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SPECIAL BULLETIN

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CLIMATE CHANGE — CALL FOR TRUTH IN TARGETS

CARBON STOCK REFERENCE LEVELS NEEDED

Carbon stock change reporting — a vital building block for land-based accounting

Important opportunities to include estimation of carbon stocks and stock changes when setting forest reference levels must be seized. The views of Parties and observers to the UNFCCC regarding forest reference levels for REDD+ have been transparently sought by SBSTA. Meanwhile deliberations on LULUCF's perverse accounting rules for Annex 1 forest management continue behind closed doors.

We strongly recommend that alongside estimating emissions and changes in rates of emissions equal attention should be given to carbon stocks and carbon stock changes when determining modalities for forest reference levels in REDD+. Countries should be able to choose to do carbon stock change reporting and accounting when appropriate.

Having reference levels for carbon stocks is an essential building block for land-based accounting. It is important that the following decisions are made in Durban:

- The COP decides that land-based accounting will be used by all Parties for all relevant reporting and accounting purposes, to give effect to any and all commitments made beyond the second commitment period of the Kyoto Protocol, and / or for any new agreement arising from the LCA track.

- That SBSTA includes in its work program the timely development of methodologies, and guidance for their use, which allows all Parties to adopt land-based accounting within that timeframe.

With respect to LULUCF rules for Annex 1 Parties, there is a current proposal contained in the LULUCF co-chairs' non-paper to refer the issue of land-based accounting to SBSTA to initiate a work programme to explore ways of moving towards, *inter alia*, a land-based approach, and report to the Conference of the Parties (COP) serving as the Meeting of the Parties to the Kyoto Protocol (CMP) on the outcomes of this program.

The COP needs to be asked to decide in Durban on the scope and timing:

- That it will broaden this request from the CMP such that SBSTA provide advice that not only addresses the needs of Annex 1 Parties to the Kyoto Protocol, but also those Parties involved with a REDD+ mechanism, or with any other reporting and accounting obligation on terrestrial carbon; and

- To ask for advice to be provided in time for COP 18 and CMP 8 in 2012.

We are aware that Parties are engaged in high level negotiations on whether there will be a second commitment period of the Kyoto Protocol and on the conclusion of a new international climate agreement arising from the LCA track of negotiations. Whatever eventuates, it is important that a commitment to land-based accounting be implemented in the new agreement(s) and beyond the second commitment period of the Kyoto Protocol.

Loss of carbon stock due to industrial logging and 'regeneration' burning, Tasmania, Australia.

WELCOME TO THIS THIRD SPECIAL BULLETIN ON TRUTH IN TARGETS. It discusses reference levels, compensation baselines, and why measuring forest degradation and carbon stock changes of forests and their soils is vital to tackling climate change in REDD+ and LULUCF.

In this bulletin:

WHAT IS A REFERENCE LEVEL, A REFERENCE EMISSION LEVEL, A BASELINE…? HOW SHOULD THEY BE USED?

Need to clearly define terms at the outset

Currently, there is no agreed definition or consistent use of 'reference level' or 'reference emission level' in the climate negotiations (or in the literature) related to measuring emissions or carbon stocks. Similarly, 'forest reference level' and 'forest reference emission level' have no agreed definition or consistent use.

In the absence of agreed use of terms, misunderstandings are almost inevitable. Resolving this uncertainty is urgent and important. It is our view that the uncertainty created by ongoing use of undefined terms might be acting as a significant deterrent to making critical decisions on the whole range of issues relating to the management of terrestrial carbon that are before the UNFCCC.

(a) Differentiate technical and political components

There needs to be explicit recognition that the process of reporting progress towards targets, or of calculating eligibility for available incentives, has both a technical and a political component. If the technical and political components are not clearly separated, the development of any REDD+ mechanism will be beset by the same problems currently facing negotiators with respect to the future of LULUCF accounting rules under the Kyoto Protocol (KP). Past failure to separate components in LULUCF under the KP means that senior negotiators are being drawn into complex discussions over technical minutiae as a surrogate for open debate over policy. Development of a REDD+ mechanism provides negotiators with an opportunity to be transparent and sensible in taking a fresh approach.

'Reference level' is a technical concept

Our first proposition is that the term **'reference level'** (and any associated qualifiers, such as 'national', 'emissions' or 'forest') should be used to describe the **outcome of a scientifically robust technical process** based on transparently derived data through application of methodologies approved by the COP on advice from SBSTA.

'Baseline' is a political concept — derived from a subsequent process

Our second proposition is that the term **'baseline'** (and any associated qualifiers, such as 'compensation', historical, 'projected' or 'forward looking') should be adopted to describe the **outcome of a subsequent transparent political process** based on factors that might be adopted by the LCA. The baseline can then be used to transpose a technically derived reference level into a politically agreed **measure of progress towards a target and/or eligibility for incentive schemes**.

Decision 1/CP.16 provides that the REDD+ mechanism is to evolve into results-based actions — there is no suggestion that "results" are to be measured relative to the reference level alone. For this reason we see the need to introduce the new term "baseline" to allow for clear and transparent debate on how to convert a "reference level" based on historical data (see Decision 4/CP.15) into a "compensation baseline" for calculating results-based payments.

(b) Elaborate categories of reference levels

Reference levels should be regarded as key parts of approved methodologies designed to help Parties meet their obligations pursuant to the UNFCCC.

In this regard, it is important that, in developing methodologies for implementing a REDD+ mechanism, Parties do not repeat their earlier mistakes and omissions in seeking to implement the LULUCF provisions of the Kyoto Protocol, see Box 1, where Parties developed LULUCF methodologies based only on estimating and reporting changes in emissions rather than changes in carbon stocks.

It is hoped that negotiators will take this opportunity to give effect to the obligation to address both emissions and carbon stocks (reservoirs) in a more coherent and transparent way than has been the case with LULUCF rules under the Kyoto Protocol.

Box 1: Selected obligations of parties to the UNFCCC and Kyoto Protocol to protect carbon stores (reservoirs) as well as reduce emissions:

– UNFCCC Article 4.1 states that, "All parties … shall (inter alia): (d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate of sinks and reservoirs … including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;"

– Article 2.1 (a) (ii) of the Kyoto Protocol commits Annex I parties to *"(a) implement and/or further elaborate policies and measures in accordance with its national circumstances, such as* (inter alia): *(ii) protection and enhancement of sinks and reservoirs of greenhouse gases …".*

– KP Article 3.3 requires that *"the net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land use change and forestry activities, … measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article …".*

– KP Article 3.4 goes on to require each Annex I Party to *"provide, for consideration by the [SBSTA], data to establish its level of carbon stocks in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years."*

There are two categories of reference levels that warrant explicit identification and elaboration based on the commitments established by ratification of the UNFCCC. These are (1) reference levels for *emissions* and (2) reference levels for *carbon stocks*:

1. **'reference emission levels'** (RELs). This term should be used to describe estimates of actual historical GHG emissions from clearly identified 'activities' in a specific area (or a specific aggregate of such RELs). It could be further elaborated as a 'national reference emission level', a 'subnational reference emission level', a 'forest reference emission level' — or any other relevant qualifier. It might also be elaborated as an 'historical emission level' (although, 'historical' would be unnecessary because all 'technical' RELs are based on things that happened in the past — any future considerations would be based on 'baselines' politically derived from an REL).

2. **'reference carbon stock levels'** (RCLs). This term should be used to describe estimates of carbon stocks in a clearly defined area. The area will either be defined administratively, as in 'national' or 'provincial' (or other appropriate sub-national descriptor), or ecologically, as in 'forest' or other agreed land use category. Such RCLs would be based on relevant guidance, notably the latest IPCC 2006 Guidance identifying a number of separate terrestrial carbon pools. An RCL might be expressed in absolute amounts of carbon, or be expressed relative to an estimate of undisturbed, non-degraded carbon levels — the natural carbon carrying capacity of a landscape (CCC) or part thereof. Use of RCLs allows for the development of 'stock change' methodologies necessary not only to support the introduction of land based accounting but also to support a range of useful baselines (see below) currently under discussion but which have yet to be developed. Carbon stock changes can still be attributed to activities if required and justified. See Attachment 1 of this submission for further explanation on the need to focus on carbon stocks as well as emissions.

In all cases, RELs and RCLs should be regarded as technical estimates of actual emissions to atmosphere or of carbon stores, based on approved methodologies.

(c) Derive a baseline as a basis for calculating progress and / or incentives

The term 'baseline' should be used to describe the result of an explicitly political exercise of converting or applying a reference level to determine an amount to be used either as the basis for calculating progress towards meeting a target or for calculating eligibility for incentives schemes, including financial benefits such as carbon credits. Examples of such 'baselines' would include:

- **A 'forward-looking' or 'projected' baseline** based on either a direct extrapolation of an 'historical reference level' of actual emissions or on a modification of an historical reference level based on the implications of identified policy settings — or any other political choice or construct that might be agreed by a COP.

- **An 'historical' baseline**, for instance, might be simply derived from an historical reference level by choosing a specific year or period of years or by discounting or inflating such amounts by an agreed factor. Such factors might relate to the GDP of a country or province, to the scale or intensity of any driver of degradation, to the relative extent of accumulated degradation (such as Angelsen's forest transition curves[1]), or to any other factor deemed relevant by Parties.

- **A 'target' baseline** whereby a reference level of actual emissions is converted into a different amount to be included in calculations of contributions to meeting agreed targets by application of agreed accounting rules.

- **A 'compensation' baseline** whereby a reference level of actual emissions can be transposed pursuant to an agreed formula to derive an amount to be used for calculating benefits due for REDD+ eligible activities. Such benefits might be the number of credits to be issued to eligible entities pursuant to an agreed market mechanism or the scale of benefit due pursuant to any other funding mechanism adopted by or recognised by the COP.

This issue of a 'compensation' baseline is receiving much recent attention as people struggle to put the pieces together to operationalise a REDD+ mechanism. An agreement to refer to it as a 'compensation baseline' — rather than a 'reference level' — would be a good start.

In summary, we propose that the term 'reference level', and all its variants, would be used to describe technical estimates of real stock levels or emissions based on application of agreed methodologies. 'Baseline', and all its variants, would be used to describe numbers derived from reference levels by application of one or more politically chosen conversion or transposition factor.

Intact natural forest at carbon carrying capacity.

[1] Anglesen, A. 2007. Forest Cover Change in Space and Time: Combining the von Thunen and Forest Transition Theories. *World Bank Policy Research Working Paper 4117* (February).

PEAT SOIL PARTICULARITIES IN SETTING BASELINES AND REFERENCE LEVELS FOR FORESTS

ACKNOWLEDGEMENT: This article was supplied by Wetlands International, experts on forest peat issues.

The enormous pool of carbon in forest peat soil (on average, ten times larger per hectare than the entire carbon stock in the biomass of tropical forests), and its sensitivity to oxidation, means that the emissions behaviour of peat swamp forests is fundamentally different from that of forests on mineral soils. A fundamental error is often made by not differentiating sufficiently between emissions resulting from clearing a forest and ongoing emissions from forest peat soil after clearing and draining.

Emissions from clearing a forest primarily involve the removal and oxidation of forest biomass. These emissions can be considered to be more-or-less instantaneous, but they largely stop once clearing stops (and may be promptly reversed by subsequent regeneration). In contrast, emissions from peatland drainage continue until the drained area is effectively rewetted (reinstalling water level + revegetation) or the entire peat is depleted — i.e. emissions may continue for decades, or even centuries, after clearing and draining. See Figure 1.

Failure to deal properly with peatland drainage can result in wrong estimation of the relative importance of emissions. Emissions arise not only from initial, once-off peat swamp forest clearing and drainage but also continue from subsequent and ongoing peatland use. Such failure will lead to severe underestimation of the annual emissions from drained peatlands and, consequently, lead to adoption of wrong reference level scenarios and hence provision of wrong guidance for planning, policy review and development.

Reducing emissions from peat swamp deforestation and degradation (REDD+) is only possible by the combination of:

1. Preventing further peatland degradation and drainage (from new conversion or intensified drainage on already drained peatland). This will, however, merely maintain annual GHG emissions on the status quo level, because emissions from already drained peatland will continue.

2. Reducing drainage intensity in already degraded and drained peatlands. This requires peatland rewetting and reforestation (i.e. reducing drainage levels and/or intensity) is the only means to decrease annual emissions from peat.

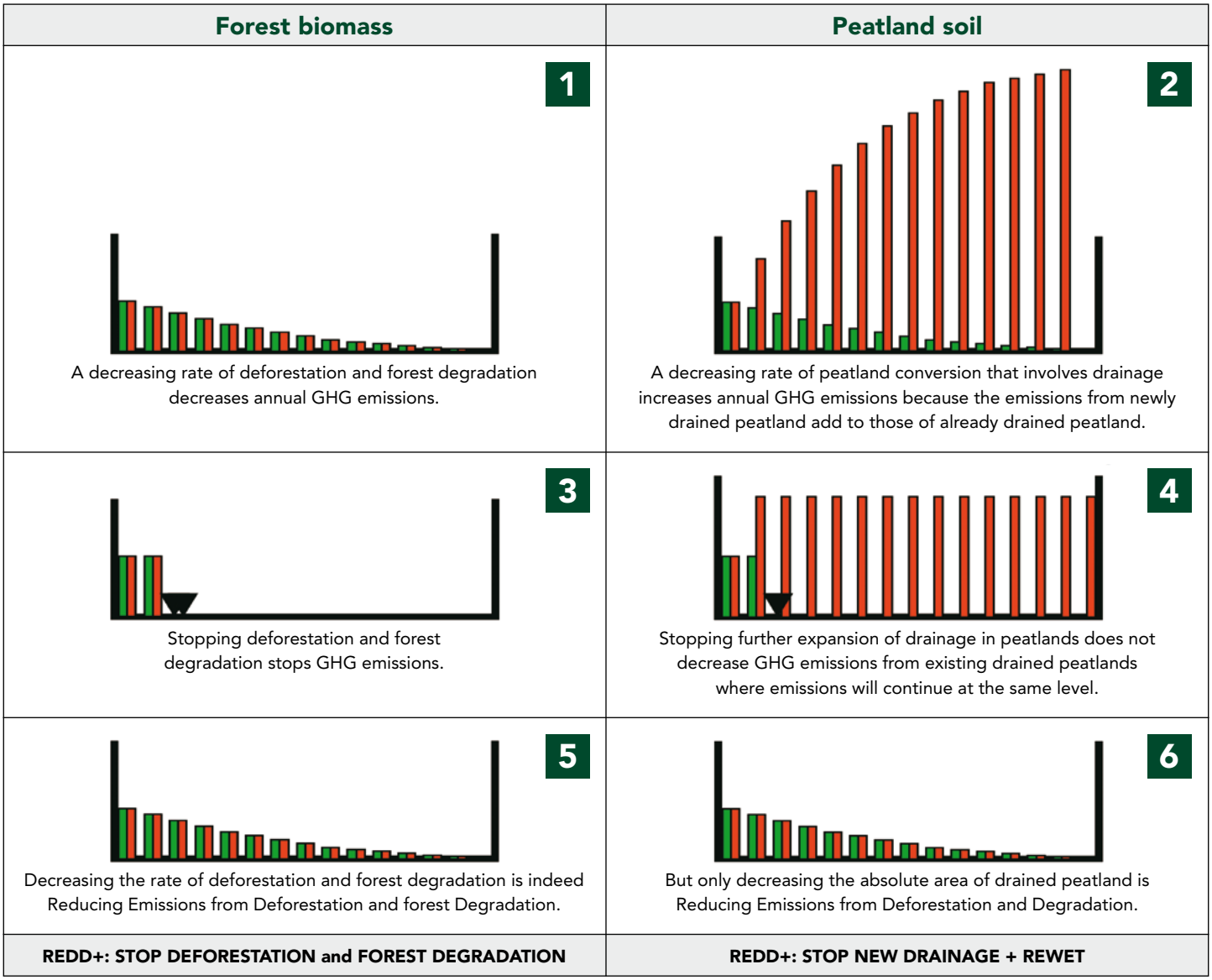

Figure 1. *The relation between annual land use change ([1]-[5]) / land use ([6]) (ha/year, green) and total annual emissions (ton of CO2 eq./year, red) when considering forest biomass only (left) and when considering peat soil (right).*

THE TERRESTRIAL CARBON DEBATE MUST FOCUS ON DEGRADATION IN ALL ITS FORMS

Too often 'deforestation' is used lazily such that it is unclear whether the term is being used as shorthand to refer to 'deforestation and forest degradation' or to explicitly exclude other forms of forest degradation from consideration. In 2007 the Bali COP decided to include 'reducing emissions from deforestation and forest degradation' in the Bali Action Plan — the second 'D' in REDD. Parties thus have an obligation to ensure that 'forest degradation', in its widest sense, is given equal methodological treatment to 'deforestation'.

Obviously, it is simpler and easier to merely drive policy on the basis of reports or estimates of deforestation, but to promote the idea that it should be used as the interim, quick and dirty, basis for introducing a REDD+ mechanism would set back the cause of harmonising carbon and forest conservation policies by a decade.

Of immediate concern is that any moves to limit reference levels to 'deforestation' while excluding 'forest degradation' (which obviously includes 'deforestation' as an extreme form of degradation) would exclude opportunities to report and account for carbon stock losses or emissions from forest degradation that do not involve deforestation. This has two serious problems:

• Firstly, deforestation is often the eventual result of a long and complex chain of degrading activities (such as logging, road-building, grazing, arson). Therefore, regardless of measures taken to directly limit deforestation (such as preventing conversion of forests to cropping land or pasture) if these degrading activities are not directly controlled, deforestation may eventually result;

• Secondly, forest degradation is often a major cause of carbon store reduction and a major source of emissions in its own right, and directly controlling such degrading activities is warranted in seeking to reduce emissions or maintain carbon stocks. The key degrading activity is obviously industrial-scale logging — a major source of emissions that need not directly cause deforestation. Industrial demand for wood is the principal driver of such forest degradation. A consequential problem that would arise from failure to develop methodologies that deal with such forest degradation is that this would frustrate attempts to address commodity wood demand as a driver of emissions and carbon stock losses from forests. Additionally, in the case of forests on peat soils, addressing deforestation only would fail to deal with emissions related to the drainage of organic peat soils for activities such as small-holder agriculture and industrial plantations, which are, in the tropics, the most substantial and most rapidly growing sources of peatland emissions. If these degraded areas are excluded from the REDD+ baseline, emissions will continue and increase without any incentive to reduce them. Moreover, new plantations will then preferentially move to deforested and abandoned peatlands leading to intensified (deeper and denser) drainage and larger, but unaccounted for, emissions (displacement of emissions or leakage). It is critical that the emissions from all peat forest soils are included in the baseline of REDD+, both of currently forested and previously deforested peat soils. We recommend that UNFCCC makes this explicit in its guidance for REDD+. Although currently without canopy cover, deforested and abandoned peat swamps are nevertheless 'temporarily unstocked as a result of human intervention' (see definition of "Forest" in the Annex to decision 16/CMP.1) and can naturally regenerate to forests in the absence of human management and anthropogenic fires.

The broadening of the Coalition of Rainforest Nation's 'RED' proposal (explicitly avoiding accountability for what happens within forests) to 'REDD' in Bali remains an historic step forward — it is not an historical curiosity to be put behind us as if it were an unfortunate anomaly.

Any attempt to limit consideration of the broad and complex field of forest degradation to the single extreme form of 'deforestation' can be expected to lead to perverse outcomes, as it turns a blind eye to the degrading effects of all those forest management activities that do not lead to 'deforestation' — including the conversion of native forests to plantations managed for production of wood or other products. This should be regarded as an unconscionable simplification.

HOW A COMPENSATION BASELINE MIGHT BE DERIVED

We support development of a fair formula for converting a reference emission level or reference carbon stock level into compensation baselines that realistically recognise the different development status of the countries and communities involved. In all situations, however, we feel that it is important that 'compensation' must be seen to be explicitly linked to and constrained by verifiable, scientifically credible reports of estimates of emissions reduced or emissions avoided based on methodologies that clearly, credibly and comprehensively link measurements of environmental variables to emissions estimates.

To allow a compensation baseline to be constructed which allows benefits to be received even when emissions have increased is perverse and should be regarded as unacceptable. That things are not as bad as they might have been is not good enough! The pair of graphs in Figure 2, overleaf, illustrates this potential for perverse outcomes when it comes to treatment of 'reduced impact logging' (RIL) or any other form of logging short of clearfelling.

A compensation level would preferably be based on the extent to which the land base of countries, or of sub-national provinces, have been degraded below carbon carrying capacity (CCC — the carbon store expected in an undegraded landscape). This is most important when considering the appropriate land use policy response. In general, low degradation jurisdictions need to be assisted along alternative development paths that avoid further degradation while high degradation jurisdictions need help in restoring carbon density while delivering other development outcomes, and all variants and combinations in between.

Thus, while an estimate of changes in carbon stores or rates of emissions is needed to identify the overall scale of atmospheric benefit to drive potential compensation, the nature and scale of appropriate compensation should be related to the overall degree of degradation (current carbon stock level relative to original CCC).

FOREST TRANSITION CURVES — SEEING IS BELIEVING

In 2007, the World Bank published a working paper by Arild Angelsen on *'Forest Cover Change in Space and Time — combining the von Thünen and forest transition theories'*[1]. This paper asserts a relationship between 'forest cover' and 'time' commonly referred to as a forest transition curve (see figure below). In essence, 'frontier' development triggers loss of 'undisturbed' forests while 'reinforcing loops' facilitate further and faster forest loss until 'stabilising loops' slow the rate of loss as a 'forest/agriculture mosaic' land use pattern is established from which forest cover then begins to increase again as 'plantations' are added to the mozaic.

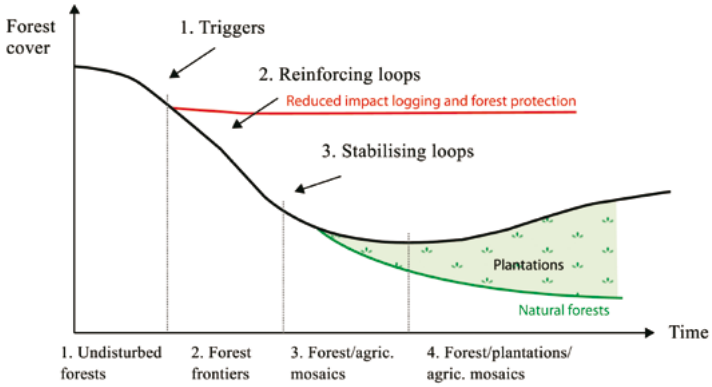

Figure 2. *The original Angelsen forest transition curve modified to reveal conversion to plantations and to indicate possible effect of introducing Reduced Impact Logging or more Forest Protection.*

Note that we have modified Angelsen's curve by indicating the substitution of declining native forest cover for increasing planted forest cover. The important point to make here is that there are no economic fundamentals of development that drive maintenance, let alone recovery, of natural forest cover — quite the opposite. For as long as 'forest cover' (or 'deforestation') is used as the primary indicator and the definition of 'forest' includes plantations, the extraordinary losses of biodiversity value, carbon storage and wood resource associated with degradation are shielded from public policy attention.

We have additionally modified Angelsen's curve by adding a new curve at an earlier point of departure and a higher stabilisiation level . If 'forest cover' is the indicator, this line is the same for 'reduced impact logging' (RIL) regimes and for any regime to protect mature, intact, oldgrowth forest — irrespective of the wildly different degradation signatures of such a range of possible forest management regimes. To allow such losses of value to be 'seen' by policy-makers, 'forest degradation' of some policy-relevant forest characteristic has to be used as the primary indicator — which, for UNFCCC purposes, is carbon store size.

The failure to consider that loss of forest cover (deforestation) occurs in the wider context of forest degradation renders it of limited utility for advancing contemporary UNFCCC policy discussions for REDD+, as established by the 2007 Bali Action Plan,. Thankfully, Angelsen, himself, is at pains to point out that, among the suite of simplifying assumptions that he makes, he *"treat(s) forest as one category which is — admittedly — a big simplification"* (his emphasis, p.8). This simplification has three serious problems for carbon policy-makers (and those concerned for a broad suite of linked environmental, social and economic values of forests):

- **Degradation** of many values of forests without involving loss of forest cover (as defined by FAO), especially by logging, is ignored (allowing loss of carbon, biodiversity, wood and a suite of other values to escape scrutiny);

- **Conversion** of natural forests to plantations is ignored (allowing FAO's broad definition of 'forest' to hide ongoing loss of natural forests as planted forests are established in their stead — while this may be 'sustainable' for wood supply purposes, it is obviously not for any other use or value of a natural forest); and

- **Leakage** (drivers from outside the locality or country) is ignored in presenting change over time as an orderly, sigmoidal curve driven by changing local or national development patterns (exposure to global commodity markets do not allow for such laconic development strategies — the sudden and unpredicatable arrival of global commercial interest triggers a sudden and disorderly collapse).

In essence, all Angelsen is recording is the propensity for economies to over-exploit 'free' wood resources from natural forests and then establish 'costly' plantations to maintain supply as rising demand elevates prices relative to agricultural prices sufficiently to justify it. Much the same pattern of human behaviour can be observed in the rise of fish farms/aquaculture to substitute for declining wild-capture fisheries — or a host of other characteristics of developing economies and societies. Angelsen claims that his curves are different from Kuznets' 'environmental Kuznets curves' (see figure 3) but this is actually not true — while Angelsen uses 'time' on the x-axis of his graph as a surrogate for 'level of development', Kuznets uses 'income per capita' — as a different surrogate for exactly the same developmental phenomenon. If you were to transpose Kuznets' rate of environmental degradation bellshaped curve into a sigmoidal extent of environmental degradation, it would look remarkably similar to Angelsen's.

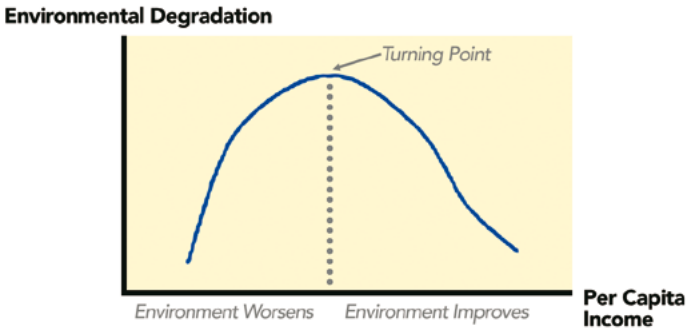

Figure 3. *The environmental Kuznets curve.*

While strategies aimed at increasing the relative rental value of natural forests (*vis á vis* agriculture), by maintaining their wood value for instance, may be of some utility in reducing rates and extent of forest cover loss, they actually exacerbate the loss of biodiversity and carbon value (and most other ecosystem services) of intact forest, especially where natural and planted forests are not differentiated. To be efficient and effective as instruments of climate change mitigation, such strategies need to actually protect terrestrial carbon stores rather than merely slow their rate of degradation.

This change in perspective can be neatly illustrated by changing the labelling of the y-axis on the Angelsen's forest transition curve from 'forest cover' to 'forest carbon store size'. This is illustrated in the diagram following.

[1] Anglesen, A. 2007. Forest Cover Change in Space and Time: Combining the von Thunen and Forest Transition Theories. *World Bank Policy Research Working Paper 4117* (February).

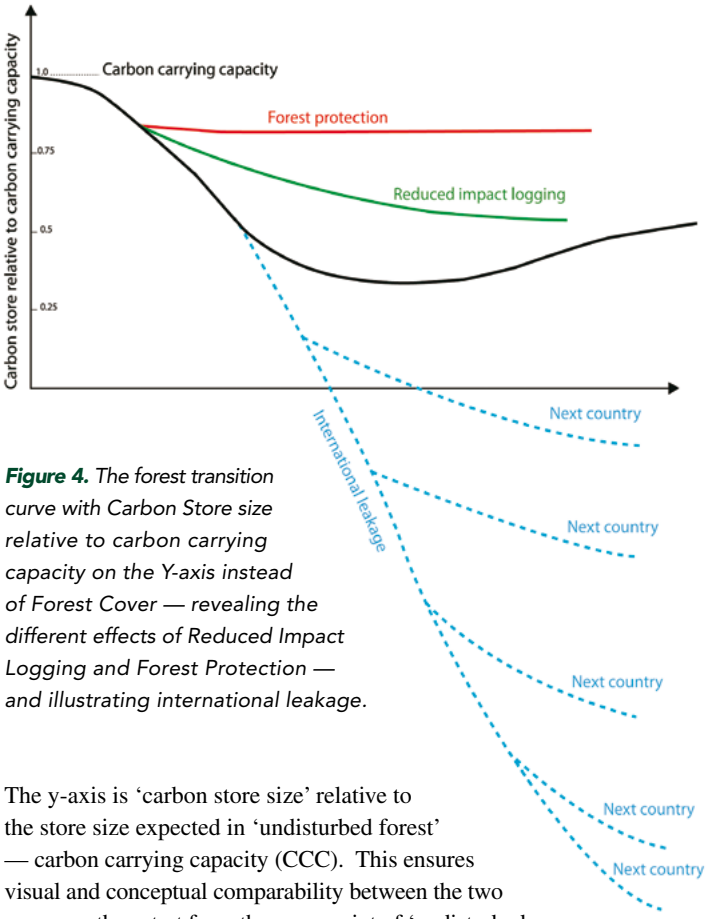

Figure 4. *The forest transition curve with Carbon Store size relative to carbon carrying capacity on the Y-axis instead of Forest Cover — revealing the different effects of Reduced Impact Logging and Forest Protection — and illustrating international leakage.*

The y-axis is 'carbon store size' relative to the store size expected in 'undisturbed forest' — carbon carrying capacity (CCC). This ensures visual and conceptual comparability between the two curves as they start from the same point of 'undisturbed forest' — as well a being the appropriate perspective to take when considering the role of forest management in climate change policy.

The critical difference is that the 'reduced impact logging' (RIL) line is no longer the same as the 'forest protection' line. It can now be clearly seen that RIL is a form of degradation that delivers an inefficient policy outcome from a climate change mitigation perspective — emissions may be reduced compared to business as usual but they are not eliminated as is the case for forest protection. Visually, it is now clear that protecting natural forests can deliver quicker and bigger emissions savings than any other management option (while also protecting that suite of other uses and values of maintaining remaining natural forests as we find them).

International Leakage — what to do about it?

Note also that we have added a suite of dotted-line curves below the modified Angelsen curve. These are intended to illustrate the leakage problem. Underlying, globalised demand for natural resources (both for land and wood) will simply displace supply from a landscape in transition to which policy controls are applied at a property, provincial or national level to others that are not so effectively controlled by such policy settings. This is a process that can be, and is being, endlessly repeated across the forested landscapes of the world — unless something is done about it!

Tuvalu has suggested that some kind of international reference level is needed to deal with this international leakage problem. Our suggestion is that a suite of international reference levels should be built around identifiable international drivers of forest degradation (including deforestation). The Cancun COP decision on REDD+ establishes an obligation on the part of all countries to address drivers of deforestation and forest degradation.

Developing countries have already begun reporting on drivers that operate within their national jurisdictions but dealing with the international component of such drivers remains unfinished business. Developed countries that are largely responsible for trade-related drivers — which is the overwhelming majority of the drivers problem — have, as yet, no equivalent obligation. This is manifestly unfair.

The trade in wood and wood products derived from tropical forest degradation might be used as the basis for a leakage reference level, for example. Each importing country might have an individual commitment to reduce its demand for such products and so reduce its contribution to international leakage. Importing countries might also have a collective global leakage reduction target imposed upon them — much like target setting under the Kyoto Protocol.

Creation of such a leakage reduction mechanism would create a powerful incentive to develop methodologies to transpose reported product trade flows into estimates of greenhouse gas emissions for reporting purposes. The product chain of custody systems needed to provide for it are already widely used in a number of industry supply chains to support a wide array of accreditation and certification systems.

In this particular instance, an appropriate international body — the ITTO (International Tropical Timber Organisation) — already exists. It could be asked to establish and operate such a leakage reduction scheme much as the IMO (International Maritime Organisation) is doing for international shipping while ICAO (International Civil Aviation Organisation) talks about doing for international airlines. ITTO's mandate covers orderly trade in tropical timber products and has recently been modified to strengthen its mandate to support sustainable management of forests. UNFCCC could ask ITTO for its assistance in running a scheme aimed at helping maintain forest carbon, and ITTO should be well placed to make such a contribution to the shared global goal of avoiding dangerous climate change.

One of the interesting opportunities arising from taking this approach to addressing international leakage of emissions from forest degradation is that success by developed countries in reducing drivers of forest degradation in developing countries could be used as an eligibility criterion for participation in a REDD+ market mechanism. That is to say, developed countries would have to be able to demonstrate a commitment to fixing the drivers problem at home before seeking to fix the associated degradation problem abroad. This would fix the *'do as I say not as I do'* problem that currently besets development of a REDD+ mechanism — where on the one hand developed country taxpayers are to support their government in spending money on REDD+, ostensibly to save forests in developing countries, while on the other hand, as consumers, they are spending money to drive degradation of the very same forests.

Similar leakage reference level arrangements could be developed for a suite of other international drivers of forest degradation, especially rapidly expanding agricultural and energy crops, like corn, soya beans and palm oil. Where there is no suitable existing intergovernmental international forum, like ITTO for tropical timber trade, an arrangement might be needed to appropriately recognise trade associations, roundtables or other suitable commercial or community institutions. Ultimately, however, it will be for UNFCCC member governments to formally endorse the targets and mechanisms that others might develop at the UNFCCC's behest.

A WORKABLE FRAMEWORK FOR CATEGORISING DEFORESTATION AND FOREST DEGRADATION ACTIVITIES

The five categories of eligible activities included in decision 1/CP.16 (for reducing emissions from deforestation, and from forest degradation; conservation of carbon stocks, sustainable management of forests and enhancement of carbon stocks) can be usefully harmonised with the FAO categories that countries are using for their 2010 Forest Resource Assessment as follows:

	Primary forest	**Other naturally regenerated forest**	**Planted forest**	**Other land uses**
Primary forest	Conservation of carbon stocks	Forest degradation	Forest degradation (safeguard exclusion)	Deforestation (safeguard exclusion)
Other naturally regenerated forest	Enhancement of carbon stocks	Sustainable management of forest	Forest degradation (safeguard exclusion)	Deforestation (safeguard exclusion)
Planted forest	Enhancement of carbon stocks	Enhancement of carbon stocks	Sustainable management of forest	Deforestation (safeguard exclusion)
Other land uses	Enhancement of carbon stocks — afforestation	Enhancement of carbon stocks — afforestation	Enhancement of carbon stocks — afforestation	Not applicable

A MODIFIED MATRIX CAN BE USED FOR PEAT/SWAMP FORESTS

	Primary/restored peatswamp natural forest	**Degraded peatswamp natural forest**	**Planted forest**	**Other land use**
Primary/restored peatswamp forest	Conservation	Degradation	Deforestation and degradation (safeguard exclusion)	Deforestation (safeguard exclusion)
Degraded peatswamp forest	Enhancement of carbon stocks	Degradation	Deforestation and degradation (safeguard exclusion)	Deforestation (safeguard exclusion)
Planted forest	Enhancement of carbon stocks	Degradation	Degradation	Deforestation (safeguard exclusion)
Other land use	Enhancement of carbon stocks	Degradation	Degradation	Degradation

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