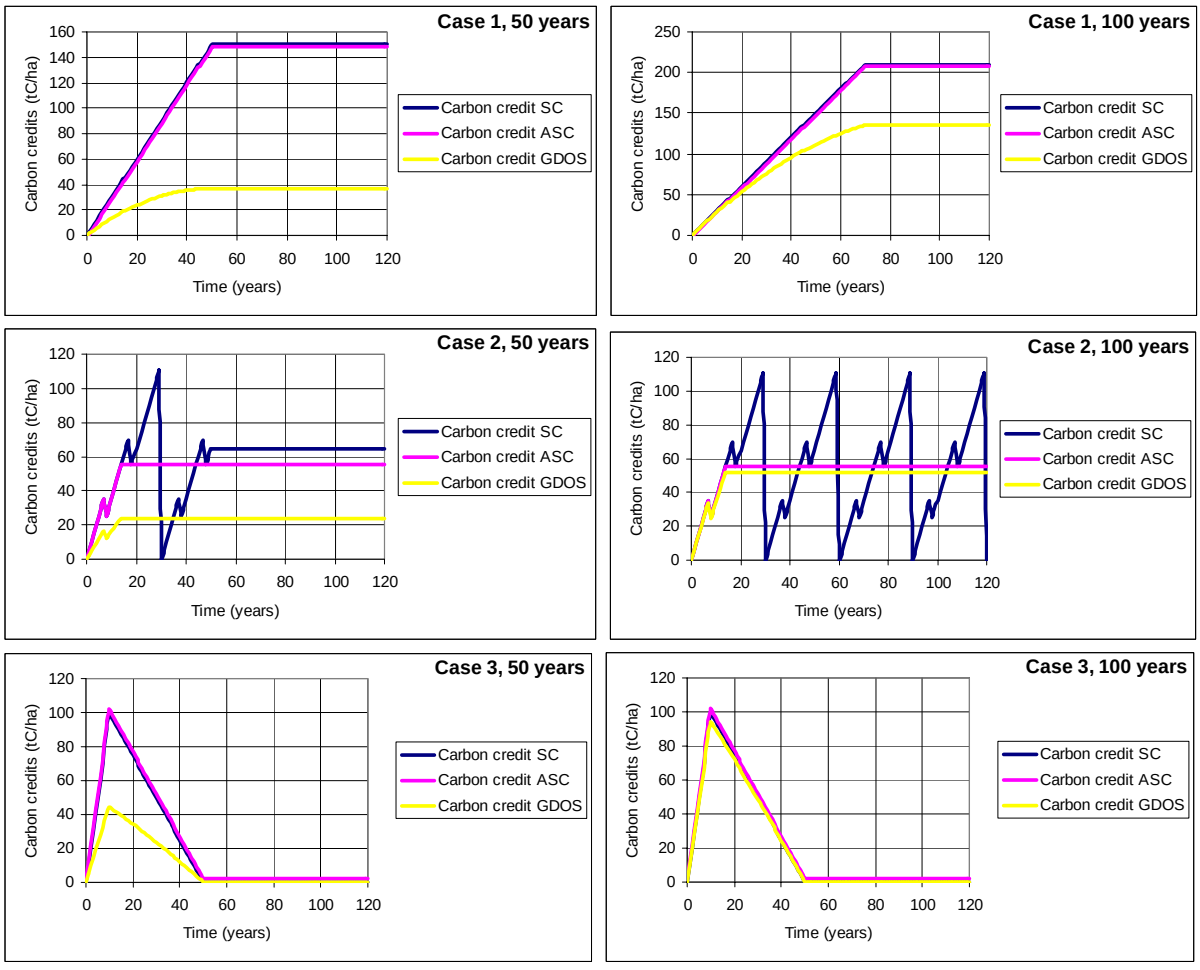
2) The "Average Storage" (AS) method calculates the average increase in carbon stock. The net carbon gain resulting from the project is averaged over time[1] thereby avoiding the need for successive credits and debits

[1] The average carbon stock for projects with a certain periodicity is calculated over one period (e.g., harvest cycle). This is preferred, rather than choosing a fixed time horizon, because a fixed time horizon can lead to arbitrary results,

to account for carbon stock changes over time. Carbon credit issuance follows the cumulative net gain in carbon stock until the average carbon level is reached, after which no more credits are issued. Once this average storage level is reached, only additional plantings on new areas can result in additional carbon rewards.

3) The "Guaranteed Duration of Storage" (GDOS) approach discounts credit based on a verified ability to guarantee a specified period of storage of the sequestered carbon stocks relative to a 100-year period. Where this period is shorter than 100 years, credit is discounted proportionately. Credit is reversed in relation to reductions in credited stocks at any time. This approach minimizes credit (and debit) for relatively short-term projects or those that cannot demonstrate sustainability. Here it is illustrated in combination with an averaging of carbon stocks as in the AS approach. This method provides the least incentive to implementing short-term forestry projects.

Figure 2 illustrates these three options using cases 1, 2, 3 and 4 and project durations of 50 and 100 years. SC credits and debits follow the growth curve, including at harvesting events, until the end of the project. For cases 1 and 4 the SC and the AS approaches yield the same results, whereas in case 2 the AS approach is significantly different. In the GDOS approach, where there is commitment to continue the project for 50 years, carbon sequestered in year one is discounted to 50%, carbon sequestered in year two to 49% etc. Where there is a 100-year project commitment, carbon sequestered in year one receives full credit with subsequent years discounted.



depending on the carbon stock at the end of the time horizon (which could be very low or very high, depending on where in the harvest cycle the time horizon ends).

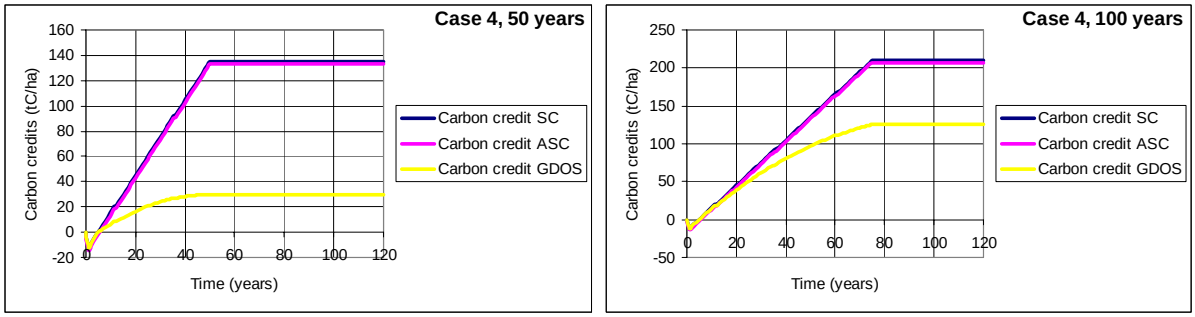


Figure 2: Carbon credits under the SC, AS and GDOS accounting approaches, applied to three hypothetical cases, with project durations of 50 and 100 years

Figure 2 illustrates that in all cases the GDOS approach yields the lowest credits. GDOS does provide an incentive for projects to last as long as possible, as illustrated by the difference between the 50 and 100-year diagrams. In order for the GDOS approach to yield equal credits as the other approaches, however, the project duration would have to be very long (150 years in Case 1, for example). The AS approach gives the same results as the SC cases except where harvesting or thinning is involved. Where an initial loss of carbon stocks occurs (case 4, 50 years), there is an initial debit. However, in practice this will depend on whether the initial loss occurs within or before a commitment period. If, for example, the stock change over the first commitment period is negative, then such a project is unlikely to succeed. On the other hand, there may be projects with a carbon loss from say 2002 until 2005 and credit thereafter. As a result of this scenario, it is important that LULUCF projects account for net carbon from the point of inception of the project and for some projects this may be from 2000 onwards. This will prevent any initial debts from being ignored if they do not lie within a commitment period.

Another aspect becomes obvious in case 2 for the SC accounting method. Given the limited project duration, the carbon stocks at the end of the crediting period may be at low or high levels, depending on the timing of harvesting events relative to the duration of projects. This could open the door to maximization of credits at the end of the project by choice of project duration. The problem can be avoided by using the AS accounting method, or by adopting strict liability rules.

There may not be a need for a generic decision between these accounting options. Elements of the different approaches could be combined. For example, it could be decided by the COP that by default the accounting parties use the SC method, but in certain defined circumstances (highly variable carbon stocks, e.g. due to harvest-regeneration cycle; commercial plantations) the use of the AS method would be allowed.

The AS method smoothes out the temporal fluctuations of carbon stocks. Another way of smoothing the temporal fluctuations of carbon stocks in individual projects is through “pooling”, i.e. including many projects into a larger unit for which carbon accounting and verification is done in aggregate. Pooling can:

- Provide risk management services against unintended release of carbon from individual projects by fire, pests, disease etc, through retention of a buffer of credits at the pool level.
- Normalize carbon flows by spatially offsetting cyclic gains and losses from individual projects.
- Facilitate access to the range of professional services required, including verification.
- Aggregate smaller carbon holdings into marketable parcels.

For all of these carbon accounting options it is possible to use a buffer of retained credits[2], which is progressively disbursed over the project life, as risk is effectively managed and the stock change can be

[2] The size of the retained buffer of credits could be determined by studies to calculate risk over project timeframes. It is arguable that climate change-related impacts and risk should be managed in this way, in addition to “normal” risks such as fire, pests etc.

substantiated. This could also provide an ongoing cash stream for monitoring, management and verification.[3]

2. Liabilities: who and at what times

In the case of non-permanent carbon stocks[4] it is important that some entity under the Kyoto system is liable for any unplanned carbon emissions from projects, or emissions following the projects. For LULUCF activities taking place in Annex I countries (Article 3.3 and 3.4 of the Kyoto Protocol) this is addressed at the national level by the requirement for governments to account for any carbon losses on the same lands in future commitment periods. However, in the CDM, where the host country does not have a national cap for emissions, the liability issue is more complex and needs to be resolved. SBSTA has established a process with the objective of finding a solution to the permanence issue by COP9.

It is important to distinguish between liability in the context of the Kyoto Protocol accounting (where carbon credits are accounted at the national level), and liability at the sub-national level, as specified by national law and in the (probably confidential) project contracts between different private entities. In the context of the CDM there may be a mix of liability at the government level (Annex I country only, because the non-Annex I country does not have an emissions cap or AAU accounting) and at the level of private entities. Liability is also an issue for projects carried out domestically in Annex I countries: Annex I governments may want to protect themselves against being held liable for non-performance of projects by sub-national entities.

At the government level, liability can be with the seller country (but most likely not in the CDM, see above), the buyer country, or a third party such as an insurance company[5]. Also, responsibility for carbon stocks changing over time could be in relation to a "control period", during which an agreement to maintain a change in stocks is in place. This could be the period of an agreement to temporarily store atmospheric carbon (expiring credits and rental), the term of a project plan (as illustrated above), or a period set by authorities external to the project, including the Kyoto Protocol as further elaborated, or a combination of these.

The table below gives an overview of options for allocating liability during and beyond a projects' "control period". The details of the different options for assigning liability, shown in the left column of the table, are elaborated in the sections that follow.

Table 1: overview of liability options

	Liability during "control period"	Liability after "control period"
Seller liability	S	S
Buyer liability	B	B
Insurance	I	I
Colombian / rental	S	B
Ton-year type	None	None

2.1 Seller liability, buyer liability, (insurance)

Liability can be with the buyer or the seller. Liability and risk may also be managed through insurance. It is already common for timber crops to be insured. Both buyer and seller could protect themselves against

[3] The buffer should reflect the real risk related to the project, which in the case of carefully managed and protected forests may be quite small. Overly large buffers underestimate the true benefit to the atmosphere and subsequent under-crediting results in a disincentive to implement projects.

[4] For an in-depth discussion of why land-use projects differ in this respect from projects involving the reduction of fossil-fuel combustion see Schlamadinger and Marland, 2000.

[5] Governments would probably not insure themselves against non-permanence, and thus the insurance option is more likely to be used at the level of sub-national accounting.

liabilities at any time during or after the control period. However, the unknown future cost of emission permits may make insurance for their future replacement prohibitively expensive.

2.2 Ton year accounting

The ton-year approach can be used both as an accounting methodology and also as a means of addressing liabilities. It assumes that the sequestration of 1 ton of carbon (tC) for a given period of time is equivalent to an avoided emission of 1tC, and credit is awarded progressively over this timeframe, after which there are no further liabilities. Because the Marrakech Accords confirm that release of credited stocks must result in reversal of credit awarded at the appropriate time, the ton year approach is not considered further in this paper.

2.3 Temporary CERs or carbon rental

A number of proposals have been put forward that contain the underlying assumption that LULUCF projects are non permanent, and that offset carbon may only be stored for a limited or minimum period of time, after which it may be re-released in the atmosphere. Such proposals include expiring CERs ('Colombian proposal'), carbon 'rental' (Marland et al., 2001) and carbon 'leasing' (Moura Costa, 1996 and 2002). The basic assumption is that the project host guarantees the carbon to be stored for an agreed period. After this period the default assumption is that the carbon is re-emitted to the atmosphere. The buyer of the credits has various options upon expiry of the guaranteed period: 1) to renew the contract, 2) to replace the credits from the temporary storage with credits from another temporary storage project, 3) to replace the credits with new credits from a permanent offset (e.g., energy-type project), 4) to invest in a domestic activity to reduce emissions, or 5) it may turn out that the buyer is in compliance even though the "default" emission from the CDM LULUCF project is accounted for – in this case no action would be needed.

At the government level the CER is thus always considered temporary and will further be referred to as a tCER[6]. Provided there is ongoing liability for re-emission, the continued environmental integrity of the atmospheric greenhouse gas benefit is ensured.

The following questions are key to understanding and defining the 'rules' of national carbon rental:

1) ***What is the lifetime, expiry date or rental period, of a tCER?***
   a) A fixed lifetime – which could be specified and required by the COP to the UNFCCC (a 'top-down' approach), e.g. 5, 10, 20 or 100 years (the same length for all projects);
   b) *A non-fixed lifetime* – which would be proposed by the project developers and therefore could be different lengths of time (based on project planning and verification visits).

2) ***What happens when the tCER expires?***
   It is agreed that ongoing liability is required and this can be achieved using the following options: extending the tCER on the original project (tCER renewal), or replacing the tCER with either a permanent CER or tCERs from another CDM forestry project. The choice of which option is used could either be specified by the parties to the UNFCCC, proposed by projects, or a combination of both.

[6] There are multiple options for private contracts in the 5 year tCER option: Investors could buy the entire "harvest" of tCERs for the project duration (e.g., 50 years), and would thus bear the risk of non-permanence of the carbon stocks during the project. Or the investor could buy the 5-year pieces one at a time, and thus the risk would stay with the project host. For example, if the forest disappeared in year 6, then the host could not sell the second tranche of tCERs. As a third option, the buyer could buy a "guaranteed" long-term stream of tCERs, meaning liability would be with the seller or an insurance (Cyril Loisel, pers. comm).

3) ***Should there be a minimum lifetime for a LUCF project?***
Given the temporary nature of the tCER product and therefore the opportunity for projects to sell tCERs for short periods (e.g. 5 years), should there be a restriction put on projects, by COP, in terms of a minimum project lifetime, for example to ensure that they provide environmental benefits?

4) ***For how long should a project be eligible for producing credits?***
The Marrakech Accords have agreed that energy-sector mitigation projects can receive carbon credits for only a limited number of years – for one 10-year period or for an initial 7-year period with the possibility of renewal for 2 additional 7-year periods. This limitation confronts the baseline issue by acknowledging that we do not know where the normal sequence of technological development would have taken us even in the absence of a mitigation project. Such a limitation may be counter-productive in the land-use sector where management of mature forests and native vegetation requires a longer vision; and limiting the period for credits could give inappropriate advantage to industrial forest plantations, usually unrelated to the objectives of maintaining or augmenting biodiversity or accomplishing sustainable forest management.

5) ***Should there be a limit to the period over which tCERs can be rented?***
In any event, the maximum rental period must not be longer than the lifetime of the project. Even if the Kyoto-accounted expiry of tCERs is 5 years, the contract between project host and investor could run for a much longer time, that is, establish longer rental periods. In such a case the government-level accounting of tCERs would occur in 5-year intervals, whereas the private-level liabilities would go beyond that and would be unaffected by the 5-year accounting.

6) ***Which accounting methodology is used to calculate the number of tCERs generated over the rental period?***
Any method may be used. Refer to Section 1 for descriptions.

7) ***Should tCERs be issued at the time when carbon stocks have accumulated and been verified, followed by the rental period? Or should tCERs be issued only after carbon stocks have been safeguarded for a certain time (e.g., 5 years)?***
In Article 3.3 (afforestation and reforestation activities) the RMUs are created at the same time when carbon is sequestered and measured. In the case of CDM projects there may be two different options: A) tCERs could be issued at the time when the carbon is sequestered and the expiry would be calculated from this time forward. B) tCERs could be issued ex post for a carbon stock that has been accumulated since 2000 and kept in place, for example, for the last five years. In case A there must be seller liability between issuance and expiry of the tCER, whereas in case B there would not be any seller liability (because a temporary storage is already proven to have been achieved). The advantage is thus that, although there is no government-level emissions cap and thus liability to the non-Annex I country government, there is still liability coverage at all times.

8) Should tCERs from carbon sequestration prior to 2008 be bankable as in energy projects?

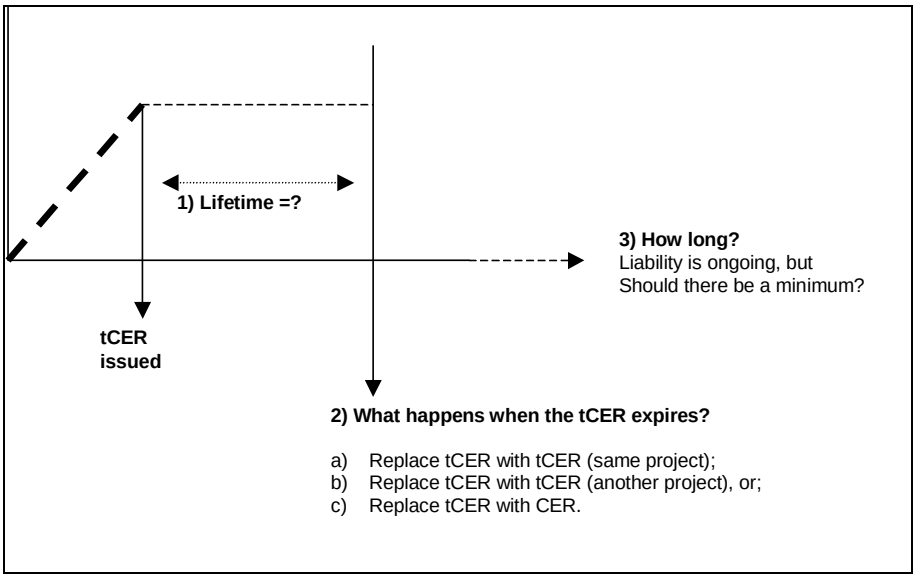


Figure 3: Schematic representation of some of the questions relating to tCERs and carbon rental.

A number of different options for regulating the rental of tCERs are proposed, including how tCERs would be incorporated into national greenhouse gas accounting procedures:

Option 1: The tCER rental period (plus expiry date) is determined by the project developers, based on project planning, verification visits, investor and developer needs, and so on. No specification on the replacement method after expiry is made. No minimum project lifetime.

Option 2: As per option 1, but with a minimum project lifetime specified by COP of 'x' years.

Option 3: The COP specifies a fixed lifetime for tCERs of 5 years. No specification on the replacement method after expiry is made. There is no minimum project lifetime. tCERs are issued *ex ante* at the time when a stock measurement is done, and expire 5 years later. For example, if a stock measurement is done in 2009, then tCERs can be counted in year 2009 during the first commitment period, and expire in 2014 during the second. One potential problem with this option is that it allows issuance of tCERs based on a carbon measurement in 2009, and allows to use these tCERs for compliance in the first commitment period, but without checking beyond 2009 whether the guarantee of 5-year storage is kept. For example, a re-emission in the period 2009-2012 would be left unaccounted, thus constituting a postponement of commitments to future commitment periods.

Option 4: As per option 3, but the tCER are issued *ex post* at the end of each commitment period[7], and the 5-year periods over which carbon has been stored coincides with the 5-year commitment periods. This option would address the issue of unaccounted carbon losses in the first commitment period, mentioned under option 3 above. Thus, there would never be any seller liability, because tCERs are always based on already completed carbon-storage "services".

[7] The issuance of tCERs at the end of the CP would be consistent with the issuance of RMUs (from Articles 3.3 and 3.4) which will have to be done at the end of the commitment period unless one accepts recalculation of RMUs issued annually.

Box: Option 4, "Ex-post" issuance of tCERs after carbon stocks have been kept for 5 years.

A project would report at the end of each commitment period the amount of carbon that was present, on average, over the preceding 5 years. This could be done in several ways. One could A) take the arithmetic mean of the net carbon stocks (over and above the baseline scenario) at the beginning and the end of the commitment period, or B) measure the net carbon stocks around the middle of the commitment period. In any case, the goal is to establish a proxy for the time-averaged (over the commitment period) difference between project and baseline carbon stocks. This option would automatically also give credit for any carbon sequestered after the project start (later than year 2000) and before 2008, because the "net carbon stocks" in the commitment period contain some carbon that was accumulated during that period.

tCERs would be issued at the end of each commitment period[8], and would reflect carbon benefits over the last 5 years. They would be transferred from the host country to the investor country where they would be converted into AAUs for use in the first commitment period. At the same time, and this is the main difference to energy-type projects, a "Liability Unit" (L-unit) would be created which expires five years later, i.e., at the end of the second commitment period (see Table 1). At the end of the second commitment period the CDM project will most likely create further tCERs. These new tCERs will exceed the tCERs in the first commitment period if the project manages to further enhance net carbon benefits. These new tCERs will again be transferred to the Annex I country and converted into AAUS and L-units. At the same time, the L-units from the first commitment period expire. If the new AAUs exceed the expiring L-units, then there will be a net benefit for the Annex I country.

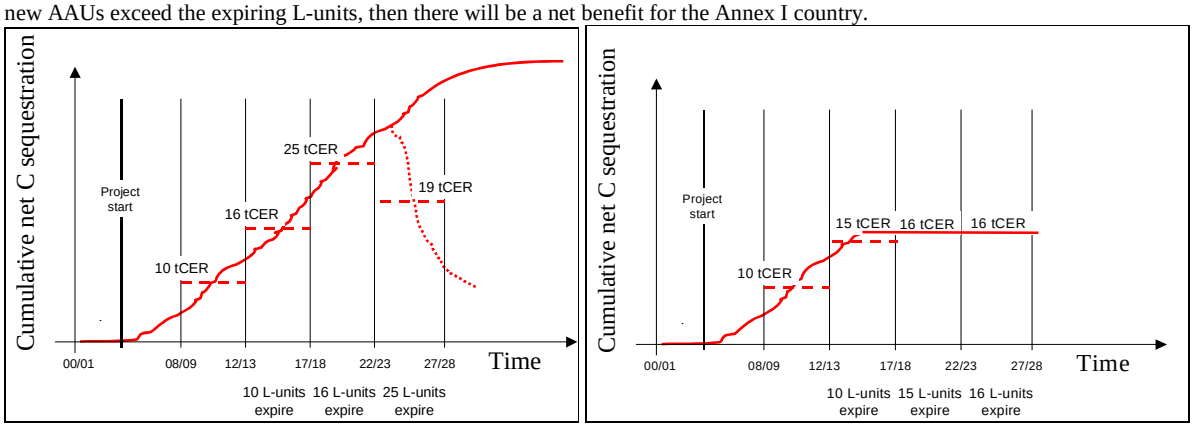


Figure 4: Cumulative net carbon sequestration over time. This is the net gain of the project scenario over the baseline scenario. tCERs are issued in relation to the average net carbon stocks of the last 5 years. The left diagram is based on the SC accounting approach, the right on the AS approach.

Table 1: Issuance and transfer of (t)CERs, and issuance of AAUs, in a hypothetical project that produces a net carbon benefit of 1 ton in the first commitment period, and no further benefits thereafter. If this is an energy project, then only the text in regular font applies. If it is an LULUCF project, then in addition the italicised text applies.

	Non Annex I country	**Annex I country**
Commitment period 1	• 1 *(t)*CER issued in non-Annex I country • 1 *(t)*CER deducted from non-Annex I country	• 1 *(t)*CER added to Annex I country • 1 *(t)*CER converted into 1 AAU • *1 L-unit created (5 yr duration)*
Commitment period 2	• *1 tCER issued in non-Annex I country* • *1 tCER deducted from non-Annex I country*	• *1 tCER added to Annex I country* • *1 tCER converted into 1 AAU* • *1 L-unit expires, and deducted from Annex I country AAU account* • *1 L-unit created (5 yr duration)*

[8] Note that: 1) While tCERs are issued at the end of the commitment period, trading of credits could commence earlier, for example using futures. 2) The approach proposed here does not imply that all projects must be verified at once at the end of the commitment period (this would create logistical problems for the verifiers). The schedule for measurements could differ from the schedule for issuance of tCERs which is at the end of the CP. For example, a main measurement could be undertaken around the middle of the commitment period to form the basis for estimating the average stock during the commitment period. A brief check towards the end of the commitment period would suffice to confirm that no major unplanned events took place since the main measurement.

2.4 Carbon sequestration property rights and contracts at the sub-national level

Ultimately it will be important that the international accounting and liability rules for Parties to the Kyoto Protocol, and the liability and accounting rules for sub-national entities, are compatible. This raises questions in relation to "carbon sequestration property rights" and contracts for carbon transactions between sub-national (and multinational) entities.

As noted in the earlier section on international liability, seller country liability during and following a sequestration project is enabled for projects in Annex 1 nations through ongoing national stock change reporting for "Kyoto lands". Under the CDM however, there is no national inventory or commitment to limit emissions, and tCERs with buyer liability have been proposed. For this reason these two cases are discussed separately.

Projects in the CDM

It has been argued that in the case of the CDM seller country liability may unduly infringe national sovereignty and land use flexibility. This may be particularly the case if long project time frames or perpetual carbon storage are required. For these reasons buyer-nation liability has been proposed, in the form of expiring credits (tCERs). If this system is adopted, nations may purchase tCERs in order to meet national commitments. Nations might also allow sub-national entities within their economies to directly purchase expiring credits to meet their company level emission reduction requirements.

Because nations are ultimately liable, they would have to ensure that sub-national entities are held liable to replace expiring credits, unless the governments decided to absorb the risk of any liabilities. In any event, it may be desirable to harmonize international and sub-national systems in terms of the timeframes for temporary credits, and necessary for nations to have legal remedies against the risk of default on the obligation for companies to replace expiring credits.

Projects in Annex I countries

A sub-national market for carbon offsets requires clear ownership of carbon credits as well as knowledge of who bears the liability for loss of credited carbon. Otherwise, governments will have to take international liability for losses of "credited" carbon stocks under Articles 3.3 or 3.4, and thus assume this liability from the private sector.

National circumstances will significantly determine how nations translate their reported changes in LULUCF stocks to legally defined rights and responsibilities within their boundaries. However some standardization will be required where it is desired to enable trade by sub-national entities within and between economies.[9]

The right to claim offsets to greenhouse emissions and equally the responsibility for emissions from the land or vegetation may be seen as the natural "property" of the owner of the relevant carbon stocks (in the land and vegetation). However in carbon sequestration projects there are likely to be project contributions from carbon investors who will require a secure "property" right to the credits generated.

Another way of assigning or defining a project's carbon sequestration property rights may be pursuant to a contract or commitment to store the credited stocks for a specified period. This would generally involve an agreed Project Plan and measures for protection of the sequestered stocks for the Plan's duration. The term of the Project Plan would form the control period discussed earlier. The carbon sequestration property rights could then be owned by a carbon investor, or be pooled for the benefits outlined earlier. This approach raises the possibility of a "carbon rights owner" who is different to the "carbon stocks owner".[10]

[9] Not all nations may wish to do so. For example in New Zealand all property rights to carbon sequestration are planned to be been retained by the government.

[10] This legal approach has already been adopted in four Australian States.

There would then be liability of a "carbon rights owner" or "carbon pool" for emissions during the term of a project, and of a "carbon stocks owner", who would generally assume responsibilities and rights in relation to the stocks at the end of the project. Under some accounting approaches the carbon stocks owner would have to manage the risk of being left with contingent liability in the form of unsustainable levels of credited stocks at the end of a project. For example, under the SC accounting approach in the example above, the level of credit claimed during the project can be above the average (sustainable) carbon density of the forest.

Carbon contracts currently take many forms from purchasing project sequestration annually based on measured and verified carbon uptake to buying the complete (predicted) stream of annual benefits of a project up front (ie. purchase of the projects "carbon property rights"). Some buyers, anticipating legislated emission reduction targets in the future, buy "futures contracts" which obligate the seller to provide and buyer to pay for credits at a future date at a specified price. Others purchase "put options" and "call options". Transactions involving future sequestration probably depend in practice on the existence of a binding Project Plan.

Financial benefits and liabilities can be assigned through contracts which obligate the seller, the buyer or a third party to replace credits that are not delivered, or that are later lost. For example, a seller could remove certain liabilities with a force majeure clause, removing obligation to deliver credits where prevented by acts of God or war. In the past many project contracts had a limited lifetime, with no stipulation of who was liable after the project finished. However, claiming credits must always be balanced with liability for re-emission of credited stocks. There may be a role for institutions that are likely to be around in the long-term, such as insurance companies or carbon pools.

3. Criteria for evaluating accounting and liability options

In order to evaluate different combinations of accounting and liability options (Options 1 through 6 in section 4), two levels of criteria were established, acting as "filters" for these combinations (Figure 5).

- Filter 1. The overall basis for eligibility are the 8 principles, in the preamble to draft decision -/CMP 1 of the Marrakech draft accords regarding Land use, land-use change and forestry (http://unfccc.int/resource/docs/cop7/13a01.pdf).
- Filter 2. If the options are fulfilling these general principles, they can be further evaluated against six specific criteria set out for permanence.

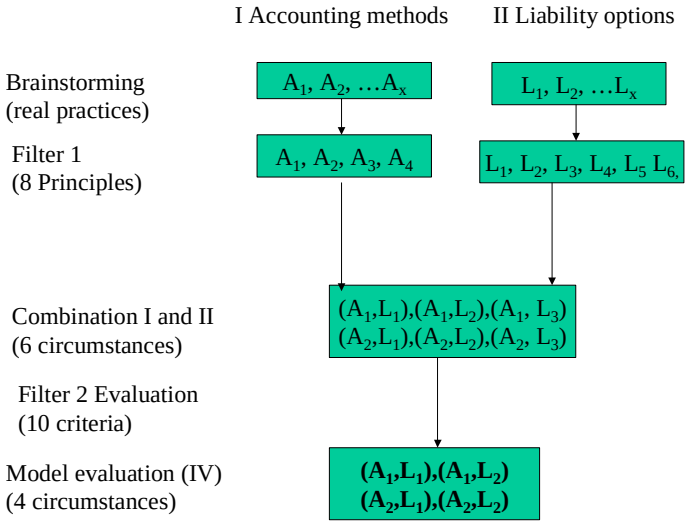


Figure 5: Evaluation of carbon accounting and liability options.

FILTER 1 Overall basis for eligibility is that

a) The treatment of these activities be based on sound science;
b) Consistent methodologies be used over time for the estimation and reporting of these activities;
c) The aim stated in Article 3.1 of the Kyoto Protocol not be changed by accounting for land use, land-use change and forestry activities;
d) The mere presence of carbon stocks be excluded from accounting;
e) The implementation of land use, land-use change and forestry activities contributes to the conservation of biodiversity and sustainable use of natural resources;
f) Accounting for land use, land-use change and forestry does not imply a transfer of commitments to a future commitment period;
g) Reversal of any removal due to land use, land-use change and forestry activities be accounted for at the appropriate point in time;
h) Accounting excludes removals resulting from:
- Elevated carbon dioxide concentrations above their pre-industrial level;
- Indirect nitrogen deposition; and
- The dynamic effects of age structure resulting from activities and practices before the reference year;

FILTER 2 Specific criteria for permanence issue beyond Filter 1:

1. Incentive for action : Is it an incentive for LULUCF projects and /or activities ?
2. Sustainable development : Does it encourage long term activities?
3. Cost effectiveness : Is it cost effective/ are the transactions at a low cost ?
4. Simplicity : Is it easy to understand and implement ?
5. Flexibility, split into the following two aspects:
- Fungibility: Does it allow for fungibility (interchange) of different types of credits (RMU's, AAU's, ERU's, CER's)?
- Land-use flexibility: Does it allow for a (unexpected) withdrawal from the flexible landuse systems ?
6. Environmental integrity : Does it preserve environment integrity of the Kyoto protocol with respect to real GHG emissions and/or removals

The selected criteria in filter two do not act as binary criteria (yes/no). The evaluation of any scenario against them highly depends on the policy or economic context. They should be used as a background to elaborate and improve any proposal.

The combinations of accounting and liability options (Options 1 through 6, see section 4) can be analyzed against the criteria.

- *Incentive for action*. The average storage and stock change approaches give greater incentives than the GDOS approaches when projects have a duration significantly short of 100 years. Whether or not "rental" concepts are used does not matter.
- *Sustainable development*. All options seem to be compatible with sustainable development. Options 3 (GDOS) is relatively more favorable to long-term projects (e.g., creation of new conservation areas), and may thus be seen as superior.
- *Cost effectiveness*. Cost effectiveness is difficult to evaluate a priori. It is highly dependent on a parallel private contract, and the value of carbon over time. Option 6 is probably the most effective, because with the least risk of "non-fulfillment" of the tCERs. Cost effectiveness is also high for option 2 because the monitoring system does not have to account for fluctuations in carbon stocks (thinning, harvesting). Ideally, one would use the AS approach (instead of SC) in option 6, see also the comparison in Figure 4.
- *Simplicity*. Simplicity is a subjective criterion, which may be difficult to evaluate. The practicability of GDOS (option 3) has been questioned, i.e., simplicity may prove to be a problem. Option 6 is simple to use, because tCER's are only issued after successful completion of the sequestration service (see section 4). Option 1 is simple to monitor, but the management of emission permits might require more sophistication. From a monitoring standpoint Option 2 could be seen as superior

once the average carbon levels have been reached, because no year-to-year monitoring of carbon changes is necessary thereafter (monitoring would only have to confirm that the same management regime, tree species, etc. are still in place). Option 6 can be combined with this averaging approach, thus achieving the same level of simplicity in option 6.

- *Flexibility*. The evaluation of flexibility highly depends of the context. Any of the three combinations with carbon rental (options 4, 5 and 6) are considered to be "flexible" because they give the landowner the possibility to change management or land use in the future.
- *Environmental integrity*. … is fully achieved only in those options where C stock changes are monitored continuously (i.e., all options that do not rely on averaging of carbon stocks). When an average net carbon stock is used as basis for crediting, there is no guarantee that C has really been sequestered. Over time, however, and if averaged over larger landscapes, the AS approaches should provide full "environmental integrity".

4 Economic evaluation of combined accounting and liability options

In this section we first analyze the economic implications of the three carbon accounting options from section 2 (SC, AS, GDOS) by calculating the net present value (NPV) of a stream of carbon credits as depicted in Figure 2. We assume a constant (inflation adjusted) carbon price of 5 € and a real discount rate of 5%. Crediting is assumed to commence from the beginning of the project, i.e., it is assumed that the "banking" provision of the CDM applies or projects commence after the beginning of the first Commitment Period.

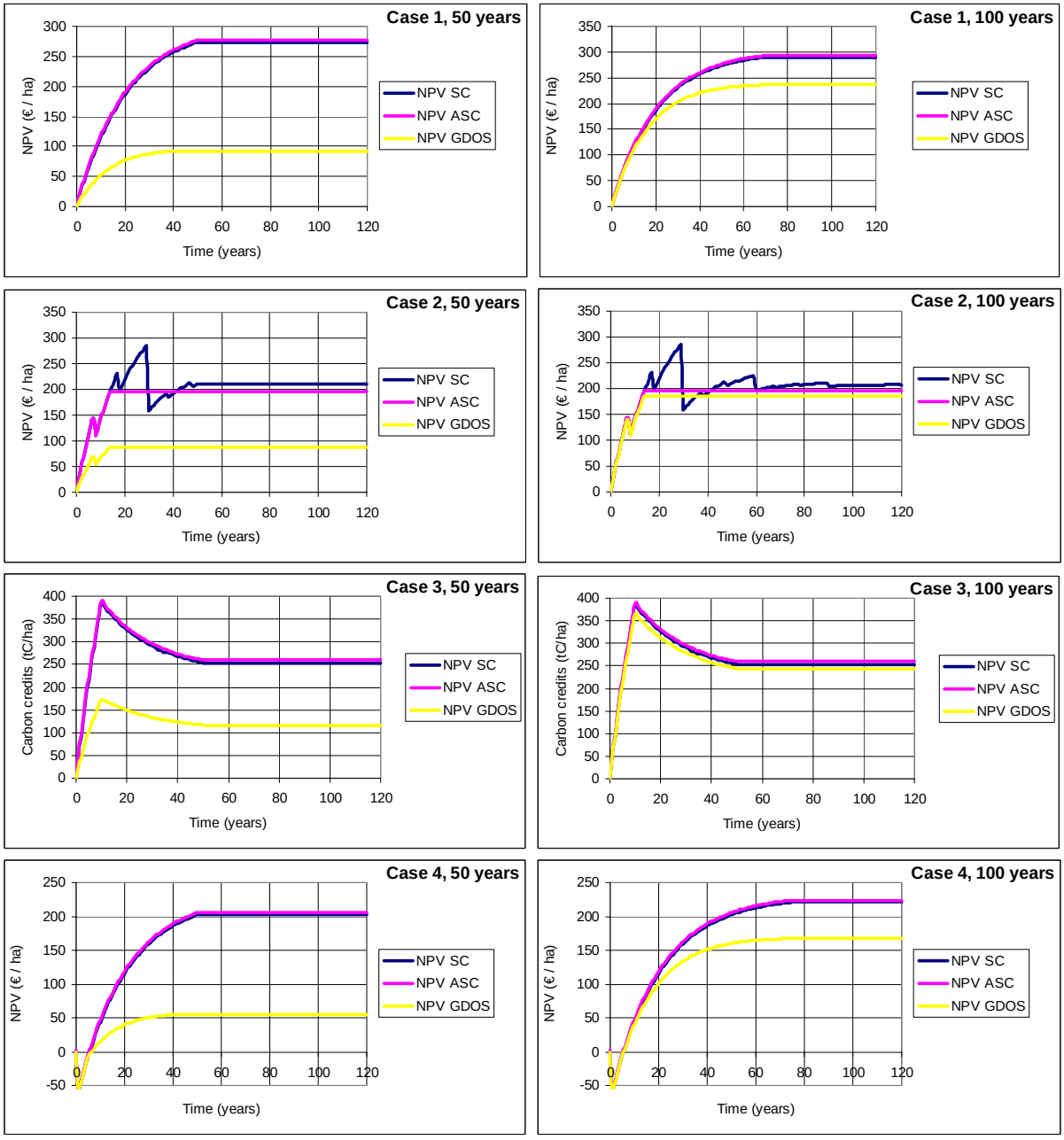


Figure 5: as Figure 2, but instead of carbon credits the discounted value of the stream of carbon credits is shown. The values at any time t represent the discounted value of the stream of credits between time zero and time t. No change in value occurs beyond the duration of the project.

Now we discuss qualitatively how these NPV streams may change if these carbon accounting options are combined with some of the liability options from section 3. The following combinations are looked at:
1) SC accounting with seller liability during project lifetime
2) AS accounting with seller liability during project lifetime
3) GDOS accounting with seller liability during the project lifetime
4) SC accounting with Rental option 1 (tCER duration is flexible, not tied to commitment periods)
5) SC accounting with Rental option 3 (tCER duration is 5 years but not tied to the commitment periods, crediting ex ante)
6) SC accounting with rental option 4 (tCER duration is 5 years tied to the commitment periods, crediting ex post)

Combinations 1, 2 and 3 differ quantitatively with respect to unexpected release of carbon. That is, approaches which award greater credit for sequestration must also effectively impose greater penalties for release. This will be most difficult and of concern if emission-permit prices rise faster than inflation and the opportunity cost of capital. The approaches all rely on liability of the carbon stocks owner for carbon emissions beyond the project duration, and the capacity of the owner to meet this obligation is of concern, particularly in respect of CDM projects. Also, it is not clear how to ensure that the seller can replace carbon released during the project with new credits. Insurance policies or reservation of a credit buffer may be required, thus lowering the NPV of projects.

Options 2 and 3 attempt to reward only the long term (sustainable) increase in carbon stocks due to the project. As applied here, the AS approach minimizes the risk of uncompensated release of credited stocks, relative to SC accounting, because credits (and therefore debits) are limited to the average storage. The GDOS approach is based on discounting short term projects. This discounting reduces the NPV, but also minimise the risk of non-compliance as only stocks independently assessed as sustainable over the project lifetime are credited. It provides an economic driver for very long term project planning, although the practicality of this has been questioned. It has also been argued that minimizing the financial incentives for short and medium term projects could increase the risk of their non-compliance or reduce the likelihood of project uptake in the first place.

Option 4 would entirely adress the problem of accounting carbon releases after the end of the project, as the rental period cannot go beyond the project, and after the rental period the default assumption is a release of the carbon, which is accounted by the investor. However, any releases during the project will still have to be protected by insurance or pooling (i.e. accounted for), thus lowering the NPV. Combination 5 goes one step further in minimizing this, because the tCER duration is only 5 years long. Combination 6 avoids the need for the host to replace credits altogether, because tCERs are only issued after successful completion of the "sequestration service". If an unplanned release occurs prior to issuance of the tCERs, then it comes at the host's expense, because fewer tCERs are issued in the first place. Project hosts may thus still want to protect themselves through pooling or insurance. However, if they do not, it no longer puts the environmental integrity of the Kyoto Protocol at risk.

When comparing rental with purchase of carbon credits, the NPV of those combinations using *ex ante* tCER approaches will not differ significantly from conventional accounting conventions, but *ex post* tCER accounting may delay payments to the project host relative to a project's establishment. However, this would not necessarily reduce the project's NPV, because 1) in the ex-ante variant fewer tCERs would be issued than in the ex-post variant, assuming a steadily increasing carbon stock, and 2) ist is possible to bridge the time until ex-post issuance of the credits, e.g. by means of futures. Private contracts stipulating how long the buyer (investor company, for example) agrees to buy carbon credits may be independent from the national-level accounting in 5-year increments. If, however, the private contract is on the short side, then the project host entity has an incentive to extend the project duration by negotiating another contract in the future. With possible increases of carbon value over time, this incentive would increase.

Disclaimer

This paper was initiated at a workshop organized by IEA Bioenergy Task 38 (www.joanneum.at/iea-bioenergy-task38) and by COST E21 (www.bib.fsagx.ac.be/coste21) in Graz/Austria in April 2002 and was drafted by the individuals listed above. It does not necessarily reflect the opinions or positions of the author's institutions, nor those of IEA Bioenergy Task 38 or COST E21.

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PAPER NO. 3: CLIMATE ACTION NETWORK (CAN)

SUBMISSION BY CAN[1]
ON ISSUES RELATED TO MODALITIES
FOR INCLUDING AFFORESTATION AND REFORESTATION
UNDER ARTICLE 12.
20th August 2002

ABSTRACT

The Climate Action Network (CAN) continues to have serious concerns about he inclusion of sinks. Regarding the modalities for the inclusion of afforestation and reforestation under the CDM, CAN urges parties to:

- effectively and explicitly *exclude mono-culture industrial plantations*.

Furthermore [2],

- *adhere to the principles* of LULUCF decision 11/CP.7 (see Box 1).
- *keep definitions* of afforestation and reforestation as agreed in the Marrakech Accords.
- *reject the Canadian proposal* to shift the 1990 reforestation baseyear.
- *adopt rigorous requirements for continued monitoring/verification* of carbon stocks (e.g. by adopting a T-CER$_5$ accounting approach)
- *assign full debits* for any reemission of sequestered carbon
- *provide strong incentives* for long-term, instead of short-term projects
- *not preclude the exclusion of sinks* in future commitment periods, if issues of additionality, leakage, uncertainties, socio-and environmental impacts, non-permanence, etc. are not satisfactorily resolved.
- require *real additionality* to "without project" case.
- design *standardized methodologies* to develop *project-specific baselines*.
- include a *national, regional and local factors in baseline,* such as socio-economic and legal factors as well as *natural regrowth.*

[1] see Appendix A for a brief description of the Climate Action Network (CAN).

[2] The exclusion of mono-culture industrial plantations from eligible afforestation/reforestation projects under the CDM is highest priority. Other fundamental requirements for the modalities for inclusion of afforestation and reforestation under the CDM are thematically ordered.

- require reasonable project *design elements to avoid leakage.*
- *fully adjust for residual leakage,* that accrues from any displaces demand for land, timber, fuel wood, or other goods and services
- specifically, develop strong modalities to capture *leakage on timber markets.*
- if at all, *err for the benefit of the climate,* regarding the handling of uncertainties.
- apply *good practice guidelines* for estimation of carbon stocks
- apply *strong rules for permanence, additionality, leakage* and other project elements to minimize uncertainty
- *adjust (or "discount") estimates* of project benefits to reflect level of residual uncertainty
- ensure that projects *"…contribute to the conservation of biological diversity and sustainable use of resources"*
- ensure that afforestation and reforestation projects are those that promote *ecosystem restoration with native species* to maximize environmental benefits, such as watershed enhancement, biodiversity and social benefits.
- require that each project has undergone a *mandatory and participatory project design process* prior to its registration.
- ensure that such a process contains, inter alia, *an environmental and social impact assessment,*
- *exclude the use of genetically modified trees* or other organisms and the introduction or use of exotic species.
- ensure that all projects *respect and build upon the rights and needs of Indigenous People and local communities.*
- require ancillary social and environmental benefits of *all* projects.
- design meaningful *public participation and dispute resolution* mechanisms.

PREAMBLE

Parties and other organisations have been invited to present their views on the issues related to modalities for including afforestation and reforestation under the CDM. The Climate Action Network (CAN), a global network of environmental and social NGOs, welcomes this opportunity to submit its views and concerns to the UNFCCC Secretariat for distribution to policy makers.

CAN and its member organisations will engage constructively over the coming years in efforts to try to solve the many outstanding problems resulting from including sinks in the CDM. However, CAN is currently not too optimistic that there are environmentally satisfactory solutions to all or, indeed, any of the problems arising from the inclusion of sinks in the CDM.

CONTENTS

CHAPTER 1 "GENERAL"

I. INTRODUCTION

1. CAN continues to have a number of fundamental concerns about the use of biological sinks under the Kyoto Protocol.

2. Our overarching concern is that carbon sequestration is not the solution to human-induced climate change. It is, at best, a partial solution. Ultimately, the solution is for Parties to reduce their emissions at home, especially energy-related emissions.

3. Over-reliance on sequestration at the expense of emission reductions is likely to prevent countries from achieving the basic goal of climate stabilization. It will slow the rate at which emissions are reduced in earnest and impede technological innovation and institutional momentum needed to propel the transition to climate stabilisation trajectories. It is likely to store up problems for the future when countries emissions may be even harder to reduce.

4. Nevertheless, accounting for afforestation and reforestation under the CDM has been allowed for the first commitment period, on the binding condition that such projects meet a number of crucially important environmental and social requirements. Substantial weight must be given to Article 12.5(b) of the Kyoto Protocol, which requires that projects provide, "Real, measurable, and long-term benefits related to the mitigation of climate change".

5. SBSTA has to design modalities in order to ensure that any CDM sink projects that are non-additional, harm biodiversity or natural ecosystems, have negative socio-economic or environmental impacts, are designed to be only short-term, cause high negative leakage, are subject to high uncertainties, or do not follow the principles laid out in the preamble of decision -/CMP.1 (land use, land-use change and forestry) (see Box 1) are ineligible and ruled out. Furthermore, the accounting rules have to assure that the problems associated with the inherent characteristics of sinks projects, namely uncertainty, leakage and non-permanence, are adequately addressed for all eligible projects. The Marrakech Accords require SBSTA to aim to complete this work at CoP9.

6. CAN calls on parties to design watertight, stringent modalities that address those crucial environmental and social issues. However, it is possible that parties may fail to design adequate modalities or that those modalities might not be adequately enforced. In both cases, the "first commitment period only" experiment of sinks in the CDM should clearly not be prolonged. Thus, parties have to ensure that any adopted accounting scheme and modalities agreed for the first commitment period do not preclude the exclusion of sinks in the second and subsequent commitment periods. (Existing projects from the first commitment period could be rolled over using the TCER accounting mechanism, however.)

7. CAN's overarching position on sinks in the CDM is that short-rotation industrial plantations must be excluded from eligibility. This is due to the high potential of such industrial plantations to create negative environmental and social impacts, their high propensity for leakage at local, regional and global scales, and the relatively abundant existing sources of commercial financing for industrial plantations, among other key issues of concern identified in the Marrakech Accords.

8. CAN supports the development of modalities that will focus afforestation and reforestation efforts on projects aimed at restoring natural forests and enhancing livelihood security and sustainability for relatively impoverished rural and peri-urban populations. These are extremely important global policy priorities for which there is a conspicuous lack of adequate funding. A

carefully targeted set of eligible afforestation and reforestation projects in the CDM would help redress this, and is also most consistent with minimizing some of the key problems associated with the inclusion of sinks in the CDM.

9. CAN urges SBSTA to reiterate that all afforestation and reforestation projects applying for validation and registration under Article 12 must comply with the definitions and modalities still to be agreed. There should be no prompt start for CDM sink projects until agreement is reached.

10. This document presents CAN's views on the issues related to modalities for including afforestation and reforestation under the CDM. The following sections present CAN's concerns and positions on the issues: Chapter 1: general/introduction (I); plantations (II), definitions (III), non-permanence (IV), additionality (V), leakage (VI), uncertainties (VII) and socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems (VIII).

Box 1: Principles in Preamble of Decision -/CMP.1 (land use, land-use change and forestry 11/CP.7) (FCCC/CP/2001/13/Add.1, page 56)

Affirms that the following principles govern the treatment of land use, land-use change and forestry activities:
(a) That the treatment of these activities be based on sound science;
(b) That consistent methodologies be used over time for the estimation and reporting of these activities;
(c) That the aim stated in Article 3, paragraph 1 of the Kyoto Protocol not be changed by accounting for land use, land-use change and forestry activities;
(d) That the mere presence of carbon stocks be excluded from accounting;
(e) That the implementation of land use, land-use change and forestry activities contributes to the conservation of biodiversity and sustainable use of natural resources;
(f) That accounting for land use, land-use change and forestry does not imply a transfer of commitments to a future commitment period;
(g) That reversal of any removal due to land use, land-use change and forestry activities be accounted for at the appropriate point in time;
(h) That accounting excludes removals resulting from: (i) elevated carbon dioxide concentrations above their pre-industrial level; (ii) indirect nitrogen deposition; and (iii) the dynamic effects of age structure resulting from activities and practices before the reference year;

II. MONO-CULTURE INDUSTRIAL PLANTATION HAVE TO BE EXCLUDED FROM THE CDM

11. Mono-culture industrial plantations are industrial pulp and timber factories, but they are not forests, that can meet the multiple goals of the CDM. Mono-culture plantations can be defined as "*forest stands established by planting or/and seeding in the process of afforestation or reforestation, which are either: of introduced species (all planted stands); or intensively managed stands of indigenous species which meet all the following criteria: one or two species at plantation, even age class, regular spacing*"[3]

12. Mono-culture industrial plantations have to be excluded from the CDM, because they threaten the biological diversity, watershed protection, and local sustainable livelihoods. Furthermore they are likely to be non-additional, and particularly prone to be non-permanent (because, by definition, they are intended to be cut down, and because they are vulnerable to pest attacks, soil deterioration etc.). We do not believe that any of the accounting systems currently being proposed resolve the non-permanence issue of plantations, i.e. ensure that sink projects have the potential to deliver long term (i.e., several hundred years) sustainable carbon storage[4]. In this regard, we are concerned that the currently proposed accounting systems tend to shift the burden of greenhouse gas mitigation to future generations. Plantations also are likely to cause high leakage (due to the fluid international markets for pulp and timber, planting is reduced elsewhere). Thus, CAN does not believe that mono-culture industrial plantations can meet the necessary requirements for CDM afforestation and reforestation projects.

13. CAN believes that mono-culture industrial plantations might be effectively excluded by rigorous carbon accounting modalities to meet the agreed criteria of additionality, non-leakage, and permanence. However, given the threat that mono-culture plantations pose for environmental integrity, biodiversity, and sustainable development, Parties should seek to exclude these projects from the CDM in the clearest, most direct fashion possible.

14. CAN urges Parties to provide clear signals to the public and project developers that mono-culture industrial plantations will be excluded from the CDM. Such early signals are particularly important, given that many projects are already being planned and additional investment might occur over the next one to two years. In order to avoid sunken investments, investors and developers of sink CDM projects have to be informed that Parties will not accept mono-culture industrial plantations under the CDM. Clearly, NGOs, such as those organised within CAN, will take public action, if industrial mono-culture plantations were allowed to undermine the environmental and social integrity of the CDM.

[3] The Temperate and Boreal Forest Resources Assessment 2000. This categorical exclusion of mono-culture plantations is of utmost importance due to their specific problems, such as threatening biodiversity, increased risks for non-permanence due to reduced pest resilience, etc…

[4] see also paragraph 26.

CHAPTER 2 "DEFINITIONS"

III. DEFINITIONS

15. Whilst CAN has many serious reservations about the definitions, the majority of CAN groups considers that to re-open the text of a decision that Parties only agreed on in Marrakech would set an appalling precedent[5].

16. The Canadian proposal that wants to change the reforestation base year from 1990 to 1999 is clearly to be rejected, not only because it would reopen the definitions of reforestation, but also for environmental reasons. CAN urges Canada to withdraw its proposal. The following section A. illustrates why Canada's proposal is to be rejected.

A. No to "Canadian Proposal" of shifting the reforestation base year

17. A proposal to move forward the base year of the reforestation definition from 31 December 1989 (herewith 1990) to 31 December 1999 (herewith 2000) was tabled by Canada in the "sinks working group" at SBSTA 16. Canada argues that its proposal would create more opportunities for forest restoration activities and increase participation in the CDM by lesser developed countries. While CAN supports both these objectives, CAN is strongly opposed to Canada's proposal to change the reforestation base year as the method to achieve this.

18. In CAN's assessment, moving the base year forward to 2000 may well be counterproductive towards these aims. It has the potential to increase perverse incentives for deforestation, favour expansion of plantations over restoration, and fail to address the needs of lesser-developed countries to achieve effective and equitable participation.

19. CAN urges Canada to withdraw its proposal. The base year for the reforestation definitions should remain set at 1990 for the first commitment period. Shifting the base year forward for the first commitment period reduces the "buffer period" between deforestation and CDM eligibility, which may cause several problems in the first commitment period and beyond (see following three paragraphs 20 to 22)

20. **The Canadian proposal would create perverse incentives to clear/convert native forests, in order to make lands eligible for reforestation projects in future commitment periods**. This risk is manifest in two ways: (1) First, a change in the base year may create expectations that increase perverse incentives to deforest. A base year change to 2000 for the first commitment period may generate expectations among some landowners and managers as to likely outcomes of negotiations on the base year for future commitment periods. These expectations may prompt land managers to clear currently forested land that is ineligible for reforestation projects in the first commitment period in the expectation of making them eligible in the second commitment period. (2) Second, land use decisions in developing countries are often made under conditions of imperfect information. Some land managers, lacking accurate information on the eligibility requirements for CDM projects, may clear their lands with inaccurate expectations of making them eligible under the CDM. While this scenario can occur with the base year set at 1990 as well, the risk of inaccurate information may be greater if the base year changes.

[5] The definitions for "afforestation" and "reforestation" as given in Annex I of 11/CP.7 are already agreed to be applied to Article 12. Draft decision –/CMP.1 in 11/CP.7 reads: "Adopts the definitions, modalities, rules and guidelines relating to LULUCF under Articles 3, 6 and 12 … contained in the attached annex…"

21. **In the absence of sound rules limiting the eligibility of industrial monoculture plantations, the Canadian proposal would open up large areas of recently deforested land to plantation expansion.** Moving the base year forward increases in an absolute sense the eligible pool of lands for CDM sinks projects. For example, very large areas in Indonesia were burned in the 1990s for conversion to oil palm and pulp plantation interests. While such lands are also eligible for natural reforestation projects, in some countries existing incentives (e.g. subsidies) for plantation establishment coupled with carbon revenues under the CDM will create or enhance a competitive advantage relative to restoration projects. While the additionality criteria should be designed specifically to prevent these negative outcomes, only perfect development and application of these criteria would fully preclude an advantage to plantation establishment over restoration projects.

22. **Furthermore, the Canadian proposal would not take account of the fact that no credits are awarded for business-as-usual or non-action, and hence, natural regrowth is part of the baseline.** Credits can only be given for direct planting and management activities that would boost carbon stocks above baseline of natural regrowth rates. A shift in the base year from 1990 to 2000 is likely to increase the relative economic incentives to plant faster-growing (exotic) species on recently deforested areas, thus displacing their high natural regrowth potential and degrading biodiversity values.

23. Canada argues that the quality and availability of land use data under a 2000 base year is better than data for 1990, so a change to 2000 would allow greater participation in the CDM by lesser and least developed countries. In fact, CAN finds that the quality and availability of data for 2000 are not categorically better than those for 1990. For example, there are two global 1-km grid land cover datasets readily available for years around 1990 including lesser and least developed countries, as described in the literature[6]. (see, for example, http://glcf.umiacs.umd.edu). Historic fine grid data (30m) are not yet analyzed as a global dataset, but it is possible to analyze specific areas from LANDSAT and SPOT data "on demand". A more important limiting factor to balance participation in the CDM by developing countries, regardless of the base year chosen, is a lack of institutional capacity and resources to access, compile, and analyze existing land use data. CAN finds that appropriate capacity building and technology transfer are what is truly required to ensure full participation

[6] Some references regarding the readily available global landcover datasets:
a) Defries, R.S., A.S. Belward (2000) "Global and regional land cover characterization from satellite data: in introduction to the Special Issue", Int. J. Remote Sensing, Vol 21, No. 6&7, 1083-1092.
b) Hansen, M.C., R.S Defries, J.R.G. Townshend and R. Sohlberg (2000) "Global land cover classification at 1km spatial resolution using a classification tree approach" Int. J. Remote Sensing, Vol. 21, No. 6&7, pp. 1131-1364
c) Defries, R. S., M. C. Hansen, et al. (2000). "A new global 1-km dataset of percentage tree cover derived from remote sensing." Global Change Biology 6(2): 247-254.
d) Loveland, T.R., B.C. Reed, J.F. Brown, D.O. Ohlen, Z. Zhu, L.Yang, J.W. Merchant (2000) "Development of a global land cover characteristics database and IGBP DISCover from 1km AVHRR data" Int. J. Remote Sensing, 2000, Vol. 21., No 6&7, 1303-1330.

CHAPTER 3 "MODALITIES"

IV. NON-PERMANENCE / ACCOUNTING PROPOSALS

A. Background

24. Biological sinks are "reversible": that is, they can become net sources of carbon dioxide for a variety of natural and human-induced reasons, including climate change itself. However, in order to benefit the atmosphere, sequestered carbon must be stored forever, or, if it is released, it must be "bought back", either by truly additional[7] emission reductions or by further carbon sequestration that is equivalent to the release. It is thus essential that the rules for accounting for sink projects in the CDM are structured in a way that ensures that carbon either remains sequestered or that any releases to the atmosphere are made up for elsewhere.

25. The problem of non-permanence uniquely distinguishes biological sinks from energy sector projects, and therefore requires a unique solution. Among the currently tabled accounting proposals, CAN considers that a modified version of the Columbian proposal, often called Temporary CERs (T-CERs), that restricts the lifetime of credits to a five-year validity period, might be most appropriate.

26. However, an accounting scheme alone cannot address the permanence issue satisfactorily. Any acceptable accounting scheme requires rigorous monitoring and verification and full debits for potential re-emissions of sequestered carbon. In addition to the application of an appropriate accounting scheme, sinks projects must have the potential to deliver long term (i.e., several hundred years) sustainable carbon storage. A project can meet this criterion even if the project activities do not continue indefinitely, so long as the project implementation is such that it is intrinsically likely to maintain long-term carbon storage even if payments stop. Well-designed agroforestry CDM projects for poverty alleviation could also meet this criterion, because if farmers find them useful and of benefit, they will have developed the ecological capital that allows them to maintain these practices into the future. Forest restoration projects also have the potential to deliver long term (i.e. several hundred years) sustainable carbon storage. Short rotation, exotic species plantations, on the other hand, are unlikely to meet this criteria because of their unsustainable socio- and environmental impacts.

27. Carbon storage cannot be equivalent to a fossil emission reduction because it is not permanent. The T-CER approach relies on the notion that temporary carbon storage followed by a permanent emission reduction (technically, the retirement of an AAU) in the future would also be equivalent to a permanent emission reduction today. This is the best available option because it clearly assigns liability for the loss of carbon storage (i.e., impermanence). However, even this approach does not avoid the problem inherent to sinks that a liability is placed on the future. CAN is concerned that this future liability may cause serious problems, for example, spikes in demand for emission reductions (when T-CER's are retired and replacement units needed), weakening of future commitments, and ultimately a failure to actually make the promised additional and permanent emission reductions. The proposed rule to replace T-CERs if there is no subsequent commitment period in place, and the requirement for long-term sustainable projects, are both designed to complement the T-CERs.

[7] Note the importance of "truly additional" as laid out in Section V.

28. Furthermore, it must be stressed that although T-CERs provide a reasonable accountancy solution, this approach must be combined with satisfactory solutions for addressing additionality, leakage, uncertainties and socio-economic and environmental impacts, including on biodiversity and natural ecosystems.

B. The CAN position

29. In order to accurately reflect the change of atmospheric greenhouse gas concentrations due to afforestation and reforestation projects under the CDM, accounting rules for these projects should:

- ensure requirements for rigorous monitoring and verification;
- apply the principle of indefinite liability for accidental or intentional reversal of sequestered carbon.

In addition, the accounting rules have to provide strong incentives for long-term projects, and the sink projects design has to be such that sequestered carbon has the potential to be sequestered for a long-term and additional storage.

30. To achieve this end, CAN considers that – among the currently tabled accounting proposals - a modified version of the proposal tabled by Colombia (FCCC/SBSTA/2000/MISC8) might be most appropriate, often called Temporary CER (T-CER) approach, that restricts the credit lifetime to the length of one commitment period. In essence, the Colombian proposal states that CERs issued for sinks projects have a lifetime of about 30 years. At the end of a T-CER's lifetime it would expire and require replacement, either by an AAU, ERU, CER or a new T-CER.

31. The original Colombian proposal with its concept of temporary credits addresses one of the core concerns about accounting for permanence. However, a 30-year timescale is far too long because it would allow carbon loss to go undetected for long periods of time. The accounting approach should require more frequent verification that credited sinks remain intact.

32. A five-year lifetime with an opportunity for a Party to have the T-CER renewed or reissued[8] if the project continues to additionally store sequestered carbon, is more appropriate than other currently proposed accounting schemes. A five-year lifetime with an opportunity for renewal will provide an incentive to monitor and verify carbon storage continuously, or at least once in each commitment period. Five years with a renewal option also provides flexibility to developers and host countries, without requiring that land be "locked up" with long term contracts.

33. At the close of the five-year lifetime, the T-CER would expire and will need to be reissued or replaced. Reissue requires the re-certification of carbon stored at the project site for a subsequent and consecutive period. Alternatively, an expired LULUCF CER can be replaced with another valid LULUCF CER or with a non-LULUCF CER or an AAU.

34. This approach encourages the provision of continuous financial returns to project developers and local communities, thereby giving regular incentives for long-term carbon storage. It provides flexibility for investors and project developers to design longer-term contracts for T-CER generation. Also, the five-year T-CER approach is consistent with, and in some ways similar to, the Removal Unit (RMU) approach adopted for Article 6 LULUCF projects, i.e. they are of limited duration and, if they reverse, must be compensated for by additional removals or emission reductions.

[8] Technically, the CDM Executive Board would issue a new T-CER for ongoing carbon storage rather than reissue or renew an existing TCER that has expired. It is really the commitment by the project developer that is renewed, which results in the issuance of a new T-CER. This is because the registry cannot apply a single TCER toward compliance in more than one period; there must be a sequence of T-CERs with each one covering a specific 5-year period.

C. Some outstanding issues concerning T-CERs

35. Although the T-CER approach is likely to be a more appropriate accounting tool than other tabled proposals, several outstanding issues must be resolved, in order to ensure its effectiveness.

36. Provisions must allow for the exclusion of sinks in the second commitment period: If it turns out that the issues of additionality, leakage, non-permanence, uncertainties, socio-economic and environmental (biodiversity) impacts cannot be satisfactorily resolved, there mustn't be any new sink projects in the CDM for the 2nd CP. (Existing projects from first commitment period could be rolled over using the T-CER accounting mechanism, however.)

37. The proposal does not necessarily address potential perverse incentives for deforestation and short-term plantations. This is because the definitions and modalities for the inclusion of LULUCF activities included in Article 12 for the second and subsequent commitment periods have yet to be decided. In order to avoid creation of perverse incentives to deforest, definitions of afforestation and reforestation for the first commitment period include a requirement that the land was under non-forested land uses in 1990. If, however, the eligibility date for subsequent commitment periods were to be brought forward, the move would send a message that unscrupulous parties could plant a plantation, claim reforestation credits for it while clearcutting another forest, plant on that land after five years and claim more reforestation credits while clearcutting another forest, and so on. It is therefore of great importance that parties ensure, probably on the level of project approval screening criteria from the CDM EB, that these perverse incentives do not materialize.

38. As aforementioned, in addition to the application of an appropriate accounting scheme, sinks projects must have the potential to deliver long term (i.e., several hundred years) sustainable carbon storage. A project can meet this criterion even if the project activities do not continue indefinitely, so long as the project implementation is such that it is intrinsically likely to maintain long-term carbon storage even if payments stop. During project validation, a reasonable implementation and management plan must be demonstrated that guarantees that the project will lead to an additional, sustainable and potentially long-term carbon storage. In line with the provisions for RMU's, T-CERs shall only be applicable to meet commitments in the same commitment period, as the T-CERs are issued and thus the carbon storage verified.

39. If at the end of the first commitment period there is no subsequent commitment period in place under which T-CERs are recognized and which requires replacement upon expiration, then no T-CERs may be used for the purposes of compliance during the first commitment period.

D. Matters concerning accountancy, registries and crediting

40. When a T-CER that has been used to meet a commitment expires 5 years after issuance, an AAU will be subtracted from the current assigned amount of the Party that has used it. Thus, if an equivalent amount of additionally stored carbon can be verified again, the reduction of the assigned amount can be offset by a newly issued T-CER.

41. If it is verified that the project that gave rise to the original T-CER retains the original carbon, the T-CER may be reissued. A project may accrue additional T-CERs if additional carbon is verifiably sequestered. If carbon is released by the project, then only T-CERs equivalent to that carbon remaining stored should be re-issued. Similarly, if the sequestered carbon may no longer be verified then no T-CERs will be issued and previous T-CERs should be voided as appropriate.

42. There are considerable advantages in allowing long crediting periods for forest sinks. Short periods will tend to encourage plantations of fast growing monocultures whereas long periods will tend to encourage more ecologically sound forestry. A long crediting period would be achievable under this five-year T-CER approach with T-CERs being used sequentially. (Non-LULUCF projects can generate credits either for ten years or renewably twice for periods of seven years, i.e. up to a maximum of twenty one years.)

43. Two potential limitations on any accountancy approach are that a) the work of the IPCC is likely to significantly change forest definitions for the second commitment period and b) that sequestration may not be permitted in the CDM during and after the second commitment period. The five-year T-CER copes with either or both of these eventualities.

Inappropriate other accountancy proposals

"Equivalence based" accounting.

44. Equivalence based accounting (e.g. "tonne-year") is based upon the assumption that the sequestration and subsequent storage of carbon for a certain "equivalence" time (e.g. 46 or 100 years) would offset the same amount of emissions, whether or not the stored carbon were re-emitted after the "equivalence" time. In the original proposal, the project generates a flux of credits over time (yearly credits then equal average mass of stored carbon divided by the equivalence time in years).

45. The difficultly with this approach is that the scientific basis is incorrect. There is no finite "equivalence" time. Only additional sequestration and subsequent permanent storage can offset emissions.

The original "Colombian" proposal.

46. The original Colombian proposal (FCCC/SBSTA/2000/MISC8) tries to address non-permanence of sink projects by issuing "expiring" credits. These expiring credits have to be replaced by another credit after their "expiration" lifetime. The credit lifetime can, for example, be the envisaged project lifetime (e.g. 30 years). Although better than the "equivalence" based accounting schemes, the original Colombian proposal contains some flaws. In particular, the lifetime length is inappropriate. Projects should be monitored continuously, with CERs issued regularly, in order to incentivize land use decisions that most benefit the climate. Moreover, there is no inherent incentive structure, either for the investor country or the project developer, to monitor and verify the additional carbon stocks in the project once the credits have been given.

V. ADDITIONALITY

47. A key challenge to LULUCF project implementation under the CDM is verifying whether carbon sequestration resulting from project activities is truly *additional* to the baseline. This baseline must represent what would have happened anyway, without the project[9]. i.e. "the world without the project."

48. To the extent possible, the SBSTA should develop standardized approaches for developing LULUCF project baselines and for establishing carbon additionality. Methods that are reasonably simple, transparent, and reproducible are necessary to establish the credibility of LULUCF projects as well as to manage project costs and technical/data requirements.

49. Standard methods for baselines and additionality must strike a difficult balance between taking account of both national and regional trends and local and project-specific factors. The likely baseline scenario for LULUCF projects will depend on a mix of factors including legal and regulatory standards, commercial viability and trends, the range of current management practices, and development funding and financial investment flows. These factors are likely to be based on national and regional historic data and projections and should be incorporated in a systematic way into project assessment. Thus, in order to maximize consistency, all projects within a region or country might use the same national and regional data.

50. However, although analytical *approaches* and *methods* should be standardized, the *baselines* themselves clearly have to be individual project baselines. Again, these individual project baselines should ideally be simple. However, this is challenging for forest sinks projects, because of the number and diversity of factors to consider, such as soil type and condition, prevalent biomes types, climatic and ecological variability, as well as other project-specific geographic, ecological and socio-economic factors. A "one size fits all" type of standardised baseline is therefore not appropriate.

51. It is, however, vital that any baseline fully takes into account the fact that forest or other biomass will tend to grow back naturally. It is this natural regrowth that constitutes the baseline. Additionality can clearly only be claimed for anything in excess of natural regrowth, unless it can be clearly shown that the land would otherwise be used for a purpose where natural regrowth would be artificially prevented. (In this context, it is worth noting that intensively managed tree-plantations, once their economically useful life is completed, typically significantly reduce the subsequent natural regrowth capacity of the site.)

52. Modalities for sink CDM projects must provide a strong incentive for more sustainable national forest policies. One example would be to say that no project could proceed unless there was no net deforestation in the country concerned, together with socio-economic and environmental safeguards. Parties should explore ways through which the CDM can provide incentives for sustainable national forestry policies and practices.

[9] see Decision 17/CP.7, annex, paragraph 43

53. Furthermore, modalities regarding additionality have to take into account:

- the net balance of carbon dioxide, methane and nitrous oxide in order to set the baseline. Methane and nitrous oxide are high GWP gases, which in some cases may significantly affect the net climate effect of the project.

- not only the plant biomass carbon, but also soil organic carbon. In some wet areas, afforestation and reforestation may lead to significant losses of soil organic carbon, possibly offsetting the increase of plant biomass carbon. For example, Jackson et al. (2002) recently found that in certain grasslands of the south-western U.S., woody plant invasions into wetter grassland sites lost soil organic carbon, offsetting increases in plant biomass carbon, while drier sites gained carbon.[10]

- other uncertainties. See section VII.C on "Additionality and Uncertainties"

54. Baselines should be fixed for the first five-year commitment period, and then be regularly adjusted for each subsequent commitment period to reflect changing socio-economic, political, and ecological conditions[11]. Finally, baseline and additionality determinations should be independently certified before any credits can be given to the project.

VI. LEAKAGE

55. CDM projects do not operate in a vacuum. By changing practices to reduce emissions within the project boundary, projects have the potential to influence emissions outside their project boundaries. Higher off-site emissions can cancel some or all of the project benefits. This external effect is referred to as “leakage.”

56. Leakage can occur whenever a project displaces demand for land, timber, fuelwood, or other goods and services. Leakage can occur through many different mechanisms and across a range of geographic scopes from local to international. For example, a project’s use of land may displace local slash-and-burn-farmers or ranchers who will deforest other forest areas.

57. Commercial plantations are particularly prone to high leakage that occurs long distances from project site, because they sell into large, fluid markets Plantation projects will alter the supply of timber and pulp, causing other suppliers to national or international markets to change planting and harvesting decisions on lands elsewhere. The amount of leakage will depend on the origin of the replaced supply and the associated changes in land management, which will be hard to trace given the fluctuations and geographic scope of many markets. Commercial plantation projects should be excluded from the CDM because of their potential for high and geographically-distant leakage that is hard to estimate, unless methodologies are applied that can be proven to fully adjust for leakage.

58. Leakage has the potential to entirely reverse the climate benefits of a project if the underlying demand for land, timber, pulp etc. remains unchanged and emissions-producing activity occurs elsewhere instead. The potential for 100 percent loss of carbon benefits requires that

[10] Furthermore, according to this recent study in North America, "such shifts make carbon stocks more vulnerable to loss from fire, biomass harvesting, and other disturbances." : Jackson, R.B. et al. (2002) "Ecosystem carbon loss with woody plant inversion of grasslands", Nature, Vol. 418, 8. August, p. 623.

[11] pursuant to decisions by the CoP regarding the treatment of LULUCF projects in subsequent commitment periods.

rigorous methodologies are implemented to adjust for leakage. Given the narrow definition of project boundary under paragraph 52, which includes only emissions sources under the direct "control of the project participants,"[12] it is vital that the definition of leakage in paragraph 51 is interpreted broadly. Specifically, the terms "measurable and attributable the CDM project activity" in paragraph 51 should include market leakage and potential leakage at all scales – local, national, and international.

59. There are no simple solutions to leakage and this is recognized as an area of project assessment that requires significant development. SBSTA should develop methodologies that are appropriate for specific project types and all types of leakage. Leakage methodologies should be transparent, consistent and objective.

60. CAN believes that leakage is best addressed by combining two complementary approaches: (1) selecting the project assessment boundary and methods to capture geographically proximate leakage, and (2) estimating leakage that occurs outside the reasonable range of direct measurement. This recognizes the fact that some leakage may be estimated by monitoring flows across well defined boundaries, while other leakage effects may be indirect, influencing remote locations socio-economically or environmentally in ways that are unpredictable from direct monitoring of carbon flows (for example, through investment crowding, supply displacement, demand displacement and activity displacement). Leakage that cannot be directly measured at the local level should be estimated using appropriate models of land use, production and markets.

61. SBSTA shall develop definitions and modalities for afforestation and reforestation projects that address leakage that will:

(a) Distinguish the types and magnitude of leakage that may occur from different project types;
(b) Identify methods for estimating and accounting for leakage that are appropriate for specific project types and types of leakage;
(c) Require reasonable project design elements and eligibility requirements to avoid leakage;
(d) Define project boundary requirements such that direct project monitoring takes into account geographically proximate leakage;
(e) Develop standard methodologies to account for unmitigated leakage occurring outside the project boundary, including leakage that may occur beyond national borders.

VII. UNCERTAINTIES

A. General

62. Estimates of the climate benefits of project-based activities are subject to two main types of uncertainties: in measurement of emissions and in delineating project-related parameters. Measurement uncertainty occurs because of the unavoidable limitations of even the best estimates of carbon stocks or emissions of greenhouse gases. This is, in part, due to the fact that emissions and removals of greenhouse gases are almost never directly measured, for reasons of both practicality and cost. They are estimated from so-called activity data which are multiplied by emission factors[13]. Both activity data and emission factors are generally more accurate for fossil fuel burning than they are for LULUCF activities, in part because such data has long been collected for economic reasons (for example, taxation) and partly because the well-defined, comparatively constantly emitting, point sources typical of fossil fuel burning are intrinsically easier to estimate

[12] (Annex of -/CMP.1 of 17/CP.7 in FCCC/CP/2001/13/Add.2)

[13] For example, emissions from trucks would be estimated from activity data on their numbers, engine sizes, distances travelled and emission factors on emissions per unit fuel consumed.

than the less well characterized, fluctuating and diffuse sources that constitute most sinks. This was, to a significant extent, the reason why the Kyoto Protocol focuses on changes in carbon stocks rather than emissions from forests. Nevertheless, it is also hard to estimate carbon stocks accurately. There is thus a need for a means of coping with uncertainty in LULUCF projects, in general, and in forest-related projects, in particular.

63. Delineating project-related parameters, such as additionality, baselines, and leakage are necessarily subjective and introduce significant uncertainties unique to evaluating project-based activities. This section focuses mainly on ways of reducing, or allowing for, measurement uncertainty. It also briefly examines some issues relating to uncertainties in assessing additionality (specifically baselines). Other types of uncertainty or risk are addressed elsewhere in this paper, related to non-permanence and the inability to generate intended social and non-climate environmental goals.)

64. CAN believes that there are three steps to handling uncertainty.

- Step 1: Measurement Uncertainty. Apply good practice guidelines for estimation of carbon stocks and GHG emissions;
- Step 2: Apply strong rules for permanence, additionality, leakage and other project elements;
- Step 3: Adjust (or "discount") the resulting estimates of project benefits to reflect the level of residual uncertainty before issuing CERs.

65. The first two steps can help to avoid unacceptable levels of uncertainty. Good practice guidelines for measurement are being developed as part of IPCC's ongoing work. Issues related to strong rules are addressed in other sections of this paper. Therefore, we focus first on the third step, how to adjust for measurement uncertainty.

B. Step 1: Measurement uncertainty

66. Adjusting project estimates to reflect residual uncertainty is critical to ensure that there is equal *confidence* that each CER represents the same climate benefit. Any reasonable application of Steps 1 and 2 above will result in estimates with uncertainties that will vary from project to project. This is not an acceptable basis upon which to issue CERs. Rather, the number of CERs issued for a project should reflect the lower end of an appropriate statistical confidence level.

67. Scientific convention is frequently to report values at the 95 percent confidence level, and this may be a reasonable approach in this case. Applied to the CDM sinks framework, this means that no carbon is credited which is not at least 95% certain to have been additionally sequestered (see Figure 1). Additional methodological work would be necessary to implement this principle, but the concept is straightforward and similar approaches have in fact been used in many pilot projects.

68. The practical implication of Step 3 is that projects with higher residual uncertainty have their estimates "discounted" relative to projects with lower uncertainty. Note that, reaching a given level of confidence across projects is not the same as requiring that all project estimates achieve the same level of uncertainty. One can accept a higher level of uncertainty from some projects as long as the project estimate is discounted to reflect that uncertainty before issuing CERs.

69. The discounting of project estimates based on uncertainty has several important attributes. First, it protects the integrity of the CDM by preventing CERs with wildly different levels of

uncertainty to enter into the market.[14] Second, it offers considerable flexibility to project developers who can determine for themselves the cost-effective level of monitoring, trading off the cost of additional assessment versus the potential to certify more CERs. Third, it is fair, because projects with greater uncertainty will bear more costs than other projects.

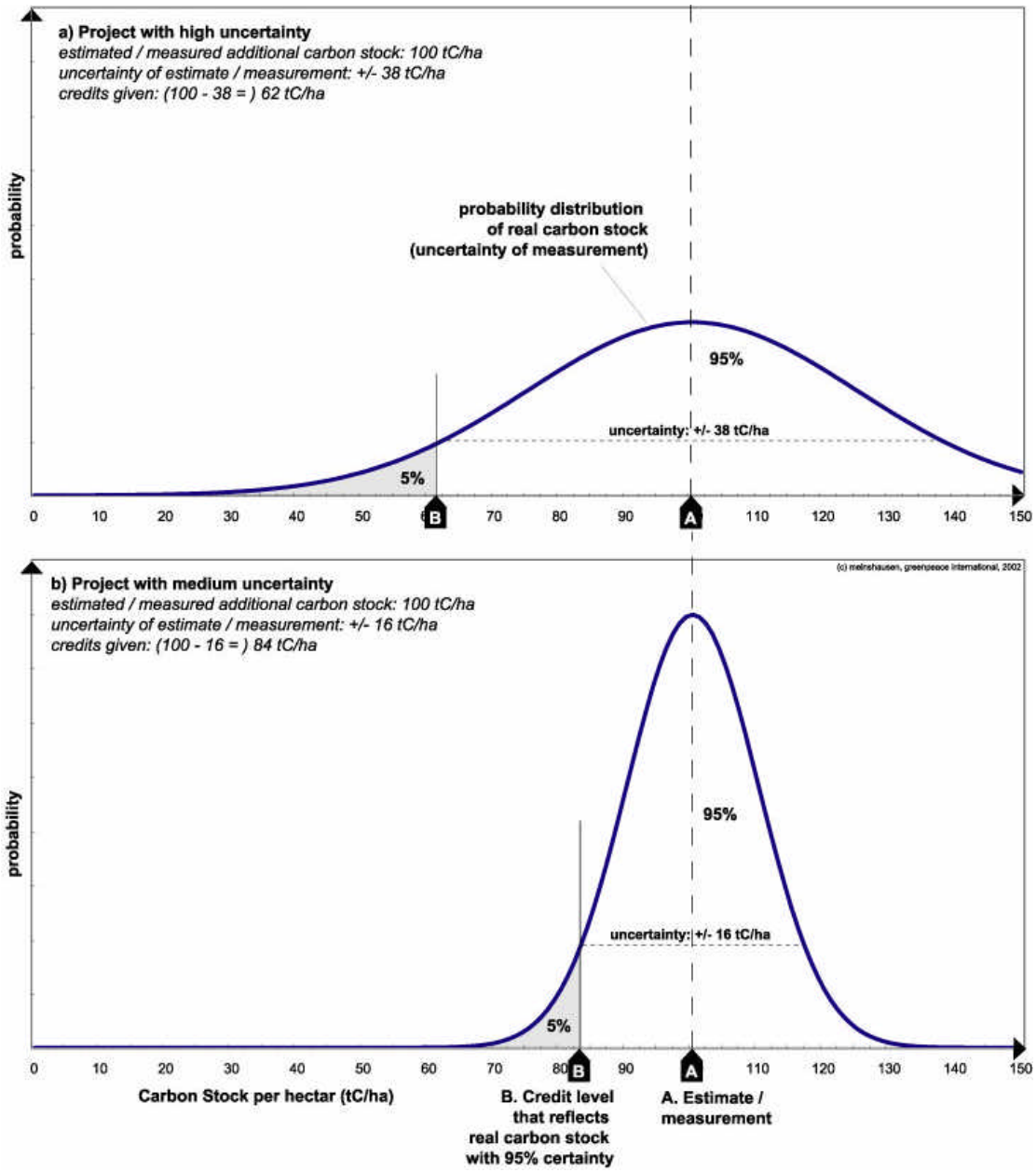

Figure 1 - Discounting for Uncertainty. The task is to guarantee conservative estimates of the real carbon stock. One has to ensure that given credits reflect the real carbon stock with at least 95% certainty. Thus, the credits have to equal the lower bound of the uncertainty (B), here illustrated schematically for projects with high (upper figure) and medium uncertainty (lower figure). This illustrates that it is important to decide rigorous procedures to determine uncertainty of sink project carbon estimates (or in other words: to determine the probability distributions)

[14] The discounted CERs have the same of level of uncertainty, even though the underlying project estimates have different uncertainties.

70. Alternative approaches to addressing uncertainty that avoid the discounting described in Step 3 all introduce significant problems. Requiring a set level of certainty will essentially make some project types ineligible, either because assessment methods do not exist or are prohibitively expensive. Specifying exact methods will remove flexibility for developers, and are also likely to be determined by what is possible not by what is necessary to maintain the integrity of the CDM.

71. This paper addresses issues identified in the request for August 20, 2002 submissions, which focuses on afforestation and reforestation projects. However, it should be noted that rigorous procedures to handle uncertainty should be applied even-handedly to all project types to promote consistency and integrity in the CDM.

72. In conclusion, it should be recognized that it is not always possible to reliably assess uncertainty. Where there are many direct measurements on which to base an estimate, then it can be reliably estimated statistically. However, some estimates are simple experts' "best guesses" and are not amenable to statistical treatment. A conservative default discount rate should thus be provided for particular types of project, probably in the forthcoming IPCC Good Practice Guidelines.

C. Additionality and baselines

73. A key area of uncertainty in any project is that which can be introduced by estimation of the baseline from which it is measured. Indeed, because additionality means additional to what would have happened anyway, and it is never possible to be completely confident of what would have happened (but has not), additionality is a fundamentally intractable problem, in theory at least.

74. In practice, uncertainty can be minimized. For afforestation and reforestation projects, this would entail work on estimating carbon uptake were the land use on the site in question to continue or take a path typical for the area. For example, what would be the carbon uptake (or release) if a particular agricultural practice were to continue, or what would be the rate of uptake if the area were abandoned to regrow its natural vegetation? These estimates would then constitute the baseline, which would almost certainly change over time (i.e. it would be a so-called dynamic baseline).

75. Following the first two steps, mentioned earlier, the third step would help reduce uncertainty on baselines, although they would probably not completely remove it. In addition, baseline estimates should be regularly reviewed and adjusted over time. (Nearly all AIJ projects required baseline adjustments.) Review and adjustment could take place at the same time as TCER eligibility is reviewed (see section IV on permanence).

VIII. SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACTS, INCLUDING IMPACTS ON BIODIVERSITY AND NATURAL ECOSYSTEMS

76. Parties have a responsibility to adhere to the agreed principles governing LULUCF projects. When dealing with social and environmental issues, the most starkly relevant principle is that LULUCF projects."…contribute to the conservation of biological diversity and sustainable use of natural resources". Thus, Parties need to determine methods by which they can ensure that they are indeed adhering to this agreed principle, as well as the underlying mandate that Article 12 CDM projects contribute to sustainable development of host countries.

77. CAN believes that such methods must be consistent for all projects, and all Parties (host countries and project proponents). A consistent, transparent and common methodology is the most simple and basic tool that the Executive Board operational entities must use to measure biodiversity

and sustainable use impacts, both positive and negative, of the CDM on a global scale. Critical to note is that such tools exist already, and Parties have already agreed to accept these tools regardless of national circumstances. These will be presented below.

78. The international nature of the CDM should not allow countries to solely apply national laws, regulations and enforcement procedures when undertaking CDM LULUCF projects. The argument put forth by some Parties that applying international standards and guidelines conflicts with national sovereignty is simply a way to avoid being held to a common, transparent and international standard, and thus could challenge global accountability for project quality. Such an approach fails to recognize the unique nature of the CDM as a mechanism, agreed by Parties, to attain sustainable development objectives and climate benefits on a global scale. The Kyoto Protocol, and its Framework Convention, are international in nature, and bind the Parties to specific desired outcomes. Thus, permitting Parties to solely apply national law and regulations for global objectives should not be accepted. This is true of other international environmental agreements with specific binding outcomes, such as CITES, International Whaling Commission agreements, and others. In addition, CERs are internationally tradable commodities, and could thus be subject to trading regulations promulgated by the World Trade Association (WTO).

79. Allowing countries to depend solely on national environmental and social laws and regulations is potentially discriminatory, and could potentially subject Parties to violations of international law. Two scenarios present this potential.

80. In the first scenario, host country X has impeccable environmental credentials. Based on Country X's national law and regulation, CDM projects would be subject to environmental and social assessment processes consistent with other environmental projects, and would be designed to adhere to the principles of the Marrakech Accords and the Framework Convention. Country X legally recognizes and respects indigenous and traditional land tenure regimes, and would ensure that CDM projects are done in accordance with relevant laws, and in accordance with the definitions and modalities agreed at COP9. With this framework in place, Country X could either attract ample CDM investments because its national laws and regulations give investors a high degree of confidence that their projects will not be subject to international scrutiny and potentially negative public relations impacts from civil society (i.e. CDM/SinksWatch[15]). This would discriminate against countries with less stringent and transparent legal, regulatory frameworks in place. Alternatively, Country X may be at the losing end of CDM investment, because investors could perceive that CDM projects would be too costly. Country X affectively discriminates against itself, which could provide inventive to weaken or ignore its own legal framework.

81. In the second scenario, Country Y has weak and/or non-enforced environmental laws, rampant corruption, illegal logging problems and unclear land tenure policies, which have resulted in ample deforested lands for CDM projects. Given this framework, investors may find CDM very attractive, as they can establish large-scale monoculture exotic plantations with less perceived investment than in Country X. This scenario discriminates against Country X, puts at risk remaining biological diversity, and exacerbates social tensions among the rural poor in Country Y.

82. While both scenarios are hypothetical, they are grounded within the range of possibility. The point is that without a common framework and standards for project design, some countries will attract more investment than others, and the CDM will not be equitable and will not contribute to sustainable development. Ironically, as the scenarios illustrate, this could be for positive or negative reasons.

[15] see www.cdmwatch.org and www.sinkswatch.org, which will be online until the end of 2002.

83. As stated, agreed standards already exist as a baseline for project development under the framework of the UN system, other Multilateral Environmental Agreements (MEAs) such as CBD and CCD, and the binding guidelines of the World Bank in particular. CAN recognizes that these processes have weaknesses and gaps, for example the CBD and CCD have yet to deliver binding commitments, and some CAN members advocate against the World Bank's environmental policies and procedures as being inadequate in some cases. However, the rules and research of these MEAs and multi-lateral institutions do provide baselines for the development of social and environmental assessments. All Parties are members of the UN, and most are members of the World Bank as either donors or borrowers, and thus already accept the World Bank procedures for environmental and social impacts. While imperfect, these existing mechanisms provide a point of departure that can allow for comparative and transparent evaluation of projects by Operational Entities, the Executive Board, project stakeholder and civil society.

84. All CDM LULUCF projects must be evaluated against one consistent and transparent set of guidelines. The guidelines need to include processes and tools to evaluate social and environmental impacts, with binding impact mitigation procedures or other consequences, such as denial of registration, if projects fail to meet minimum standards. The project development and monitoring cycle must involve procedures for gathering relevant information and evaluating projects, including mechanisms for effective stakeholder input at the project's conceptual stage, and at regular intervals throughout the project design and implementation cycles.

85. Furthermore, land rights have to be considered. What the Protocol refers to as sinks are often homes to some people, whose communities, livelihoods and cultures could be undermined by LULUCF activities. The land rights of many indigenous peoples, especially forest people, have frequently been usurped or grossly infringed in the past. A concern is that by ascribing a carbon value to new forests, the land rights of indigenous people may again be forfeited.

86. Project experience prior to the Marrakech Accords illustrates that the lack of common and transparent social and environmental assessment guidelines can promote a race to the bottom for some investors seeking cheap credits through minimal design processes. These losses should be unacceptable, especially as they are potentially avoidable.

87. To address socio-economic and environmental issues SBSTA shall develop definitions and modalities, supported by standards and guidelines, for afforestation and reforestation projects that will:

(a) Be fully consistent with local and national environmental laws and policies, with World Bank operational policy relating to environmental and social impacts of projects, and consistent with the goals and objectives of other Multilateral Environmental Agreements (MEA) such as the Convention on Biological Diversity (CBD) (with a joint work program in place), the Convention to Combat Desertification (CCD); and the RAMSAR Convention on Wetlands.

(b) Require that Parties publish and effectively disseminate national rules or guidelines on environmental and social sustainability of projects, consistent with relevant national law, the modalities and procedures established for the CDM, relevant World Bank operational policies, and that are consistent with relevant MEAs for a participant country, prior to participation in CDM project activities of that Party or of entities resident in or operating under the jurisdiction of that Party;

(c) Develop a mandatory process for environmental and social impact assessments based on (a) (b), above, and (e) below.

(d) Require that each project activity has undergone a mandatory and participatory project design process prior to its registration. Such a process shall, at a minimum:

i. Determine whether project activities will be consistent with the criteria set forth in the Marrakech Accords and with any additional criteria or guidance adopted by the Conference of the Parties or the Executive Board;

ii. Require a social and environmental impact assessment to assist project developers identify and mitigate any potentially negative impacts and enhance potential environmental or social benefits. Rather than being a constraint to project developers such assessments can help design projects that minimize risk to both investors, host countries and local stakeholders.

iii. The impact assessment process has to ensure that information necessary to assess the environmental and socio-economic impacts of each project is made available to all stakeholders in a timely and culturally appropriate manner.

iv. Ensure meaningful and transparent stakeholder participation during each phase of the project cycle (project proposal, validation, registration, verification and certification, and issuance of CERs), including opportunities to contribute to all phases of the project development and design, review and comment upon relevant documents within a 60 day time frame, and to receive responses as to why stakeholder input was incorporated or rejected in project design[16];

v. Contain specific strategies and plans to mitigate any negative environmental or social impacts of the project, and to reject a project if mitigation proposals are inadequate to ensure the conservation of biodiversity and the sustainable use of natural resources;

vi. Be subject to review by the Operational Entity and/or Executive Board at any time during the life of the project.

vii. Ensure that the consistency of the project with all requirements listed under (e) below can be assessed prior to the project's registration.

(e) Require that CDM projects:

i. Are afforestation and reforestation projects that promote ecosystem restoration with native species to maximize environmental benefits, such as watershed enhancement, biodiversity and social benefits, such as poverty alleviation and sustainable livelihoods with the agreement and participation of local communities;

ii. Are subject to a meaningful and transparent stakeholder participation during each phase of the project cycle (project proposal, validation, registration, verification and certification, and issuance of CERs), including opportunities to contribute to all phases of the project development and design, review and comment upon relevant documents within a 60 day time frame, and to receive responses as to why stakeholder input was incorporated or rejected in project design;

[16] for more on public participation in the CDM, see "Key Opportunities to Strengthen Public Participation in the CDM" Nathalie Eddy, Greenpeace USA, SB16 Briefing paper, available at http://www.climnet.org/sbsta16/GPsb16-cdmpubpart.pdf

iii. Clearly demonstrate ancillary environmental benefits, including protection of biodiversity, soil and freshwater conservation, combating desertification, and improvement of air and water quality;

iv. Not contain any plantations, defined as *"forest stands established by planting or/and seeding in the process of afforestation or reforestation, which are either: of introduced species (all planted stands); or intensively managed stands of indigenous species which meet all the following criteria: one or two species at plantation, even age class, regular spacing"*[17].

v. Where applicable, promote protection of sensitive species and ecosystems, such as those listed under CITES and the IUCN Red Book.

vi. Clearly demonstrate ancillary social benefits, including the generation of local income, the promotion of secure land tenure and capacity building;

vii. Not contribute to the risk of desertification or soil erosion on affected or adjacent lands, or reduce the quantity or quality of fresh water resources;

viii. Respect and build upon the rights and needs of Indigenous People and local communities, including customary rights related to land tenure and the right of indigenous peoples to prior informed consent over projects that affect them and their lands. This requirement should be clearly reflected in the definitions, modalities and safeguards for assessment and monitoring of afforestation and reforestation projects in the CDM.

ix. Ensure sustainable forest practices, such as those carried out by many local communities as well as those prescribed under creditable independent certification processes. Exclude the use of harmful forestry practices, such as forest simplification, intensive soil disturbance, extensive application of pesticides, herbicides or other chemicals.

x. Not involve displacement of local communities or indigenous peoples;

xi. Exclude the conversion of, or negative impacts to, native ecosystems, including all native forests, inclusive of old growth and late successional forest areas, wetlands, grasslands or deserts. In ecosystems that have human communities, exclude areas where land tenure is in dispute and activities that have negative impacts on those communities and their livelihoods.

xii. Exclude the use of genetically modified trees or other organisms, and the introduction or use of exotic species;

xiii. Exclude the use of pesticides whose use or transport is prohibited under multilateral environmental agreements, or the laws of the participating countries;

[17] The Temperate and Boreal Forest Resources Assessment 2000. This categorical exclusion of mono-culture plantations is of utmost importance due to their specific problems, such as threatening biodiversity, increased risks for non-permanence due to reduced pest resilience, etc..

xiv. Not alter natural or traditional indigenous fire regimes, except where essential for initial site preparation prior to reforestation. Especially not alter fire regimes, where they are an integral part of the ecosystem, and exclude fire suppression to obtain carbon credits in these areas.

(f) guarantee that approval or disapproval of a project (registration) is based on the results of the mandatory environmental and social impact assessment, described under (c) and (d) above.

(g) Solicit and incorporate input and guidance from the Convention on Biological Diversity, the United Nations High Commissioner for Human Rights, and other intergovernmental organizations with relevant expertise;

(h) Monitor projects periodically to verify compliance with paragraphs (a)-(e). Projects that are not in compliance with paragraphs (a)-(e) shall not be issued CERs.

IX. MISCELLANEOUS

A. Dispute Resolution

88. Given the high socio-economic and ecological complexities of land use, the importance of land to directly meeting the subsistence needs of billions of persons around the globe, and the greater complexities of assessing realistic baselines in the land-use sector, Parties will want to ensure that the CDM provides additional procedural safeguards for LULUCF projects. In cases where the CDM inadvertently approves projects that worsen poverty by reducing access to land and other resources, lead to environmental degradation in the areas where they are implemented, and/or are based on fundamentally flawed baseline, additionality or leakage assumptions, affected stakeholders should have recourse to a CDM LULUCF Dispute Resolution mechanism in order to have an opportunity to resolve such problems effectively.

B. Wood Products

89. Finally, a remark about wood products. CAN opposes any ideas to award credits for carbon storage in wood products. Not only is carbon storage in wood products, and its related leakage and its additionality impossible to monitor and verify, accounting for the carbon storage in wood products does as well divert financial and political resources away from the primary task to reduce societies' dependence of fossil fuels. Thus, CAN supports the IPCC's reporting guideline default assumption that harvested wood is assumed to be oxidised into carbon dioxide when trees are cut.

X. CONTACT

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XI. APPENDIX A: WHO IS "CAN" ?

90. The Climate Action Network (CAN) is a global network of about 300 Non- Governmental Organizations (NGOs) working to promote government and individual action to limit human-induced climate change to ecologically sustainable levels. CAN members work to achieve this goal through the coordination of information exchange and NGO strategy on international, regional and national climate issues. CAN has seven regional offices which co-ordinate these efforts in Africa, Central and Eastern Europe, Europe, Latin America, North America, South Asia, and Southeast Asia. Diverse environmental organizations from around the globe, ranging from large international groups such as World Wildlife Fund (WWF), Greenpeace, Friends of the Earth, to small local groups in developing countries such as Terre Vivante in Mauritania and the Green Coalition in the Philippines, work collaboratively within CAN.

91. For more information about CAN, please visit www.climatenetwork.org and www.climnet.org.

PAPER NO. 4: GREENPEACE

GREENPEACE

SUBMISSION BY GREENPEACE[1]
ON ISSUES RELATED TO MODALITIES
FOR INCLUDING AFFORESTATION AND REFORESTATION
UNDER ARTICLE 12.
NON-PERMANENCE OF SINKS
20th August 2002

ABSTRACT

- The relative effectiveness of proposals to address non-permanence of afforestation and reforestation projects under the CDM and related accounting is discussed. This paper complements a separate Climate Action Network (CAN) submission, that deals with equally important issues such as leakage, impacts on biodiversity, socio-economic impacts, uncertainties, and other key problems. Greenpeace contributed to and fully supports the CAN submission.
- There are three main accounting proposals on the table,
    1. the class of "equivalence-time" based accounting proposals,
    2. the original Colombian proposal, and
    3. The so-called "T-CER_5" approach.
- None of the accounting proposals fully resolves the issue of non-permanence, since non-permanence is an inherent feature of sinks (which cannot be resolved by any accounting proposal). At the best, accounting schemes can only partly ameliorate the non-permanence problem, some better than others.
- The "equivalence" based approaches (1) and the original Colombian proposal (2) fail to significantly ameliorate the non-permanence problem and should be rejected.
- The modified Colombian proposal "T-CER_5" with a credit validity time of one commitment period, instead of 30 years, (3) overcomes the principal shortcomings of the other proposals.
- In addition to an accounting scheme, a project screening requirement must rule out short-term unsustainable projects in order to address non-permanence (i.e. industrial mono-culture plantations have to be excluded),

[1] Greenpeace International, Keizersgracht 176, 1016 DW Amsterdam, The Netherlands, see www.greenpeace.org.

PREAMBLE

Parties and other organisations have been invited to present their views on the issues related to modalities for including afforestation and reforestation under the CDM. Greenpeace International welcomes this opportunity to submit its views and concerns to the UNFCCC Secretariat for distribution to policy makers.

CONTENTS

I. INTRODUCTION: SINKS ARE NOT THE SOLUTION

1. Greenpeace continues to believe that the inclusion of sinks under the Kyoto Protocol and under the CDM is fundamentally flawed. Accounting for sinks under the terms of the Kyoto Protocol is not an effective way to tackle the pressing problem of long-term climate change. A drastic and immediate reduction of our fossil fuel related greenhouse gas emissions is urgently needed. The use of sinks projects only diverts political and financial resources away from this enormous and urgent task. Thus, Greenpeace strongly encourages countries to meet their obligations under the Kyoto Protocol without using sinks, no matter whether in Annex B countries (Art. 3.4/Art. 6) or in Non-Annex B countries (Art. 12)[2].

2. Nevertheless, given that parties have agreed to make some CDM sink activities potentially eligible for projects for the first commitment period, it is important that substantial weight is given to Article 12.5(b) of the Kyoto Protocol, which requires that these projects provide "Real, measurable, and long-term benefits related to the mitigation of climate change".

3. Accounting for afforestation and reforestation under the CDM has only been allowed, on the binding condition that such projects meet a number of crucially important requirements. Specifically, CDM sink modalities must exclude any projects that are: non-additional; harm biodiversity or natural ecosystems; have negative socio-economic or environmental impacts; are designed to be only short-term; cause high negative leakage; are subject to high uncertainties; and/or do not follow the principles laid out in the preamble of decision -/CMP.1 (11/CP.7- land use, land-use change and forestry[3]). Accounting rules have to assure that uncertainty, leakage and non-permanence are adequately addressed for all eligible projects.

4. In Greenpeace's view, no new sink projects should be allowed in the second commitment period. This is particularly urgent if sink projects prove unable to meet the crucially important requirements as listed in para 3. Alternatively, parties may fail to design adequate modalities or those modalities will not be adequately enforced. In both cases, the "first commitment period only" experiment of sinks in the CDM should clearly not be prolonged. Thus, any adopted accounting scheme has to provide the opportunity for the Kyoto Protocol to be designed "CDM sink free" in the second and subsequent commitment periods.

5. Mono-culture industrial tree plantations have clearly to be excluded from CDM project eligibility.

[2] In this regard, it should be noted that halting deforestation and supporting sustainable forest management are major campaigns of Greenpeace (see www.greenpeace.org > campaigns > forests).

[3] see (FCCC/CP/2001/13/Add.1, page 56)

II. WHY IS NON-PERMANENCE A PROBLEM?

6. It is often suggested that establishing forests or deferring deforestation for some period of time would be an effective tool to address climate change and should therefore be accounted under the Kyoto Protocol. This is often based on the assumption that temporary (non-permanent) carbon storage lowers temperature-levels and climate-damages "at each point in time" in the future.

7. Unfortunately, this assumption is wrong, since it does not take account of the carbon cycle. Although causing climatic benefits in the near term, temporary carbon storage will - in the long term - increase CO_2 concentrations and temperature-levels. Consequently, higher climate change related damages could be expected in the future (see *Figure 1*)[4].

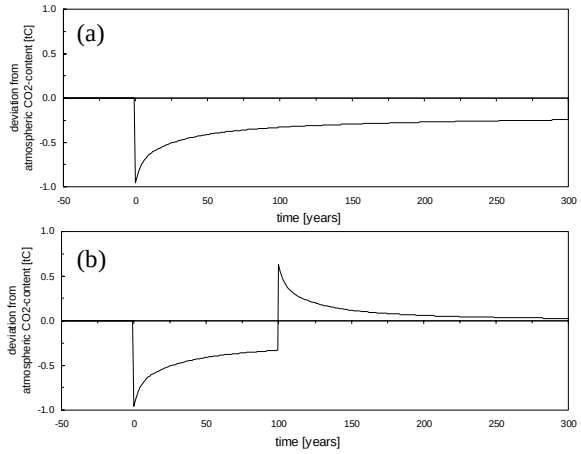

Figure 1

(a) Change in atmospheric CO_2-content due to a CO_2 emission reduction or permanent carbon storage

(b) Change in atmospheric CO_2 content due to temporary carbon storage of 100 years.

8. Even if any re-emissions of sequestered carbon will be fully accounted for in the future, the inherent problem of the non-permanence of sinks is not solved. This is due to several reasons:

- The obligation to reduce emissions is simply delayed into the future, increasing the burden of mitigation for future generations.
- Since future emission reduction targets are not yet set, parties might be unwilling to negotiate deep emission reductions in anticipation of debited re-emissions of former sink projects.
- Furthermore, the urgently needed incentives for innovation and dissemination of technological and social innovations for energy saving will be reduced. If we reduce this early action in the energy sector, we forgo much needed time to increase our ability for much more drastic emission cuts in the future. Learning by doing is the only viable way to develop and disseminate emission reducing technologies and behaviours in due time.

9. Simply stated, only permanent, additional carbon storage is equivalent to a reduced emission[5]. Sometimes, it is even suggested that a temporary carbon storage followed by a permanent

[4] see e.g. Greenpeace background paper, Meinshausen, M. and Hare, B. (2002) "Temporary sinks do not cause permanent climatic benefits", available online at www.greenpeace.org > campaigns > climate > documents

[5] It is important to note that this notion "only a permanent, additional carbon storage is equivalent to a reduced emission" does not take account of the important "learning by doing" effect of emission reductions. See last bullet point of paragraph 8.

emission reduction in the future or another carbon sequestration would as well be equivalent to a permanent emission reduction today. This is – theoretically – correct. However, in practice, the future emission reduction will have to be done by future generations, which will face much more stringent emission reduction targets than ourselves anyway. Thus, whether the future emission reduction will be truly additional, thereby offsetting the re-emission of sequestered carbon is highly questionable.

III. CRITERIA TO ASSESS NON-PERMANENCE POLICIES

10. Acceptable modalities and accounting proposals for addressing non-permanence must meet certain basic criteria. Among these:
Does the accounting scheme…

- fully account for any re-emission of carbon, regardless of the cause for the re-emission (see Box 1 below)?
- provide strong incentives for buyer's and project developers for periodical monitoring of carbon stocks?
- provide ongoing incentives for maintaining the carbon stock in the long-term?
- provide the option for a "CDM sink-free" Kyoto Protocol in future commitment periods?

If the answer to any of these questions is negative then the accounting proposal is clearly inappropriate for sinks under the CDM.

11. In addition to the application of an appropriate accounting scheme, only those sink projects that have the potential to deliver long term (i.e., several hundred years) sustainable carbon storage must be eligible[6].

12. Of course, the full requirements for appropriate modalities go far beyond non-permanence. Baseline definitions, biodiversity issues, socio-economic impacts, perverse incentives for deforestation, leakage effects and uncertainty are among other crucial issues that have to be addressed. These are further discussed in the CAN submission.

[6] For more on this, see paragraphs 26, 27 and 28 of the complementing Climate Action Network (CAN) submission.

Box 1: Extract from the IPCC Special Report on LULUCF:

"Enhancement of carbon stocks resulting from land use, land-use change, and forestry activities is potentially reversible through human activities, disturbances, or environmental change, including climate change. This potential reversibility is a characteristic feature of LULUCF activities in contrast to activities in other sectors. This potential reversibility and non-permanence of stocks may require attention with respect to accounting, for example, by ensuring that any credit for enhanced carbon stocks is balanced by accounting for any subsequent reductions in those carbon stocks, regardless of the cause."

[IPCC SP LULUCF, Summary for Policymakers, paragraph 40]. See as well other relevant sections of IPCC SP LULUCF, such as paragraphs 78 to 82 of Summary for Policymakers.

IV. EVALUATION OF ACCOUNTING PROPOSALS

A. Illustrations: The basic idea

13. The following simplified illustrations highlight the concepts behind different accounting proposals for sinks under the CDM. Clearly, the illustrations do not capture the technical details at the registry level. For example, the sub-components of the national registry, the holding, retirement and cancellation account are not displayed separately (see fig 2).

14. Roughly speaking, the sum of the holding and the retirement account of an Annex B Party is symbolised by the right scale of the balances "Allowances". The left scale of the balances, "Emissions", illustrates the actual domestic emissions of an Annex B Party. A Party is in compliance with the Kyoto Protocol, if it holds at least as much emission allowances as it causes emissions (upper scale indicator vertical or leant to the right).

15. In general, a Party comes into compliance with the Kyoto Protocol, if it reduces domestic emissions (*Figure 2*) in order to bring emissions and emission allowances into balance. Accounting for sinks under the CDM is another possibility to comply with the Kyoto Protocols emission targets, illustrated by the following figures (*Figure 3* to *Figure 5*).

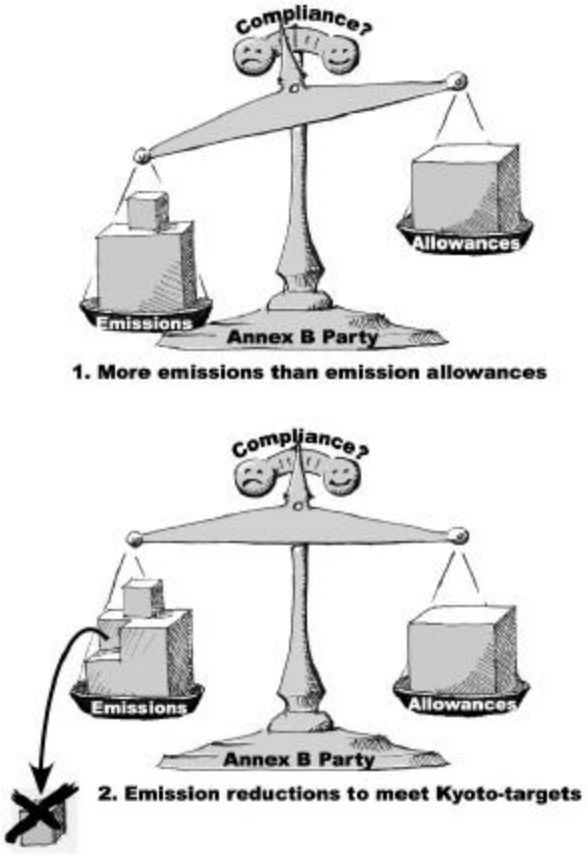

Figure 2 – *The basic concept of the illustrations.*

B.1. "Equivalence based" Accounting.

Theory

16. Equivalence based accounting (e.g. "tonne-year") rests on the assumption that the sequestration and subsequent storage of 1 tonne of carbon for a certain "equivalence" time (e.g. 46 or 100 years) would offset 1 tonne of emissions – no matter whether the stored tonne of carbon is re-emitted after the "equivalence" time, or not. In the original proposal, the project generates a flux of credits over time (yearly credits equal average mass of additionally stored carbon divided by the equivalence time in years). Figure 3 displays a "investor-friendly" modification, where all credits that the project is likely to create will be given upfront.

Problems

17. *Scientifically wrong foundation*: The assumption, that there exists something like a finite "equivalence" time is scientifically wrong. Only an additional sequestration and subsequent permanent storage can offset an emission[7].

18. *No long-term climatic benefits from temporary carbon storage*: Often claimed, but simply wrong, is the argument that "the temperature increase will be delayed forever" due to temporary carbon storage. As well, any justifications for the "equivalence" based accounting scheme by reference to the 100 year time horizon for global warming potential (GWP) calculations also do not hold: the 100 year time horizon is a floating time horizon from the point of emissions onwards, which is not equivalent to disregarding any emissions that occur in 100 years from now – as many "equivalence" based accounting schemes suggests.

19. *No monitoring/verification incentives.* In the case that credits are given upfront there are no incentives for either the project developer or the buyer of the credits to verify and monitor whether the carbon continues to be sequestered and stored (illustrated by grey shaded trees in Figure 3).

20. *Different to Annex B sink accounting*: Any equivalence based accounting scheme would lead to a fundamentally different treatment of CDM sinks compared to those in Annex B countries. In Annex B countries, full debits are – in principal – given for re-emissions, which wouldn't be the case for CDM afforestation and reforestation projects (see section G).

21. Thus, any "equivalence" based accounting schemes ("tonne-year" approach and modifications thereof) are clearly not appropriate for CDM sink accounting.

[7] note qualifying statement in footnote 5.

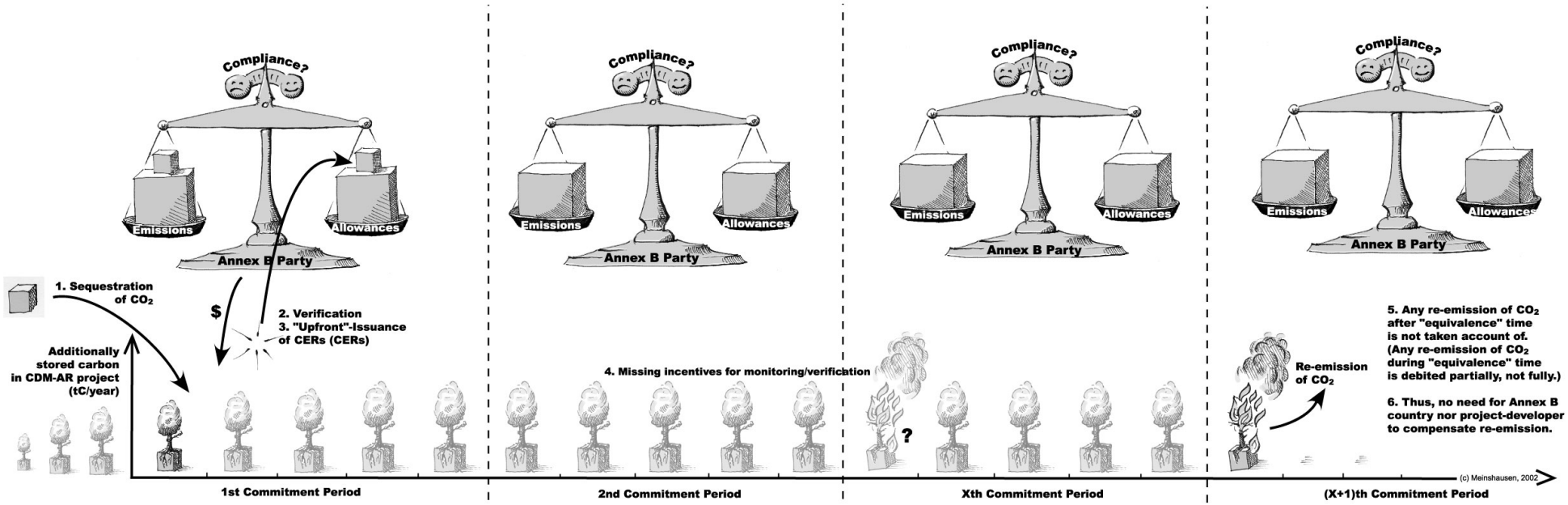

Figure 3 – The „Equivalence“ based accounting proposals

B.2. The original "Colombian" proposal.

Theory

22. The original Colombian proposal (FCCC/SBSTA/2000/MISC8) intends to address non-permanence of sink projects by issuing "expiring" credits. These expiring credits have to be replaced by another credit after their "expiration" lifetime. The credit lifetime can for example be the envisaged project lifetime (e.g. 30 years). Thus, assuming (a) that the additionally stored carbon in the project is not re-emitted before the end of the credit lifetime and (b) that the expiring credit would be offset by a truly additional emission reduction, the Colombian proposal could – in theory – offer an accounting scheme which overcomes some shortcomings of the "equivalence" based accounting proposal.

Problems

23. Although much better than the "equivalence" based accounting schemes, the original Colombian proposal does not solve the permanence issue at all:

- *Reduction obligations deferred into far future*: The obligation to reduce emissions is simply deferred by some decades into the future. This is not acceptable, given that future generations face the need for much more stringent emission cuts anyway.
- *Diminishing incentives for strong future targets.* In anticipation of expiring credits, which will have to be offset, countries might be unwilling to commit themselves to stringent emission reduction targets in the 2nd and subsequent commitment periods[8].
- *No monitoring/verification incentives.* There is no inherent incentive structure - for either the investor country or the project developer - to monitor and verify the additional carbon stocks in the project once the credits have been given (illustrated by grey shaded trees in *Figure 4*).

24. Thus, the original Colombian proposal is clearly not appropriate as an accounting scheme for sinks under the CDM.

[8] This problem of sinks, i.e. diminishing incentives for strong future targets, is created by the non-permanent nature of sinks rather than by the accounting proposal, which reflects this non-permanent nature. Furthermore note that there are additional shortcomings of sinks, such as reduced technological and social energy saving innovation and dissemination, that cannot be solved by the proposed accounting schemes.

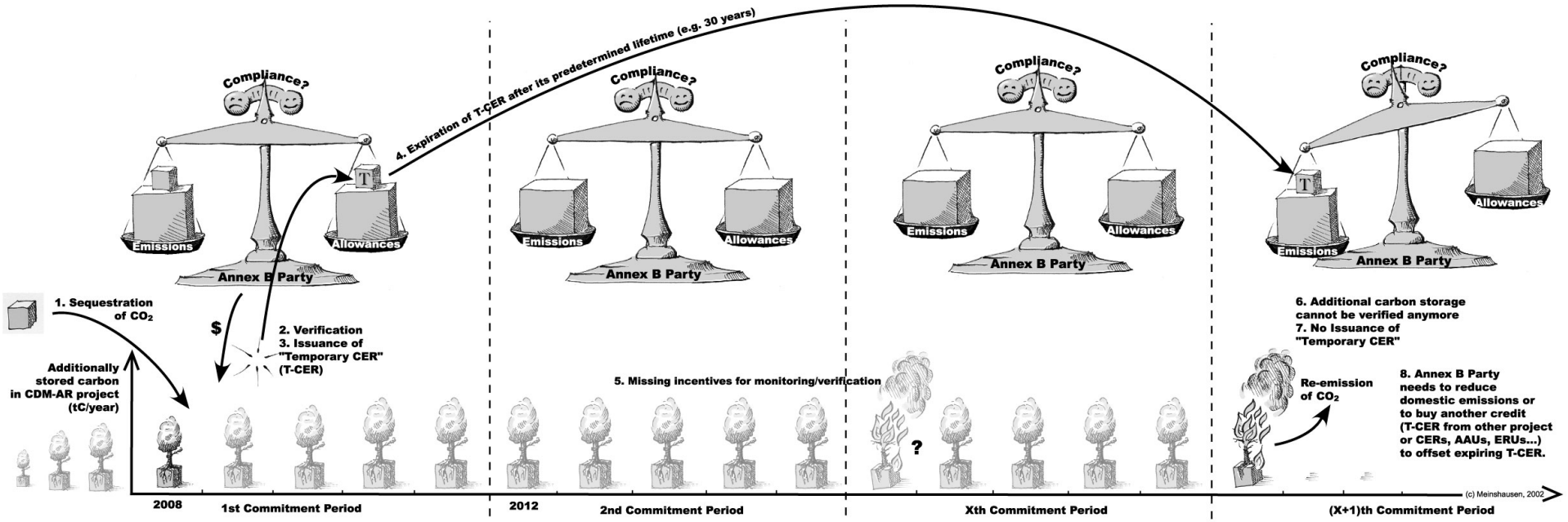

Figure 4 – The original "Colombian" proposal

B.3. Modified "Colombian" proposal ("T-CER$_5$").

Theory

25. A modified version of the Colombian proposal simply adjusts the expiration lifetime of the "temporary credits" (T-CERs or T-RMUs) to the length of one commitment period. Thus, for a multi-period CDM afforestation/reforestation project, each 5 years new T-CERs will be issued according to the verified amount of additionally stored carbon (see points 2;3 5;6 and 8;9 in Figure 5). In the buyer's registry, the expired T-CERs have to be replaced after the expiration lifetime: in the 2nd commitment period (CP) emission credits are cancelled - equivalent to the amount of expired T-CERs from the 1st CP.

26. Thus, this modified version is basically identical to the original Colombian proposal except that the expiration lifetime of the credits is fixed to one commitment period. Assuming the carbon will be additionally stored over 30 years, the net-effect of the Colombian proposal and T-CER$_5$ accounting is equivalent, since expiring T-CERs are just balanced by newly issued T-CERs throughout the project lifetime.

27. One single T-CER credit can be seen as an allowance to delay an emission reduction until the next commitment period. When no additionally stored carbon can be verified any more (in the X+1th CP in Figure 5), no new T-CERs will be issued. Although no direct debits are assigned to the re-emission, the net-effect is in fact as if debits were given: expiring T-CERs from the first commitment period have to be replaced. In effect, the T-CER approach more resembles the stock-change accounting schemes for sinks in Annex B countries than the other accounting proposals (similar verification incentive each commitment period; full debits for re-emissions – cp. Figure 5 and Figure 6).

Outstanding Issues

28. Although the T-CER approach is significantly better than both the original Colombian proposal and the "equivalence" based approaches, there are several outstanding issues that have to be resolved, such as:

- *Provisions must allow for exclusion of sinks*: Assuming it turns out that the issues of additionality, leakage, non-permanence, uncertainties, socio-economic and environmental (biodiversity) impacts cannot be satisfactorily resolved, there mustn't be any sinks in the CDM for the 2nd CP. Thus, provisions have to allow a "CDM-sink-free" Kyoto Protocol at any time in the future.
- *Diminishing incentives for strong future targets*. In anticipation of expiring credits, which will have to be offset, countries might be unwilling to commit themselves to stringent emission reduction targets in the 2nd and subsequent commitment periods[9].
- *No Banking*: In line with the provisions for RMU's, no sink credits (including the T-CERs) should be bankable. Or in other words, T-CERs must only be used towards compliance in the commitment period of their issuance.
- *Replacement options*: whether T-CERs can be replaced by T-CERs or only by non-temporary credits does not seem to be of practical accounting importance, since credits can be "swapped" any time. However, accounting provisions at the registry level might require that expiring T-CERs are offset by cancelling a non-temporary emission credit. A new T-

[9] see footnote 8.

CERs will then replace the cancelled non-temporary credit and the net-effect is the same, whether T-CERs are directly replaced by T-CERs or not.

- *Leakage, uncertainty, biodiversity impacts problems are not resolved*: Obviously, the T-CER approach, as well as the other two accounting proposals, does not resolve the crucially important problems that are associated with CDM sinks. Thus, stringent, watertight modalities to prevent leakage, minimise uncertainties, exclude negative impacts on biodiversity etc are still urgently needed (see separate CAN-submission).

29. Like all other accounting proposals, the T-CER approach does not resolve the fundamental non-permanence problem of sinks. However, the T-CER approach seems, for the meantime, to be the best accounting proposal to address and ameliorate the non-permanence problem.

B.4. Accounting for sinks under Art. 3.3/3.4 in Annex B countries.

*30. For comparison reasons only, a simplified illustration of the general concept of sink crediting in Annex B countries is given. This illustration (*Figure 6*) does not highlight the numerous problems and shortcoming attached to crediting of sinks under Art. 3.3, 3.4 and Art. 6.*

Theory

31. An Annex B Party can issue emission credits (in this case called "Removal Units" - RMUs) for absorbing greenhouse gases due to agriculture and forest management activities (Art. 3.4) as well as afforestation, reforestation (Art. 3.3). Thus, these emissions credits add to the overall allowance for domestic greenhouse gas emissions from the energy sector, roughly speaking. If terrestrial carbon stocks decrease again, which means that sequestered carbon is re-emitted to the atmosphere, the Annex B country has to undertake additional emission reductions in order to offset those re-emissions from forests and agricultural areas. Figure 6 best fits accounting of Art. 3.3 afforestation and reforestation activities. A slightly modified accounting approach is, for example, applied to Art. 3.4 agricultural activities (net-net accounting).

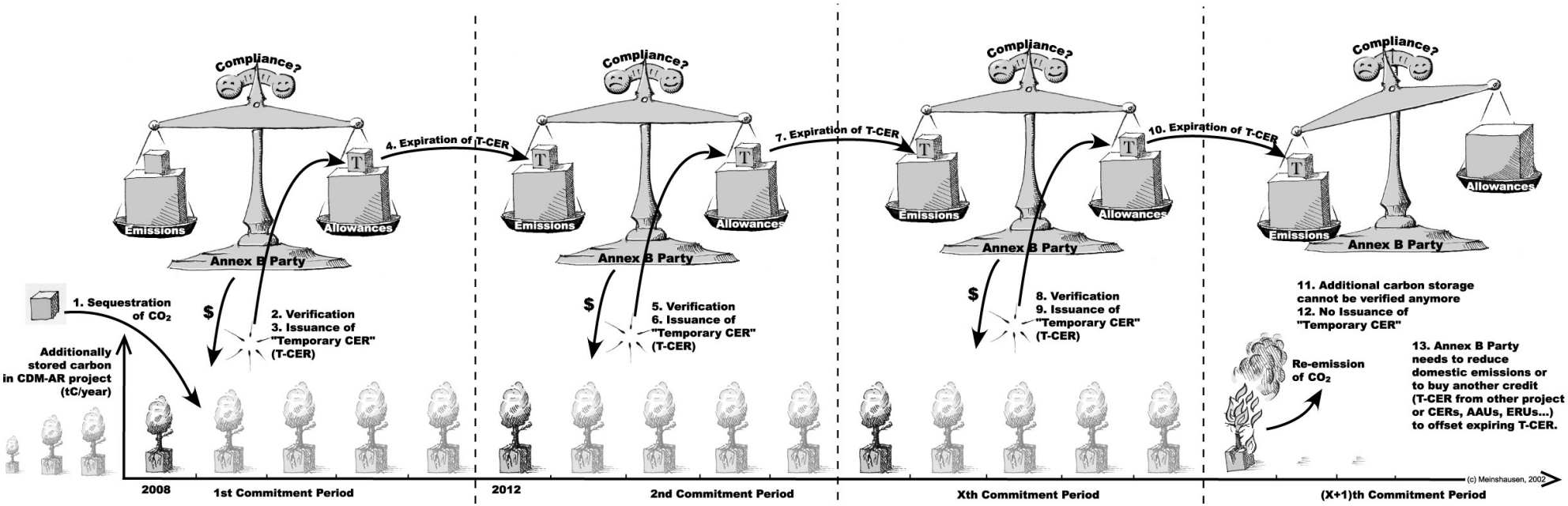

Figure 5 – T-CER – The modified "Colombian proposal"

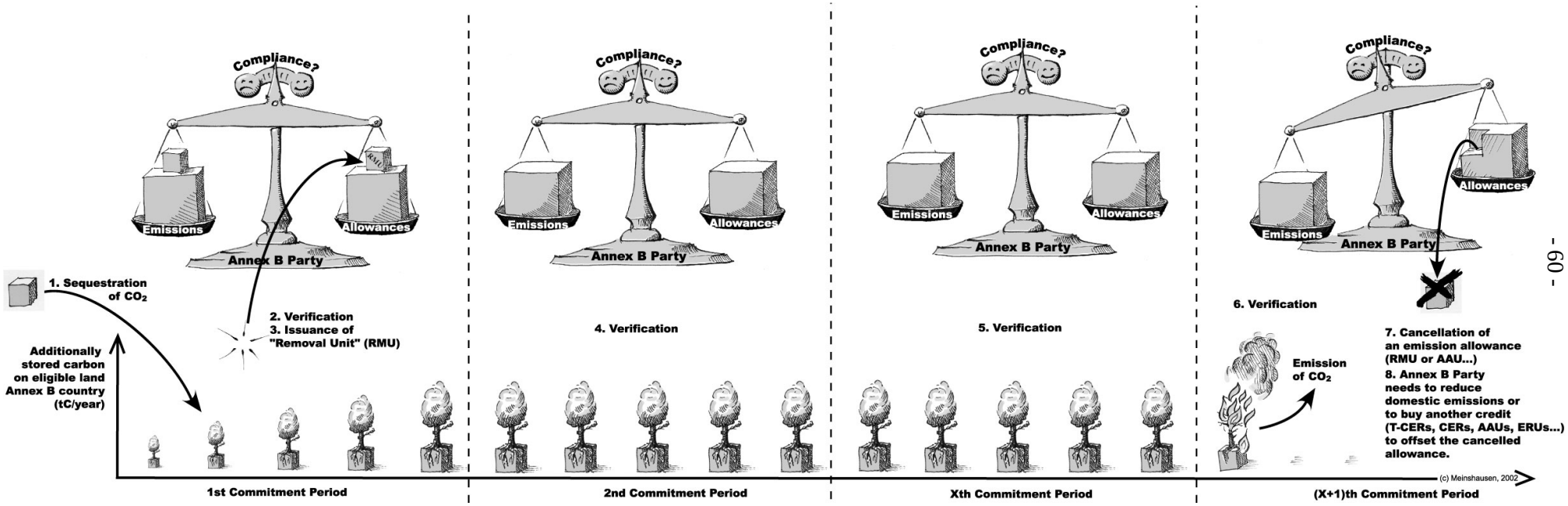

Figure 6 – Accounting for sinks under Art. 3.3/3.4 in Annex I countries

V. CONCLUSION

32. Accounting for sinks under the Kyoto Protocol causes a number of severe problems, which is why Greenpeace and CAN had continuously warned against sinks in the past. Now, that the Bonn Agreement and Marrakech Accords include the possibility to account for afforestation and reforestation under the CDM, many proposed accounting schemes are likely to worsen these problems. For example, the original Colombian proposal simply defers emission reduction obligations far into the future. Regarding the "Equivalence-time" based accounting proposals; they fall short of any scientific basis by not debiting all re-emissions. Therefore, neither the original Colombian proposal nor any "equivalence" based approaches are acceptable.

33. Compared to these two proposals, the so-called T-CER approach, with a credit lifetime of one commitment period, offers significant improvements. Nonetheless, there are a number of outstanding issues that still have to also be resolved before this T-CER accounting scheme should be adopted. Among these,

- an additional project screening requirement must rule out short-term unsustainable projects to address non-permanence (i.e. industrial mono-culture plantations have to be excluded),
- T-CERs must only be used towards compliance in the commitment period of their issuance,
- negative impacts on biological diversity must be avoided
- and any potential leakage and uncertainties fully accounted for.

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34. For more information about Greenpeace's climate campaign, please visit www.greenpeace.org -> campaigns -> climate change.

PAPER NO. 5: THE WORLD CONSERVATION UNION AND THE UNITED NATIONS ENVIRONMENT PROGRAMME

MODALITIES AND PROCEDURES FOR INCLUDING AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES UNDER ARTICLE 12 OF THE KYOTO PROTOCOL

August 2002

BACKGROUND

At its 16th session, the SBSTA agreed on the terms of reference and an agenda to develop definitions and modalities for including afforestation and reforestation project activities under the CDM in the first commitment period, taking into account the issues of non-permanence, additionality, leakage, uncertainties and socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, and being guided by the principles in the preamble to draft decision --/CMP.1 (*Land use, land use change, and forestry*). As part of the work programme, Parties and other organizations have been invited to provide submissions to the UNFCCC secretariat by 20 August 2002 on their views on the issues related to modalities. IUCN and UNEP welcome the opportunity to submit views on the above matters, and how to address them.

MODALITIES

The issues of non-permanence, additionality, and leakage are strongly related to the environmental or socio-economic settings of projects. The modalities for including afforestation and reforestation projects in the CDM will need to reflect this relationship. Otherwise, emission reductions resulting from project activities may not lead to real, measurable and long term benefits related to the mitigation of climate change, or assist non-Annex I countries in achieving sustainable development, as described in Article 12 of the Kyoto Protocol.

(i) Non-permanence refers to the fact that emissions reductions resulting from afforestation and reforestation project activities may not be durable over time. Some factors that may compromise the durability of emissions reductions are natural risks, such as heavy rainfall, pests, disease, fire, and climate change; risks from human-induced fire or encroachment; risks from uncertain land tenure or property rights, risks from changes in the price of land and the opportunity cost of land. Risk assessment can help quantify the probability that a particular, undesirable scenario will occur, and if carried out early in the planning process, can be used by project participants to design strategies to mitigate risk. Risk mitigation strategies include creating project insurance, diversifying project activities, and establishing rules for project credit liability. The incentive to generate durable emission reductions from afforestation and reforestation projects will also be influenced by the nature of the regime for project credits and national regulations for carbon ownership.

Risk mitigation is not a replacement for good project design, particularly when the issue of poor peoples' rights and livelihoods are involved. Projects that are carried out on land for which poor communities have alternative priorities such as agricultural production or subsistence will not be durable over time, unless communities are meaningfully engaged in

project activities, and that those activities deliver benefits that are either consistent with or enhance local people's livelihood needs. Project investors, buyers and sellers will have a strong interest in the environmental and social effects of a project activity because if a project is likely to cause social conflict or environmental damage, it may have higher risk of reversal, be less permanent, and therefore have lower market value.

(ii) Additionality refers to the requirement under the Kyoto Protocol that human-induced emissions of greenhouse gases by sources or removals by sinks are below those that would have occurred in the absence of the project. Additionality can only be substantiated through the creation of a credible and verifiable baseline (a scenario of emissions performance against which changes in carbon stocks occurring in the project can be measured). Establishing a baseline for forest and land use projects requires knowledge of past, present and planned land use policies, programmes and practices in the area, the local socio-economic situation, as well as broader national, regional and even global trends that may affect the performance of the project. A credible and verifiable baseline can be established for afforestation and reforestation projects by using aggregated data of historical and projected future trends in land use in the country or region and information on sectoral and national land use and development plans in combination with more project specific data generated by project participants, including information on local tenure regimes and the availability of land.

A combination of project-specific and standardised baselines is suggested for afforestation and reforestation projects. While industrial or large-scale projects are proposed to apply to a standardised baseline ensuring consistency on a national scale, certain community driven or small-scale projects may apply expedited procedures for project-specific baselines ensuring appropriate reflection of local and social conditions.

Because the forestry sector is subject to a variety of economic, social, political and physical changes, and because the project lifetimes of afforestation and reforestation projects are likely to be long, project baselines should be reviewed and updated on a periodic basis relating to the commitment or project crediting period. This implies that calculations of additionality will also need to be adjusted over the same period.

(iii) Leakage is the unanticipated decrease or increase in greenhouse gas benefits outside the project's boundary that have occurred as a result of the project activities. From an environmental and social point of view, project leakage is most likely to occur when an activity that was formerly inside the project boundary is shifted outside the project. For example, if a project establishes forest on land that would otherwise have been used for agricultural purposes, the displaced farmers may move to an adjacent area and convert it to agricultural land, leading to greenhouse gas emissions, and possibly biodiversity loss. Projects implemented on land facing population growth and high demand for agriculture and subsistence are likely to have impacts outside the project boundary. Project level approaches to address leakage include providing socio-economic benefits to local people affected by the project. This includes land tenure and user rights, stakeholder participation, improvement of local income or capacity building. All of these possible approaches should be reflected in the host countries' endorsement of projects and how they contribute to sustainable development objectives.

Two options, Forest Landscape Restoration and agroforestry are considered particularly helpful in minimizing the risk of decreased greenhouse gas benefits from project activities.

Forest Landscape Restoration is a conceptual framework, whose application could help minimize the risk of decreased greenhouse gas benefits from project activities. Forest Landscape Restoration builds on a number of existing rural development, conservation and natural resource management principles and approaches, bringing them together to help restore multiple goods and services that enhance ecological integrity and provide tangible to local people living in degraded or deforested landscapes. It differs from more conventional approaches to afforestation and reforestation that tend to be limited to increasing tree cover, usually for a limited range of goods and services. Forest Landscape Restoration employs many technical approaches including natural regeneration, tree planting and, of particular relevance to risk mitigation in carbon sequestration projects, agroforestry.

Agro-forestry is an integrated management system for trees on farms, in pastures and in the wider agricultural landscape. Agro-forestry schemes vary from the simple (scattered trees in, and live fences around, farm-land) to the complex (e.g. multi-storey home gardens), and include silvo-pastoral systems, urban agro-forestry, and crop-fallow rotations. Agro-forestry systems do not necessitate a change in land use, and can be used as a framework for optimizing the trade-offs between food production, poverty alleviation and environmental management.

Under the current definitions of afforestation and reforestation found in the annex to Decision 11/CP.7 (Land use, land-use change and forestry), Forest Landscape Restoration and a wide variety of agro-forestry options would be applicable for project activities. While helping to minimize negative project leakage, both approaches may even result in increased project benefits by introducing a new land management approach that becomes more widely adopted in the area, leading to unanticipated carbon sequestration.

All human-induced emissions by sources or removals by sinks of greenhouse gases that are measurable and can be attributed to the project activity should be stated in a CDM project document, and verified by a third party.

(iv) Socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, vary from region to region and locality to locality, and need to be analyzed on a project-by-project basis. Three narrative approaches are available for taking into account these issues in projects:

- Summative assessment approach
- Process-oriented approach
- Preventive approach

From the social side, it must be stressed that even local stakeholders are often not a homogeneous group. The perceptions and survival strategies of the landless subsistence farmer, settled agriculturist, the livestock rancher, the charcoal-maker, the micro-entrepreneur, or local trader, of men or women, are quite different. There is a high risk of trade-offs in carbon sequestration projects, where a specific stakeholder or a group of stakeholders is clear beneficiary, whilst others might be disadvantaged by projects that promote climate change mitigation over other objectives. Project participants, validators and certifiers should therefore include social heterogeneity in their project analysis and review. Project participants have an additional responsibility to elaborate strategies aimed at reducing social hardships and/or social conflicts between local stakeholders, and ensuring that the most disenfranchised members of society do not end up further disadvantaged.

From the environmental side, converting non-forested land to forests will have varying impact on biodiversity, depending on the site, the methods and species used. Where afforestation or reforestation are done to restore degraded lands that were historically forested; use native species; and employ techniques for ground preparation, planting and management that are ecological sensitive, they can produce environmental benefits, such as watershed protection, erosion and salinisation control. Where afforestation or reforestation are carried out using species that are invasive and not native to the area, or on lands that historically were not forested (and convert native ecosystems to forest), they may result in net negative impacts on environmental services. Invasive species are mostly fast-growing, wind-dispersed trees that scatter numerous seeds and thus are able to invade and spread rapidly. Among the more than 650 examples of invasive woody plants, many are commonly used as plantation species. Alien invasive species can overwhelm native species and destroy habitat. Effects can go well beyond the plantation site; for example some invasive forestry species consume large amounts of water, and can lower water tables, reduce water flow and increase soil erosion. In cases were non-native species are planted for the rehabilitation of degraded sites, medium to long-term management plans should be provided by project managers for options of re-naturalisation in subsequent rotations. Decision VI/23 of the Convention on Biological Diversity outlines 15 guiding principles for the prevention, introduction and mitigation of impacts of invasive alien species. Parties and other Governments are further urged by the CBD to make the development and implementation of alien invasive species strategies and action plans a priority as part of national CBD implementation (Decision V/8). The IUCN Species Survival Commission has developed guidelines for the prevention of biodiversity loss caused by alien invasive species.

Various options for assessing the environmental and social impacts are available. A summative assessment, or impact assessment, is a formal approach that aims to evaluate (ex-post) or estimate (ex-ante) social and environmental impacts throughout the life-span of a project. Impact assessments identify trade-offs between carbon sequestration and people's livelihoods and/or the environment. Further, they provide useful inputs for evaluating project components that supply the resource needs of local communities and provide socio-economic benefits that create incentives to maintain the project.

Though impact assessment techniques vary, most processes have some common features. These include:

- **Screening** to determine the need for, and appropriate level of, assessment
- **Preliminary assessment** to rapidly determine key impacts, their magnitude and significance, and their importance to decision making
- **Scoping** to define the time and spatial parameters of the assessment
- **Detailed assessment** of the impacts, their magnitude and significance, measures to mitigate adverse impacts and maximize positive impacts
- **Review** to determine the adequacy of the assessment in terms of informing decision makers
- **Monitoring** of the impacts and the implementation of prescribed mitigation measures
- **Audits** to review the adequacy of the impact assessment process, and in some cases
- **Certification** of the audit results by an accredited, independent third party.

Impact assessments tend to focus on a specific project, however, they can also include the evaluation of other options in the landscape that might be more beneficial, or have less negative impact.

The second approach, a process oriented approach deals with social and environmental issues during the planning, implementation and evaluation phases of a project. The process-oriented approach proposes five steps to identify and address the environmental and socio-economic impacts associated with forestry mitigation projects. The five steps are as follows:

- Setting the (technical, financial, and process-related) framework;
- Defining the social groups or;
- Assessing risks of technical measures in relation to the defined social groups;
- Analyzing the processes and the interrelationship between the defined social groups;
- Assessing the social components of sustainability in respect of the proposed measures.

In the context of the Clean Development Mechanism, such a continuous approach provides a possibility to monitor and evaluate the social component of forestry projects in the context of sustainable development, as articulated in the provisions of Article 12 of the Kyoto Protocol.

A third approach, the preventive approach, focuses on social groups and natural environments that are likely to be negatively affected by particular changes induced by the project. These include social measures often referred to as “safeguards.” Safeguard policies are intended to protect vulnerable social sectors and natural environments in countries, especially in those with weak institutions and weak social and environmental policies. Safeguards for forestry projects address topics related to participatory planning, ecological zoning, demarcation and land titling, and indigenous reserves in project design.

Though assessment orientated policies have been considerably improved since their introduction over twenty years ago, important challenges remain to their use. Safeguards are heavily “front-loaded,” with little emphasis on implementation and supervision. They can result in higher transaction costs and project preparation delays. Most problems arise in projects that address the distribution of forest resources such as creation and demarcation of indigenous lands or protected areas. When used in isolation, safeguards have not always triggered broader consultations with key stakeholders, including those most likely to cause the harm.

Despite these problems, a preventative, "safeguards," approach may have merit in the context of afforestation and reforestation projects under the Clean Development Mechanism. In combination with a process-oriented approach (described above), some basic "safeguards" can be developed of who/what are the vulnerable social groups and natural environments, and by which measures they are affected. Assessment of positive project impacts on socio-economic and environmental parameters is equally supported in view of the requirements for sustainable development.

Each of the three approaches - summative assessment, process, and safeguards - should not be viewed as exclusive but rather as complementary to each other. Each may need to be applied at different stages of a project cycle.

Finally, several approaches for considering socio-economic and environmental issues in projects have been developed and tested in international forest certification processes. These often proved to have marginal cost implications. The experience gained in this field should be considered for the development of modalities of afforestation and reforestation projects under the CDM.

PROCEDURES

Through Decision 17/CP.7, UNFCCC Parties decided on procedures for projects under the Clean Development Mechanism. IUCN and UNEP take this opportunity to offer the following views on how these procedures may be amended to better suit the inclusion of afforestation and reforestation projects, in light of the strong environmental and social implications that afforestation and reforestation projects are likely to have in non-Annex I Parties.

(i) Executive Board: In accordance with paragraph 5(o) in the annex to Decision 17/CP.7, the Executive Board may wish to establish procedures for stakeholders, accredited observers and Parties to the United Nations Framework Convention on Climate Change to be involved in project reviews by the executive board. Such procedures could enable individual, group or community stakeholders as well as UNFCCC Parties and accredited observers to bring relevant information to the executive board at the time that an afforestation or reforestation project is validated or certified emission reductions are issued.

(ii) Operational entities: As part of the current procedures for validating and registering a project under the CDM, the host Party must confirm in writing that the project activity assists it in achieving sustainable development. The host Party could be requested to elaborate in this confirmation how a afforestation and reforestation project activity conforms with the principles in the preamble to draft decision --/CMP.1 (*Land use, land use change, and forestry)*, and specifically how it "contributes to the conservation of biodiversity and sustainable use of natural resources."

Although it is the host Party's prerogative to confirm that a CDM project activity assists in achieving sustainable development, it is necessary to require an explanation of the basis for this confirmation. Otherwise, proper validation could not take place, as the basis for conducting the validation would be incomplete. Moreover, while a host Party has wide latitude in defining how sustainable development is achieved, certain principles agreed to by the Conference of the Parties must also be taken into account when providing such a confirmation.

(iii) Validation, verification and certification: Because afforestation and reforestation projects are likely to have strong environmental and social implications, Parties may wish to consider making environmental and social impact assessments a mandatory feature of the project validation process. Parties should consider whether these assessments should be required of all projects or if exceptions should be made with some types of projects; for example small-scale projects (see below) where the cost of such assessments would unduly raise the overall transaction costs.

Operational entities could require project participants to demonstrate the environmental neutrality and social equitability of the project activity; that is, to demonstrate that the project, at the least, does not lead to negative environmental outcomes nor that it does not

further disadvantage the poorest members of society. Operational entities could also require project participants to include a local benefit sharing arrangement, if any, in the project document so that it can be reviewed during project validation and certification.

Parties may wish to elaborate on the stakeholder consultation requirements necessary for project validation, verification and certification under the Clean Development Mechanism. For example, project participants could be required by operational entities to undertake a stakeholder consultation and analysis, according to recognised methods and practices. The information gathered from stakeholder consultation and analysis would provide valuable information on the possible mechanisms by which project leakage would occur, or help to identify potential sources of project risk including uncertain property rights or competition over land uses. Stakeholder consultation and analysis could also help to determine existing land management approaches and identify opportunities for introducing improved methods.

(iv) Provision for small-scale CDM afforestation and reforestation projects: In implementing Decision 17/CP.7, paragraph 6 (c), the Conference of the Parties, through the CDM Board, may wish to also include the development of simplified modalities and procedures for project activities involving small-landholders under Category III (other project activities). These might help to reduce the high transaction costs associated with these projects, as compared with other CDM project activities.

PAPER NO. 6: WORLDWIDE FUND FOR NATURE

SUBMISSION BY WWF ON ISSUES RELATED TO MODALITIES FOR INCLUDING AFFORESTATION AND REFORESTATION UNDER ARTICLE 12
August 20, 2002

WWF welcomes the opportunity to submit its views to the UNFCCC Secretariat for distribution to Parties. WWF fully supports and contributed to the submission by the Climate Action Network. In *this* submission WWF briefly summarizes the risks of Afforestation and Reforestation (A&R) projects, and then outlines how forest landscape restoration, coupled with strong rules as described in the CAN submission, can potentially mitigate some of these risks.

WWF believes that forest landscape restoration projects are what sinks in the CDM should be all about and could provide environmental and social benefits. WWF therefore encourages Parties to adopt rules that would make these types of projects the norm.

Forests, Biodiversity, Livelihoods and the CDM
WWF's Approach

The debate on forest carbon sequestration and the potential use of sinks under the Kyoto Protocol is controversial, and has provoked much debate, research, analysis and difference of opinion. The inclusion of afforestation and reforestation under the CDM at Marrakech, and the current work program being developed by SBSTA, provides and opportunity to explore both the risks and opportunities that could be presented to project implementers. Below is a brief summary of the identified risks, which leads to the presentation of a possible alternative to address the risks, and potential environment and social co-benefits.

A summary of the risks:
Social impacts - Lack of adequate or effective local input, participation and benefit sharing, displacement of economic activity, displacement of people, reduced access to land resources
Environmental impacts - perverse incentives for sustainable forest management, intensification of forests leading to more chemical inputs, simplification of forest structure and function, inappropriate and large-scale exotic species plantations
Permanence - Projects at risk from natural causes such as fires and pests, as well as human-induced causes (agricultural conversion, fire, maintenance)
Leakage - displacement of economic activities, as well as people and carbon if project design is flawed and/or land tenure disputed
Scientific and measurement uncertainty - Questions of whether the carbon and atmospheric benefits of sinks projects can be quantified, measured and monitored at appropriate scale

Forest Landscape Restoration - An alternative?

Forest Landscape Restoration is defined as: A process to restore ecological integrity and functionality and enhance human well-being in deforested or degraded forest landscapes (WWF). This could include such activities such as watershed restoration, agroforestry and non-timber forest product management. Forest landscape restoration activities are consistent with the definitions of A and R and forest currently in the Marrakesh Accords.

What Makes Forest Landscape Restoration unique?

- Focuses on restoring **forest functions** and improving **ecological processes** at a landscape level
- Deals with **scale** via a landscape approach
- Involves both **socio-economic** and environmental dimensions
- Addresses **root causes** of degradation and deforestation
- Brings in **valuation** of forest goods, services and processes
- Looks for **enabling policy** environments
- **Complements** protected areas work and sustainable forest management work
- Increases forest **resilience** through enhanced connectivity and species diversity
- Consists or a mixture of locally **appropriate approaches**: - ecological corridors, agroforestry, on-farm trees, secondary forest regeneration, diverse plantations.

Can Forest Landscape Restoration help address issues of CDM A&R?

As concluded in the IPCC Special Report on LULUCF, more research is needed on sinks questions overall, and on forest landscape restoration for A&R in particular. Forest landscape restoration can potentially address the risks in the following ways, assuming that real and effective local participation and benefit sharing were stated outcomes of project design:

Leakage and Additionality

- Create additional forest and carbon assets
- Design for ecological benefits and social benefits
- Not Business as Usual - promotes change and incentives for maintaining forest asset
- Stabilize land use with links to land use policies and positive local incentives

Permanence

- Promote secure land tenure and positive land use options
- Integrate incentives for forest (and carbon) maintenance and protection at local and national levels
- Promote diverse forest species and forest functions, goods and services, such as watershed protection and non-timber forest products
- Increase resistance and resilience to threats

Environmental and Biodiversity Co-benefits

- Promote corridor restoration, fragment reduction, habitat restoration, resistance and resilience to stress, including climate change
- Increase species diversity
- Integrate ecological services – enhance hydrological regimes, stabilize soil, combat desertification
- Reduce pressure on natural forests, augment buffer zones, promote restoration in frontier forests to avoid perverse incentives for natural forest conversion
- Maximize forest quality and diversity, not just carbon quantity

Social Co-benefits

- Enhance livelihoods through integrated land uses - multiple goods and services such as agroforestry, timber & non-timber forest products, fodder, etc.
- Promote land tenure security - link to policies to reduce negative land use, community forestry, etc.
- Increase productivity through multiple land use approach
- Create real partnerships for long-term gains and reduce perverse incentives for clearing

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