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Making REDD+ Real: Guiding Principles and Operational Framework for Tropical Forest Carbon

Copenhagen presents us a vital window of opportunity to centre-stage land-use change and its impact on terrestrial carbon storage, and to move governments towards agreement for material mitigation of the 35% of global emissions which arise from farming and from forest losses.

There is increasing evidence that a mitigation regime that only values fossil and industrial carbon incentivizes the use of bio-energy, and along with that, increases pressures on conversion from forests and croplands, with a risk of increasing deforestation emissions as well as food prices.[1] Furthermore, extensive deforestation and forest degradation in tropical forests has turned a natural sink (estimated absorptions 2.9-5.9 GtC per annum[2]) into a large source of emissions. Together with the human welfare losses and ecological scarcities caused by tropical deforestation, these factors point to the urgent need for a forest carbon agreement, whereby, all parties collectively aim at halting forest cover loss in developing countries by 2030 and reducing gross deforestation in developing countries by at least 50 percent by 2020 compared to current levels.

1. Purpose of this document

The purpose of this document is to lay out the guiding principles and operational framework for a proposed global agreement , focusing on tropical forests and developing countries[3] ,which rewards reduced deforestation and forest degradation (i.e. REDD), afforestation, reforestation, and forest conservation (i.e. REDD-Plus) that lead to enhancement of forest carbon stocks. Our goal is to inform the international discussion on this topic *well before* Copenhagen, Dec 2009, so that Copenhagen becomes a substantive step in the establishment of a REDD-Plus

[1] Nine studies are cited which point in this direction in Annexure 1.
[2] S. Lewis and L. White, *Nature,* Feb 2009.
[3] See Annexure 3 for a discussion on the special significance of tropical forests in terrestrial carbon storage and global CO2 mitigation.

agreement. We base our recommendations on the content of the revised negotiating text prepared for UNFCCC's forthcoming meeting at Copenhagen, December 2009, and referred to as FCCC/*AWGLCA/2009/INF.2* dated 15th Sep 2009.

To ensure that the REDD-Plus mechanism shall be effective, results-based, flexible, dynamic and incentive driven [*paragraph 106.1 in FCCC/AWGLCA/ 2009/INF.2*], the structure outlined here favours the adoption of a three-phased approach, similar to that described in a recent options assessment report prepared by Meridian Institute for the Government of Norway. This document proposes and describes workable mechanics of each of these three phases, in terms of key open ended issues. Thus, we propose and describe the nature and structure of funds in the 'fund' phase; the nature of the regime and market in the 'market' phase ; the need for an adjunct market for the "Premium" attracted by biodiversity, community and ecosystem service co-benefits ; the nature and workable mechanics of reference levels set at each phase of the scheme ; the nature of the "three-tier" participation (community/ landowner, local government, national government) and "nested" scheme that is needed for this to work ; and the criteria for eligibility at project and country level, both for donor countries and developing countries.

Acronyms

FC: Forest Carbon
FC–NSAP: Forest Carbon National Strategy and Action Plan
FC-ERC: Forest Carbon Emission Reduction Certificate
FC-ERC-P: Premium Forest carbon Emission Reduction Certificate
TFC: Tropical Forest Carbon

2. Scope

We have argued in this paper [4]that there is an urgent need for a "green carbon"[5] or terrestrial carbon regime to be put in place, to accompany the current Kyoto regime and its associated markets (eg: EU-ETS) which still constitute largely a "brown carbon"[6] regime. The scope of our proposal is two sub-regimes for the new Protocol, to include both terrestrial emissions ("green carbon") and energy and industrial emissions of CO2 ("brown carbon") and other GHG's respectively. The

[4] See Annexure 1
[5] See Annexure 4 , "Colours of Carbon" from the TEEB Climate Issues Update, September 2009.
[6] ibid

first scheme to be set up within the "green carbon" sub-regime is Tropical Forest Carbon, in the form of REDD-Plus, as defined below. Our proposal is for a terrestrial carbon contract which is not fungible with industrial carbon (see Annexure 2), but we propose that so-called "Annex 1 "countries that fund REDD-Plus activities in developing countries can offset (to be decided) between 30% - 35% of their annual emissions reductions by buying "green carbon" offsets. We suggest that unutilized "green carbon" offset quotas can be carried forward into later years. The entire regime should be reviewed in 2020, based on global performance on forestry emissions, on new schemes mooted for terrestrial carbon (eg: agricultural schemes). This overall approach and design would enable donor nations to meet their offset demand in green carbon through those countries that meet country eligibility criteria (outlined in section 6.2) and have established FC-NSAP by Phase 2. We suggest that Phase 2 (fund phase) should be available from 2012 onwards, for those which meet eligibility criteria, and Phase 3 (market phase) should be available from 2015. ERC's generated from forest carbon would be tradeable in the FC-ERC compliance markets, stripped premiums in FC-ERC-P (Premium) markets from 2015.

We see Tropical Forests as the priority arena for starting the "green carbon" regime – because if its high performance and potential as a land-based mitigation engine akready capturing an estimated 4.8 Gt CO2, because of the high deforestation (largely tropical forests) which comprises 20% of CO2 emissions, and because of the attendant social and ecological benefits as tropical forests are mostly in developing countries (see Annexure 3).

As mentioned in the FCCC/AWGLCA/2009/INF.2 Alternative/Addition 1, Alternative 2 and Alternative 3, it is recommended in this document that the purpose of REDD-Plus is to assist developing countries in:

a. Contributing to the objective in Article 2 of the Convention;
b. Enhancing efforts to achieve sustainable development goals through their nationally appropriate mitigation strategies;
c. Meeting their commitments under the Convention and related international agreements;
d. Conserving biological diversity and combating desertification;
e. Developing comprehensive land-use inventories and monitoring frameworks;
f. Developing robust national carbon monitoring and accounting systems that are subject to review and;
g. Establishing national forest emissions levels, which take account of national circumstances, and that are agreed by the COP based on independent expert advice.

It is critical that a forest carbon agreement post-Kyoto also adopts a framework to ensure that multiple benefits are generated for livelihoods, biodiversity and

ecosystems through avoided deforestation and degradation projects that are implemented.
As described in section 3.4 below, the REDD-Plus operational framework proposed here favours the adoption of quality standards and standard international ratings which reflect an eligible Forest Carbon project's ability to achieve other ecosystem benefits (livelihood support, freshwater enhancement, biodiversity conservation, and other so-called "co-benefits") and allow a privately traded market to evolve in which the monetary "premium" from a project's ecosystem service values can be stripped and sold by the project's owners to a willing marketplace of international aid, philanthropic, CSR, and trading interests.

We note in this section the scope of this "green carbon" regime and its eligible activities,

2.1 Terrestrial Carbon

It is essential that the eventual scope of an effective agreement is **"Terrestrial Carbon"** as a whole**.** This is because natural areas, plantation forests, agricultural lands and pasture lands can all perform carbon sequestration and storage functions to varying degrees at various stages of their life-cycles, and land use change from one to the other needs to be managed to several objectives including emissions mitigation.

2.2 Tropical Forest Carbon

Deforestation and forest degradation cause one-fifth of our current CO2 emissions. Land use change from natural areas to human habitation and agricultural use thus, needs to be addressed with urgency in many parts of the world where ecosystem degradation and biodiversity losses are severe, damaging to human welfare, and potentially irreversible. It is noted (see Annexure-3, & references) that this is particularly the case in tropical forests, most of which are in developing countries. This leads to the immediate focus on **"Tropical Forest Carbon",** a sub-set of Terrestrial Carbon. It is noted and agreed that geographical areas covered in some instances extend beyond the tropics where justified by contiguity, sovereignty, ecosystem types, and observed deforestation pressures.

2.3 Activities in Scope

Which activities to reward through a Tropical Forest Carbon agreement is a critical success factor. It also has ethical implications, as some developing nations have been 'early movers' in good conservation and that should be recognized, in addition to recognizing and rewarding lower deforestation and degradation. Furthermore,

perverse economic incentives may arise from rewarding "reduced bad behaviour" but not rewarding "good behaviour" in the form of effective conservation.

The operational REDD-Plus framework outlined here integrates the fact that measuring and managing the effectiveness of conservation is an important component of a Tropical Forest Carbon agreement, in addition to measuring and managing baseline-referenced reductions in deforestation and forest degradation.

In-scope activities are therefore agreed as follows,

(a) Reduced Emissions from Deforestation, set and measured against an appropriate Reference Level,
(b) Reduced Emissions from Forest Degradation, set and measured as in (a) above,
(c) Carbon sequestration through afforestation in agricultural zoned land, fallow lands and waste lands, and restoration of degraded forest land,
(d) Improvements in Conservation Effectiveness and Ecological Restoration (three eligible outputs: measurable improvements in ecological services (eg. freshwater capacity, Protected Areas), in biodiversity (eg. threatened species) and in community engagement (eg. enhancing livelihoods without impairing conservation).

Since effective conservation is generally observed in countries on the path to improved forest governance, rewarding this "good behaviour" in Phases 1 and 2 is vital both from an ethical perspective and to ensure that REDD-Plus, does not create perverse incentives.

3. Phasing

Phase 1 constitutes capacity building in REDD-Plus developing countries and the beginning of national REDD-plus strategy development [*refer to paragraph 106.1 in FCCC/AWGLCA/2009/INF.2*] in the form of Forest Carbon National Strategy Action Plans (FC-NSAPs) with support from Annex I governments and institutions such as the World Bank Forest Carbon Partnership Facility and UN-REDD.

Phase 2 involves implementation of national REDD-plus policies and measures in combination with compensation for results based emission reductions and removals from the forestry sector [*paragraph 106.1 in FCCC/AWGLCA/2009/INF.2*].

Within Phase 2, a second component is an international Fund set up under the UNFCCC to facilitate REDD-Plus implementation [*refer to paragraph 113 Option 1 and Option 2 in FCCC/AWGLCA/2009/INF.2 and paragraph 127 Option 3 in FCCC/AWGLCA/2009/INF.1*] and to leverage global willingness to pay, support technology transfer, policy implementation and institutional arrangements, scaling

up of demonstration activities, MRV [*paragraph* 113 *in FCCC/AWGLCA/2009/INF.2*] and to aggregate and develop a critical mass of eligible REDD-Plus projects.

Phase 3 is a results-based compensation mechanism in the form of a cap and trade compliance market for fully measured, reported and verified emission reductions and removals from the whole forestry sector [*paragraph 106.1 in FCCC/AWGLCA/2009/INF.2*]. We further recommend that Phase 3 includes an adjunct "Premium" market that rewards measured, reported and verified benefits in livelihoods, biodiversity and ecological services resulting from emission reductions and removals activities above from the whole forestry sector.

3.1 Rationale for Phasing

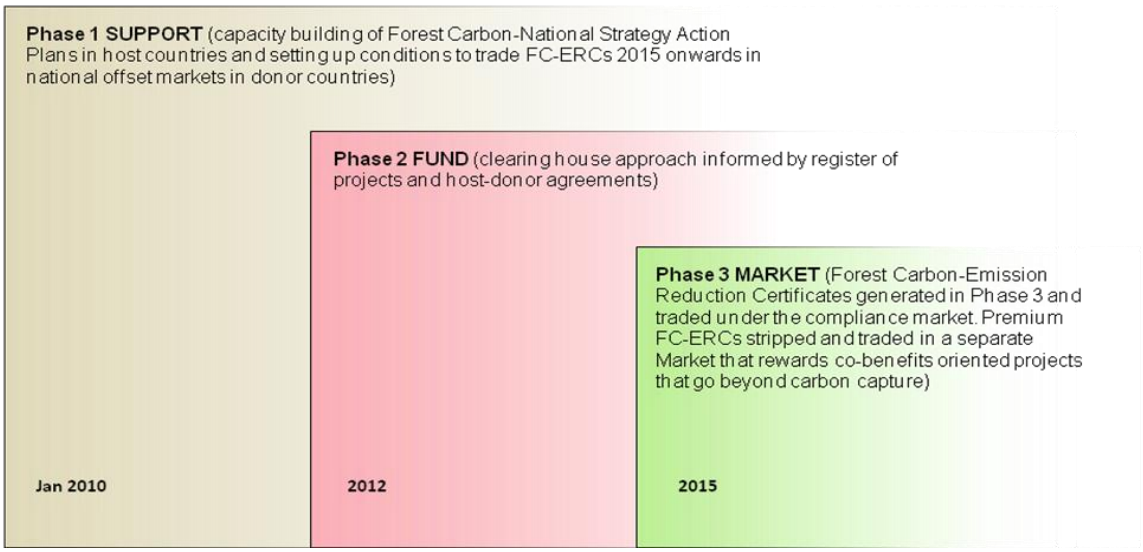
There has been considerable debate on the relative merits of "fund" versus "market" approaches, but most of this debate has missed the point that these can be two mutually reinforcing approaches, if properly sequenced and structured.

Secondly, given the technical, legal, operational, and governance complexities of forest carbon, it is vital that careful preparation and capacity building precedes any fund or market based mechanism.

This REDD-Plus proposal therefore, favours the adoption of a three-phased approach, similar to that described in a recent options assessment report prepared by Meridian Institute for the Government of Norway[7]. This approach optimizes (during Phase 1) ongoing and diverse 'REDD' and 'Forest Carbon' initiatives to prepare the ground for a tropical forest carbon mechanism, by incentivizing in country conditions through core capacity building and national REDD-Plus strategy development [*paragraph 106.1 in FCCC/AWGLCA/2009/INF.2*] in the form of FC-NSAPs that create eligible projects. In Phase 2, which is similar to the Amazon Fund proposed by Brazil, it leverages global willingness to pay through a fund mechanism to facilitate REDD-Plus implementation [*refer to paragraph 113 Option 1 and Option 2 in FCCC/AWGLCA/2009/INF.2*], and also aggregates and develops a critical mass of eligible and performing projects which can later issue tradable certificates of emissions reductions (FC-ERC) in Phase 3 which are the underlying instruments for a forest carbon marketplace.

[7] Angelsen, Arild et al, "Reducing Emissions from Deforestation and Forest Degradation (REDD) : An Options Assessment Report", Meridian Institute, March 2009,

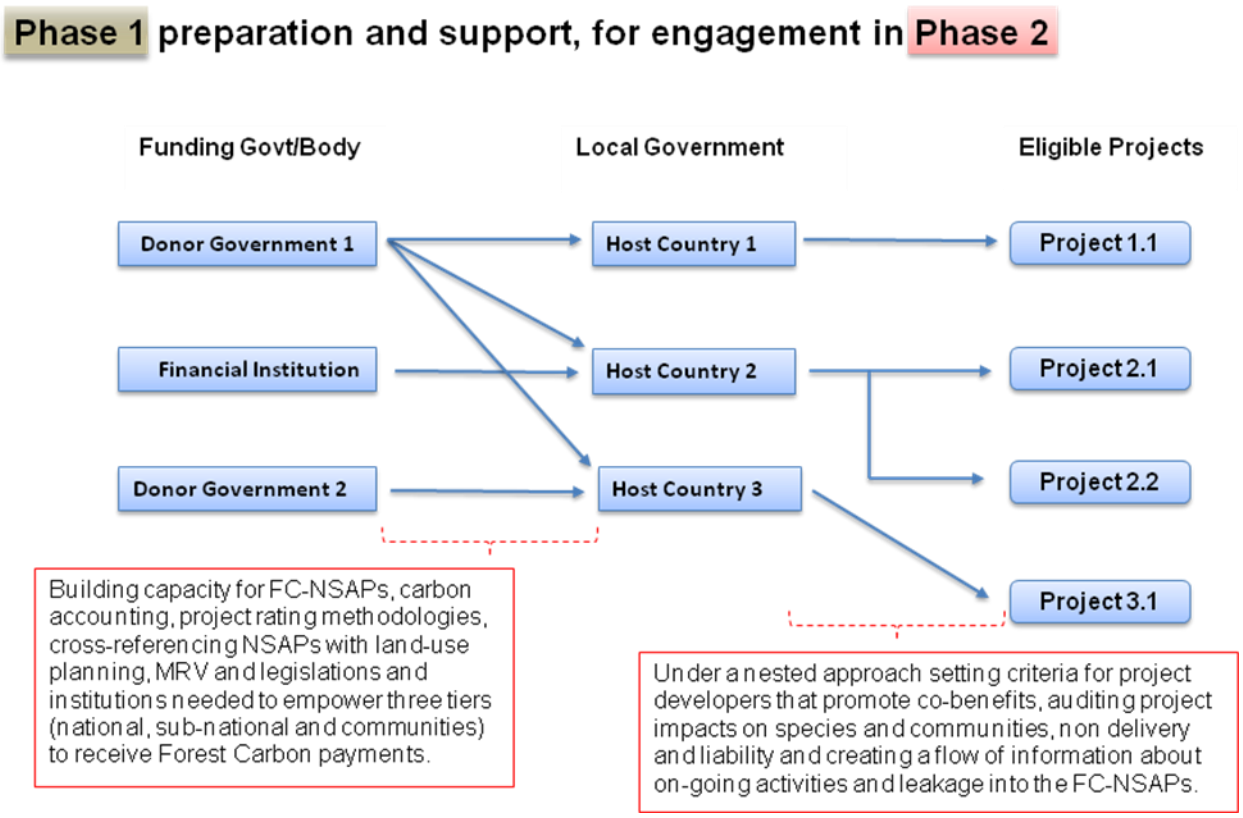
Phases of Forest Carbon



3.2 Phase 1 (Support Instrument) 2010 / Copenhagen onwards

The three main objectives of this phase are to deliver a number of "National Forest Carbon Strategy & Action Plan" (FC-NSAP) documents from first-mover countries, to fund capacity building to run a well governed, MRV bound, legally empowered, "nested" three-tier of beneficiaries approach during Phase 2 in these countries, to establish reference levels and thirdly, to fund a large initial population of demonstration projects such as already proposed and financed by UN-REDD and by the World Bank's Forest Carbon Partnership Facility[*paragraph x.28 in FCCC/AWGLCA/2009/INF.1*].

Such bilateral finance would be guided and encouraged to fund the setting up of appropriate policy frameworks and MRV frameworks that include creating robust national monitoring systems, country level aggregate forest carbon databases to record on going activities and quality of projects and involvement of indigenous peoples and local communities [*refer to paragraphs 119, 120 and 120.1 in FCCC/AWGLCA/2009/INF.2*].



3.3 Phase 2 (Fund Instrument) 2012 onwards

Phase 2 involves implementation of national REDD-plus policies and measures in combination with compensation for proxy-based results for emission reductions and removals from selected forest activities and land use and land-use change categories [*paragraph 106.1 in FCCC/AWGLCA/2009/INF.2*].

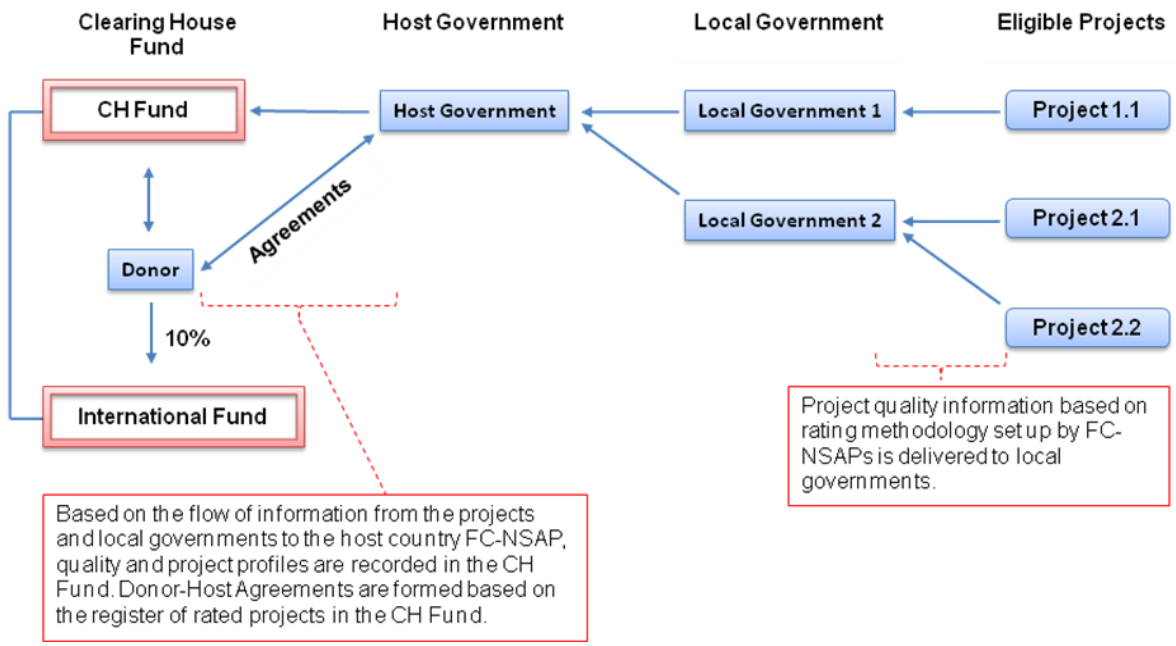
A second component of Phase 2 is an international Fund-based mechanism. A Clearing House approach is envisaged, which centrally registers and monitors all eligible projects which use bilateral funding, as well as an international fund set up simultaneously to supplement bilateral funding.

Phase 1 would already have created in-country institutional readiness (MRV standards, FC databases, project and national accounting standards, "nested approach" and enabling legislation) which would be used to start creating eligible projects in Phase 2. In addition, under Phase 1 those countries that have established reference levels would be able to engage in Phase 2 and begin to negotiate agreements with donor governments through the Fund. Ex ante payments would be negotiated bilaterally by donor and developing governments and be defined by the accepted terms of the agreement between the two parties.

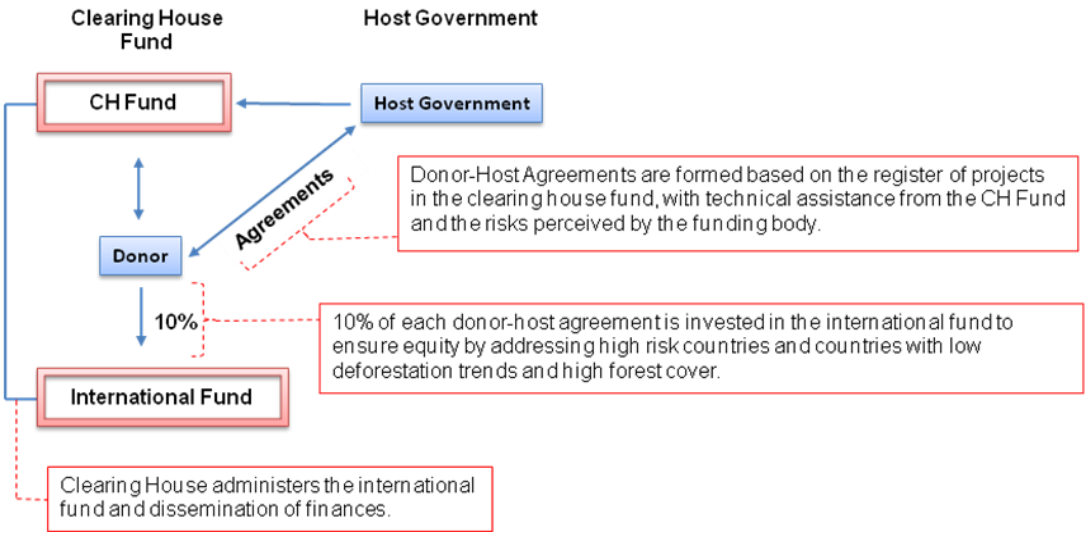
This phase has two main objectives [refer to *paragraphs x.30 and x.31in FCCC/AWGLCA/2009/INF.1*]. The first is to implement country-level forest carbon strategies and plans amongst participating developing countries which have tropical forests. Phase 2 capacity building would include an improved national accounting framework (note : UN-SEEA revision is in progress) to measure and recognize forest biomass and its ecosystem service values, through setting shadow prices for forest carbon capture and other ecosystem services of tropical forests. National and Project Accounts would be consistent, and Performance reports would enable the monetary role of the Fund-based mechanism to be reflected in national accounts. The second objective is to fund a significant population of eligible projects in participating countries whose performance during Phase 2 is measured and rewarded against reference levels, which have been established under Phase 1 and before donor-developing country government agreements are formed in Phase 2.

This document considers a "clearing-house" approach more suitable than a single unified international fund, as it helps better reflect governance concerns and performance risks in project selection through empowering and following individual funders' choices and perceptions of project and country risks.

Phase 2 ("Sell" side) from the project to host country level



Phase 2 ("Sell" side) at the International Clearing House Fund and Donor Level



Firstly, this approach will create a positive bias towards higher quality (lower risk) projects and country frameworks. Such 'market' pressure in search of quality projects is healthy, as it will demonstrate their benefits early, providing models of success for other countries and projects to emulate.

Clearing House Fund structure

1. **Technical Body**

   Prepares Monitoring Reporting and Valuation criteria, project rating methodology, project - local govt. - host agreements, donor – host agreements and national carbon accounting "drafts".

2. **Register of Agreements**

   Records eligible project agreements and emissions targets (country level measured against the baseline) for tradable FC-ERCs in the cap and trade market and FC-ERCs – P to be traded separately (post-2015 generated under Phase 3).

3. **"Originations Support Unit"**

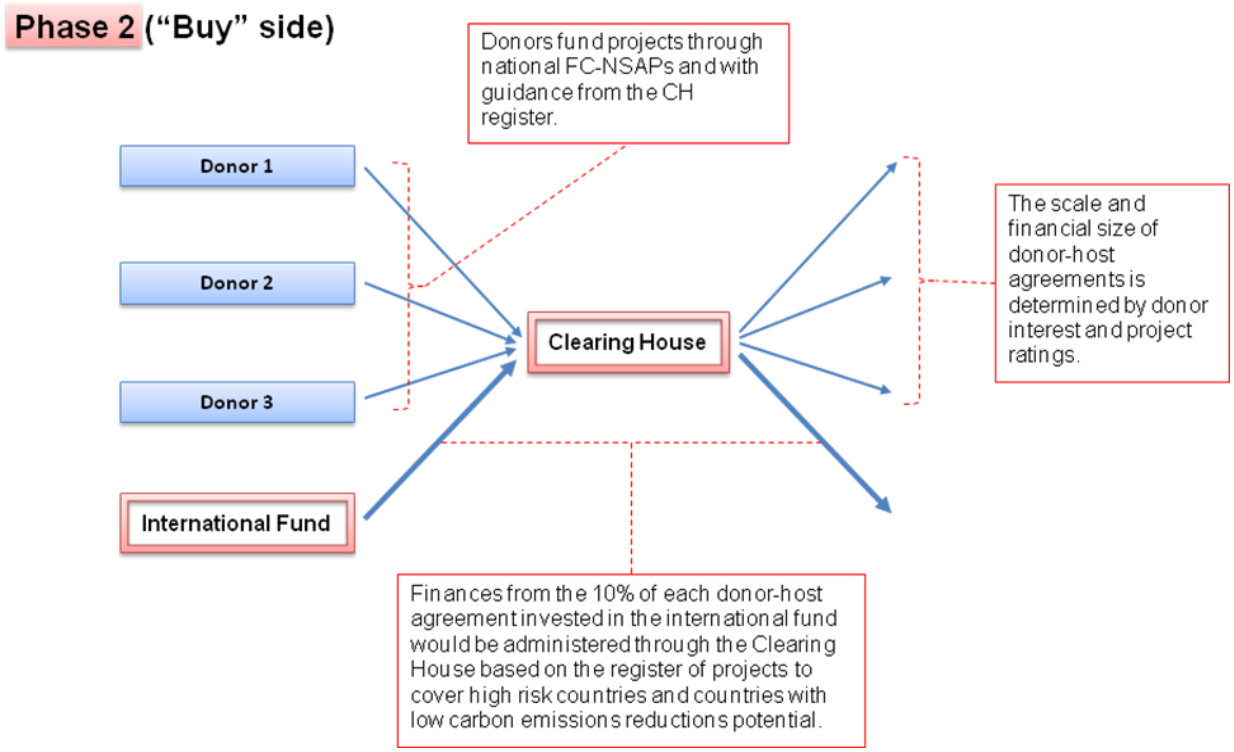
   Records Host country project proposals and quality ratings. Responds to Donor enquiries.

During Phase 1, our preferred approach is to set only "Upper and Lower Bounds" for Reference Levels which are to be negotiated individually at project level, and to let the funder / participant country 'market' evolve further in this controlled manner. Reference Levels will address historic national deforestation and degradation rates, extant forest cover, and per capita income (per capita GDP) and be established before agreements between donor and governments of developing countries can be formed in Phase 2.

For Phase 3, as reference levels need to be set on the basis of a global agreement, global additionality is critical, and trans-boundary leakage would have to be addressed as well through the register of projects recorded in the clearing house which encompasses a monitoring role. Liability and non-delivery requirements would be bilaterally negotiated between the funders and project countries.

The risk of exclusion of late entrants is not considered material, as any early-mover country in fact has a finite forest carbon emissions-reduction potential, which once filled, will direct further demand towards later entrants.

The key is to ensure adequate funding overall, and to move towards emissions reductions targets in Phase 3 (as part of the overall post-Kyoto framework) which are not timid but aggressive, and which address not only the ongoing level of emissions but also, separately, the current global "carbon deficit" implied by a 387 ppm CO2 concentration.



3.4 Phase 3 (Market Instrument) 2015 onwards

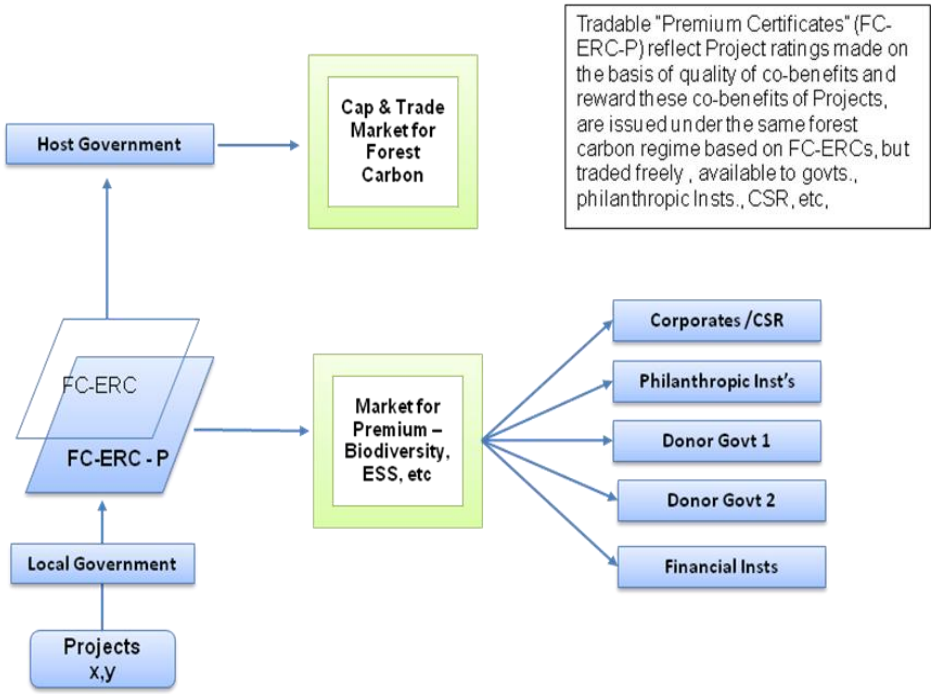
This final phase is a Forest Carbon (FC) Market based on traded Forest Carbon Emissions Reduction Certificates (FC-ERC's) issued by eligible FC projects in participating countries and certified by an appropriate new UN body for tropical forest carbon.

Eligible projects set up during Phase 1 or 2 in countries which have met eligibility criteria to qualify in a GHG mechanism can in principle issue non-tradeable claims on the national Forest Carbon authority (the sole national issuer of FC-ERC's in Phase 3). However, this is only after they have recorded and independently verified (using MRV procedures vetted by the respective UN Forest Carbon authority) emissions reductions against their negotiated reference levels for three years running during Phase 2 (i.e. since Phase 2 begins 2012, the earliest successful movers would be able to issue tradeable certificates in 2015). New projects not commenced in Phase 1 or Phase 2 have to undergo the same 3-year MRV hurdle in order to be registered for issuing FC-ERC's.

Projects set up during Phase 1 or 2 that can issue FC-ERC's in Phase 3 and that generate ecological, socio-economic and biodiversity benefits beyond the carbon capture or carbon emissions reduction in-scope activities (a), (b) and (c) negotiated bilaterally against the baseline, are eligible for Premium internationally accepted rating in recognition of additional benefits, such as freshwater enhancement, improved livelihoods for local forest-dependent poor that do not impair conservation, species protection, etc. For example, a "Gold, Silver or Approved"[8] rating has been devised for exceptional benefits for poor communities and wildlife and improvements in governance – this or a similar rating could qualify a project for Premium graded FC-ERC's. Under this REDD operational framework, it is proposed that Premium FC-ERC's may be stripped and sold independently by eligible projects in the marketplace, to capture investor interests in financing and rewarding multiple benefit projects. This flexibility will gradually help evolve a marketplace in which the "Premium" from an eligible Forest Carbon project's ecosystem service values will be rewarded by a willing community of international aid, philanthropic, CSR, and trading interests. The final beneficiaries will be the local communities/ indigenous peoples who, as responsible project owner-managers, ensured the "Premium" rating.

[8] The Climate, Community and Biodiversity standards, already adopted by several land use climate change mitigation projects specify fourteen required and three optional "Gold level" criteria to determine a projects approved or gold rating based on the extent of simultaneous benefits for sustainable development, poor communities and biodiversity.

Phase 3 (2015…) Adjunct Market for Premium FC-ERCs



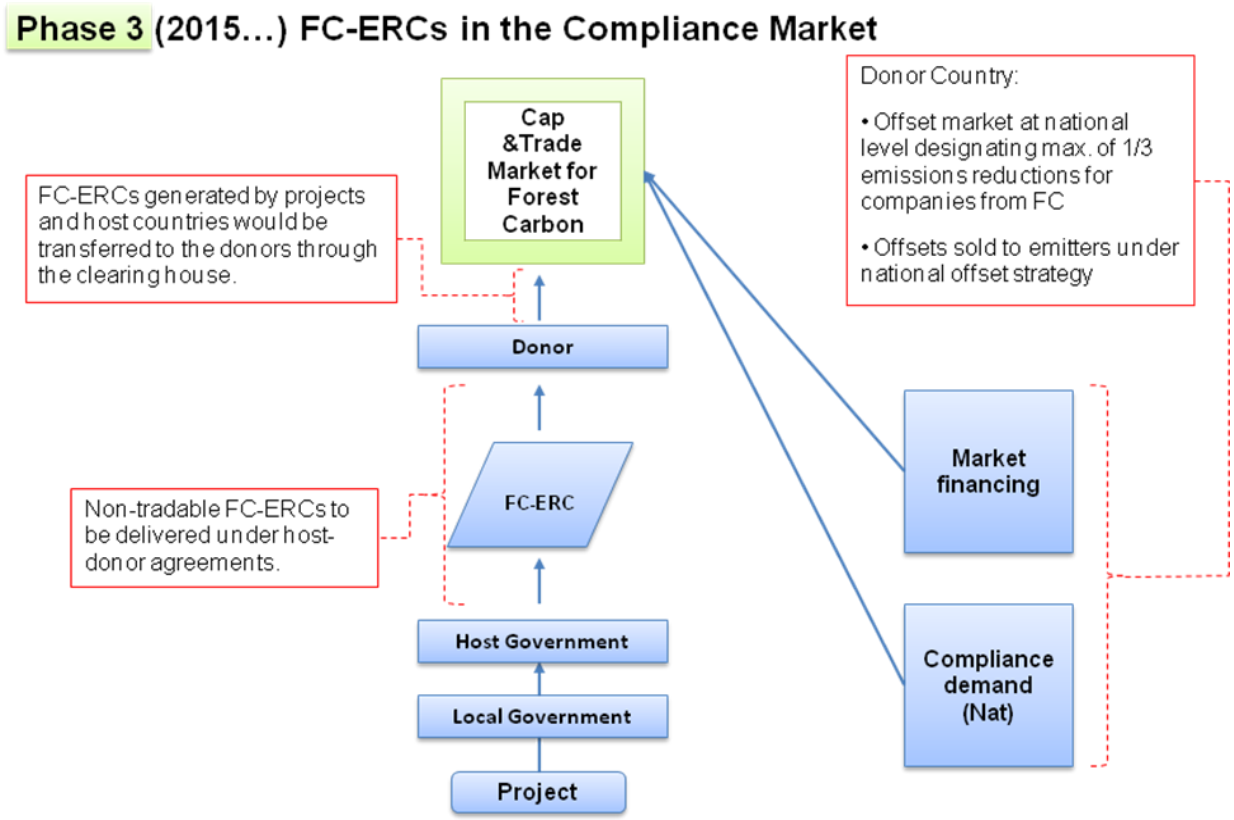
This proposal recommends that this cap and trade FC market will be financed by a large-scale global compliance agreement which is part of the post-Kyoto framework.

The risk of 'flooding' is adequately mitigated by separate targets being set for "brown carbon" (which includes and covers CO2 emissions from industry, energy, transport, etc, and other GHG emissions from industry, etc) as against "green carbon" (which includes all terrestrial carbon, but specifically and to begin with, a regime for Tropical Forest Carbon). Contract fungibility is not an objective of Phase 3, and under the proposed structure it is evident that the success of the FC marketplace does not require it to be.

No strong evidence appears to exist that "leakage" is currently a very serious problem, nor that it cannot be addressed. Protected Areas have been created since decades, but they have not *increased* deforestation. Nevertheless, "leakage" both domestic, cross-border, and indeed sectoral, does remain a concern. By 'sectoral' leakage we mean the ineffectiveness in controlling overall carbon emissions of a regime which is uniquely or largely focused on "brown carbon" (see introduction, p1, and Annexure 1) resulting in an escalation of "green carbon" emissions.

Cross-border leakage and domestic leakage can be addressed most practically by setting reference levels and measuring performance at Country level for FC-ERC issuance, as part of a sectoral 'cap and trade' regime for tropical forest carbon. Not only do national boundaries help insulate and contain deforestation pressures, but also the three-tier, "nested" approach advocated here incentivizes National

governments to ensure good FC governance at State and Project level, so that they do not forever have to bear the financial burden of uncovered rewards going to just a few successful projects and states under their FC-NSAP's.



4. Structure

Structural considerations which are in our opinion the most critical for success are highlighted and discussed here - this section is not a comprehensive inventory of all structural elements of Forest Carbon instruments in each phase.

The proposal considers a "clearing-house" structure for the recommended international fund to be essential for success in Phase 2 (see 4.1 below). This REDD operational proposal also underlines the central importance of local communities towards success of a REDD-Plus agreement, and considers a "Three Tier" and "Nested" Approach (see 4.2) appropriate. Within this third tier, a key beneficiary group in addition to private landowners is indigenous peoples / local communities, who are empowered to be involved in REDD-Plus, afforestation, reforestation and conservation projects.

4.1 Clearing House Fund & "Inclusion Fund" for Phase 2

The proposal considers a "clearing-house" approach more suitable than a single unified international fund, as it helps better reflect governance concerns and performance risks in project selection through empowering and following individual funders' choices and perceptions of project and country risks. There is an element of "moral hazard" if eligibility standards are applied in an overly mechanistic and centralized manner without enough reflection of governance issues and performance risks. Learning from our experience of the Kyoto Clean Development Mechanism, CDM, and its approach which eventually created an unmanageably large number of "approved methodologies" including some which led to perverse outcomes, the proposal suggests retaining the option of greater direct control and choice in allocating funds towards select projects and specific countries during this phase, using a relatively simple and manageable structure.

As a "clearing house" mimics a marketplace to some extent, it will lead to a market tendency to concentrate focus and financing into high quality, i.e., towards countries which have good governance and advanced capacity to deliver - for example, Brazil, Indonesia, India, Mexico . This proposal therefore recommends that the "clearing house" be strengthened in its ability to meet broader social objectives as well as the long –term depth and liquidity objectives of the next (market) phase by creating an international fund of material size administered by the clearing house and which would become just another member of this 'clearing house' of bilateral and multilateral arrangements. Its main purpose will be to better distribute financing for capacity building – not leaving the less advanced developing nations entirely at the mercy of free market allocation. These nations would not normally be as attractive to investors (from either project risk, systemic governance, or political relationship perspectives) as the most advanced and organized among developing / tropical forest nations. This international fund could be referred to as an "Inclusion Fund", as its main purpose in effect is inclusion.

4.2 "Three Tier" Structure and Local Communities / Indigenous Peoples

Considerations of distributional equity, and opportunities for Forest Carbon Strategies and Action Plans to result in new livelihoods for the poor, point to the need for three tiers of beneficiaries for the forest carbon scheme: the sovereign, the state/province occupying the threatened ecosystem, and the private landowners and indigenous / local community stakeholders of forest carbon projects.

It is important not only to design rewards to incentivize local communities and indigenous peoples to seek their collaboration as stakeholders, but also to engage them in the design process for each country's Forest Carbon National Strategy and Action Plan (FC-NSAP). This will be essential not only to emphasize the genuine

spirit of partnership for success in such projects, but also to identify working models for rewards to reach communities as a whole, including the weakest, and not get captured largely by elites. Legal vehicles for such distribution to local communities cannot simplistically be modeled on or transplanted from the developed world, and the knowledge and cooperation of local communities is essential to develop tailored solutions in this regard.

Given that three tiers of beneficiaries are perforce involved, and that success at one level does not necessarily imply success at another, a "Nested Approach"[9] is recommended for Forest Carbon. Accounting and crediting occur at three levels, national, sub-national, and project.

1. National level: Country governments are recipients of credits for emission reductions below negotiated targets (reference levels), and should redistribute the revenues from the sale of credits to local actors (i.e. Sub-national governments, state or province, who in turn pass on a fair share determined based on Donor-Developing country Agreements to the indigenous people / local communities they use as their forest carbon strategy implementation partners.

2. Sub-national level : Sub-national entities (eg : State or Provincial governments), duly authorized by the developing country to implement Forest Carbon related project activities, are direct recipients of credits if successful, regardless of national performance, through a national forest carbon strategy and action plan.

3. Community level: Local stakeholders such as private landowners (eg. large-scale forestry, ranchers, mining companies, etc) are recipients of credits regardless of national performance if projects are successful and are incentivized through FC-NSAPs to implement co-benefits oriented projects that result in Premium FC-ERCs. Communities undertaking Forest Carbon projects will resolve to create appropriate receiving vehicles for their share of Forest Carbon funds, and also resolve to distribute those funds to ensure that those community members who participate in making conservation effective, as well as the poorest in each community, are duly benefited.

5. Reference Levels

This proposal considers appropriate setting of Reference Levels to be a critical exercise. It is a delicate balancing act. Firstly, it does not only have to ensure global additionality of reductions, but also ensure equitable reflection of in-country circumstances (income levels, forest cover, deforestation history, deforestation risks, land use planning, and urban development). Secondly, it does not only have to

[9] Lucio Pedroni, CATIE ("Centro Agronomico Tropical de Investigacion y Ensenanza"), Oct 2007

ensure creation of homogeneous FC-ERC's (in Phase 3), but also to reflect the different levels of governance and performance risks between countries and among projects in the eyes of willing funders (Phase 2).

We discussed above the material risk of "moral hazard" in a single-fund approach in Phase 2, and so we opted for a multilateral, market-like, inclusive approach which leverages the risk awareness of funders to create a positive bias towards quality, both at project and country level. (Note: there is also an international fund set up to supplement bilateral funding, which will be targeted at promoting inclusion so that not only the most advanced participants get Phase 2 funding)

There is another material risk: institutional failure, and the lack of a timely global "reference level" agreement being in place if negotiations begin on too theoretical grounds and have no market history to rely upon. Therefore, this proposal recommends that "reference levels" be set up under Phase 1 in participating countries, and that Phase 2 project funding be mostly in the form of rewards for measured, reported and verified (MRV) progress against these reference levels.

It is however, recognized that under Phase 2 there will be space for reference levels to be improved to reflect the bilateral negotiations between funders and developing countries and to reflect the different levels of governance and performance risks between countries and among projects in the eyes of willing funders.

In summary therefore, Reference Levels will have the following features [*refer to x.19 in FCCC/AWGLCA/2009/INF.1*]:

- Historic national deforestation rate (this might be set at the average level of measured country-level forestry emissions for any continuous 10-year period between 1990 to 2005 inclusive (tbd),
- Extant forest cover (a qualitative measure of both fraction of forest cover and size of forest cover), and per capita income (per capita GDP)
- Expected future emissions and removal trends
- Other country specific conditions and circumstances.

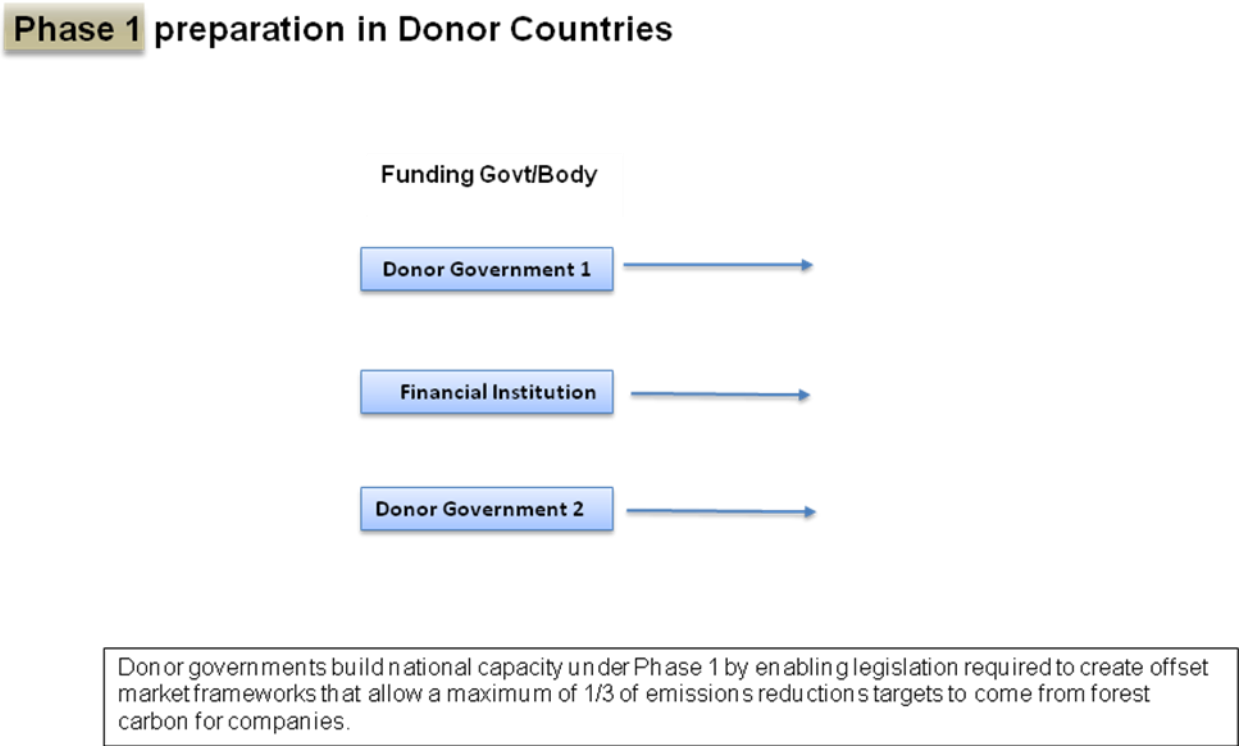
6. Eligibility

Under this operational framework proposal, eligibility criteria would have to be set at the level of both the participating country and at the level of the forest carbon project.

As the challenge at the country level is more complex and significant, these eligibility criteria are outlined within this informational document (6.1 below).

6.1 Donor Country Market Eligibility Criteria

Under Phase 1 and Phase 2, and for engagement in Phase 3, Annex 1 countries would prepare national carbon market frameworks and legislation that is required to set a cap of no more than 30% or 35% of annual emissions reductions to be met through offsets in Green Carbon. Unused annual offsets from Green Carbon could in "Phase 3" be "carried forward" for offset in later years. The national offset market legislation would enable demand for FC-ERCs in the global fund and cap and trade compliance market that will be effective post-2012 in Phase 2 and post-2015 in Phase 3. FC-ERCs would be non-tradable at the country level, as developing countries would deliver these FC-ERCs to funders based on Donor-Developing Country Agreements and measured against the national baseline through the Clearing House Fund.



6.2 Developing Country Eligibility

This requires the following elements to be targeted during Phase 1, and achieved during Phase 2, viz,

61.1. "Forest Carbon – National Strategy and Action Plan" (FC-NSAP) drawn up and approved by the Government, reflecting all of the other elements 6.1.2 to 6.1.8 below

6.1.2 Govt Approved FC-NSAP to be consistent with and cross-referred to any National Land Use Plan, & National Forestry Plan, that may exist at the time or that may be introduced in future [*paragraph x.28 (c) in FCCC/AWGLCA/2009/INF.1*]

6.1.3 Govt Approved FC-NSAP to be integrated with / cross-referred to the (CBD) NBAP & (if operational) Biodiversity and Ecosystems Policy

6.1.4 Three tiers of beneficiaries must officially be recognized in FC-NSAP and related documents : (a) local community (indigenous peoples / local communities), (b) state govt / provincial govt, and (c) central govt / sovereign, which, within a nested approach, must all be eligible recipients of forest carbon benefits in Phase 2 and Phase 3. This may require national legislation to be committed (during Phase 1) and passed (during Phase 2) in order to establish legal capacity for appropriate payments reaching local communities and indigenous peoples, and likewise (if not already in place) such payments reaching state/ provincial governments

6.1.5 Govt's approval in principle of a Nested Approach (see section 4. Above)

6.1.7 Govt's in principle acceptance of the guiding principles and operational framework of Tropical Forest Carbon, as regards Scope, Phasing, Structure, Reference Levels, Distribution, & Financing, by implementing the proposed operational framework at their national launch of Phase 1

6.1.8 Governance and MRV standards will be adopted before Phase 2 begins, such that these are not less stringent in application than the global standard to be announced and circulated during Phase 1. Country MRV will also incorporate verification of performance by independent reviewers appointed by the National FC authorities from a list approved by the United Nations FC authority [*refer to paragraph x.15 in FCCC/AWGLCA/2009/INF.1*]

6.1.9 Project eligibility standards – endimicity, community stakeholding, distribution mechanisms, etc

6.3 Project Eligibility

Specific eligibility criteria will have to be evolved by national governments in order to support the creation of eligible projects, and endorsing and supporting the development of "MRV" disciplines for these projects is an essential part of that process.

FC-NSAP documents will have to detail these eligibility criteria before embarking on Phase 2.

Project eligibility should be based not only on carbon capture potential or carbon emission reduction potential, but also on ecological, socio-economic and biodiversity assessments to ensure multiple-benefit impacts. International ratings of projects are expected to be used as a differentiator of quality.

7. Distribution Issues

The rationale and structure of the proposed "tiering" of in-country distribution of forest carbon receipts in Phase 2 (local community, state govt, central govt) has been addressed in detail above under "Structure"(s. 4.2).

The approach we have adopted (s. 3.4) in Phase 2 is allows funders preferences and risk-aversion to be expressed in the distribution of financing across participating tropical forest nations and projects.

However, in order to address the distributional and societal risks inherent in free markets, set "Upper and Lower Bounds" will also be set for reference levels, based on equitable criteria which factor in developing country deforestation and degradation rates, extant forest cover, per-capita income.

Lastly, the single international Fund set up to supplement bilateral funding during Phase 2, financed largely by transfer payments from developed countries will be used judiciously to supplement bilateral funding, and achieve an eventual distribution that enables all interested potential participating countries to build capacity and achieve social as well as ecological objectives locally, in addition to the global objective of carbon sequestration or better storage.

ANNEXURE 1

IMPLICATIONS OF A "FOSSIL FUELS ONLY" REGIME ON GLOBAL CO2 EMISSIONS

Our current emissions control regime is potentially ineffective in controlling and stabilizing the stock of CO2 and other GHG's to levels which limit warming to societally acceptable levels. A key reason for this ineffectiveness is that it largely ignores terrestrial emissions of CO2 and CH4, which are together one-third of all GHG emissions. The current regime also carries the risk of systemic imbalances as it may lead to significant land-use change towards bio-energy plantations, whilst creating more CO2 emissions through forest and grassland clearing than it saves by switching from fossil fuels to bio-fuels.

Given the stiff targets that are considered necessary to achieve 80% emissions reductions by 2050 and a stabilization of GHG concentrations at or around 450-500 ppm CO2e, it may not be an option to exclude "green carbon" (i.e. terrestrial carbon: forests, grasslands, wetlands plantations, croplands, pastures, and other stores of carbon on land) from the successor regime to the Kyoto Protocol after 2012. Below, we summarize evidence to support the need for a balanced regime going forward, one which includes both "green carbon" and "brown carbon",

1. **M. Wise et al. (2009) Implications of Limiting CO2 Concentrations for Land Use and Energy. *Science* 324, pp. 1183-1186.**

Reduction of global CO_2 emissions requires strategies that take into account anthropogenic emissions from terrestrial ecosystems as well as fossil fuels and industrial sources. Such a comprehensive mitigation strategy lowers the cost of meeting emissions reduction goals. Land use along a scenario in which only fossil fuel and industrial emissions are controlled to achieve At the same time, there are implications for agriculture as unmanaged ecosystems and forests expand and food crop and livestock prices increase. This is however, dependent on the technology and improvements in agricultural efficiency that have significant impacts on land-use change emissions.

2. **J. Fargione et al. (2008) Land Clearing and the Biofuel Carbon Debt. *Science* 319:5867, pp. 1235-1238.**

Biofuels, while a good energy source, can lead to carbon emissions if they are not produced correctly. The conversion of forests, peatlands, savannas and grasslands to produce food-crop based biofuels in Brazil, Southeast Asia and the United States creates a biofuel carbon debt by emitting 14 to 420 times more CO_2 than the annual reductions in greenhouse gases these biofuels provide by replacing fossil fuels. In contrast, biofuels produced from waste biomass and crops grown on degraded agricultural land do not accrue the same carbon debt.

3. **T. Searchinger et al (2008) Use of U.S. Croplands for Biofuels Increases Greenhouse Gases through Emissions and from Land-use Change. *Science* 319:5867, pp. 1238-1240.**

Most studies have found that substituting biofuels in place of fossil fuels reduces greenhouse gases as biofuels sequester carbon in feedstock. These studies do not take into account the resulting carbon emissions from farmers that convert forests and grasslands, responding to higher prices, to grow biofuel instead of grain targeted crops. The authors found that corn-based ethanol for instance, instead of providing 20 percent savings, doubles greenhouse emissions over 30 years and increases GHGs for 167 years. Biofuels from switchgrass, if grown on US corn lands increase emissions by 50 percent.

4. **PJ Crutzen et al. (2008) N_2O release from agro-biofuel production negates global warming reduction by replacing fossil fuels. *Atmos. Chem Phys*. 8, pp. 389-395.**

When N_2O emissions from biofuel production (including livestock emissions) are calculated in CO_2 equivalent terms, it is apparent that the production of commonly used biofuels such as biodiesel from rapeseed and bioethanol from corn can contribute as much or more to global warming by N_2O emissions than "cooling" caused by replacing fossil fuels. This is affected slightly by the N fertilizer uptake efficiency of plants and consequently grasses and woody coppice species have better climate impacts.

5. **Gurgel et al. (2007) Potential Land Use Implications of a Global Biofuels Industry. *Journal of Agricultural & Food Industrial Organization* 5:2, Art. 9.**

With an expected increase in biofuel production as global efforts to mitigate greenhouse gas emissions continue the author's model land conversion from natural areas to agricultural use. It is concluded that when land elasticity based on observed land supply responses is factored in there is less evidence of conversion of land from natural areas as it forces intensification of production compared to when only direct cost of conversion is taken into account when it comes to land use and biofuels. The pure conversion cost model leads to significant deforestation highlighting the need for including the non-market value of land in conversion decisions.

6. **KT Gilllingham et al. (2008) Impact of bioenergy crops in a carbon dioxide constrained world: an application of the MiniCAM energy-agriculture and land use model. *Mitig Adap Strat Glob Change* 13, pp. 675-701.**

Carbon dioxide reduction efforts and discussions will have an impact on the size of bioenergy crop production, which will play an important role in mitigation policies. Consequently, the expansion of bioenergy crops under climate mitigation policies will have implications for agriculture and land use systems. There will be decreases

in forestland and unmanaged land, decreases in the average yield of crops, increases in food crop prices, and decreases in the level of human demand for calories.

7. **L. Clarke et al. (2007) Synthesis and Assessment Product 2.1, Part A: Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations (U.S. Government Printing Office, Washington, DC).**

Based on four CO2 stabilization levels at roughly 450 ppmv, 550 ppmv, 650 ppmv, and 750 ppmv the linked emissions scenarios, the net terrestrial flux of carbon to the atmosphere across the scenarios increases as terrestrial biomes actually become a source rather than sink for carbon. This is due to increasing pressures to deforest for biofuels to meet stabilization levels. In addition, it is evident in the models utilized by the authors that if both fossil fuels and terrestrial carbon are priced then there is economic incentive to maintain stocks of terrestrial carbon while increasing the production of bioenergy crops. In the case of no price attached to terrestrial carbon it is clear that efforts to reduce emissions in the energy sector create an incentive to expand bioenergy production without a counter incentive to maintain carbon in terrestrial stocks. The ensuing deforestation increases terrestrial CO_2 emissions, requiring even greater reductions in fossil fuel CO_2 emissions, even higher prices on fossil fuel carbon, and further increases in the demand for bioenergy, leading, in turn, to additional deforestation.

8. **JA Edmonds et al. (2003) In Greenhouse Gas Control Technologies, J Gale, Y Kaya, Eds. (Pergamon, Amsterdam, 2003), pp. 1427-1432.**

Capture and storage of CO_2 has a major role to play in achieving deep reductions in global emissions levels. Technological processes such as decarbonization and engineered CO_2 storage systems can cost effectively stabilize the concentration of carbon in the atmosphere and the value of these processes only increases as the allowable quantity of CO_2 declines. The integration of such technology driven solutions for CO_2 levels is thus, a robust part of the UNFCCC climate mitigation strategies regardless of whether an increase or decrease in the availability of global oil and gas resources is discovered.

9. **MR Schmer et al. (2008) Net energy of cellulosic ethanol from switchgrass. *PNAS* (National Academy of Science of the USA) 105:2, pp. 464-469.**

Based on an analysis of switchgrass as a bioenergy crop through field trials of 3-9 ha (1 ha = 10,000 m2), it is evident that switchgrass produced 540 percent more renewable than nonrenewable energy consumed. Switchgrass monocultures managed for high yield produced 90 percent more biomass yield and estimated greenhouse gas emissions from ethanol derived from switchgrass were 94 percent lower than gasoline.

ANNEXURE 2

Fungibility of Forest Carbon & Energy/ Industrial Carbon

A key concern about forest carbon is whether it must be fully "fungible" with industrial emission reductions to ensure efficient market outcomes. Fungibility in carbon markets implies the ability to substitute one contract of forest carbon with one contract of energy/industrial carbon - definitely for reckoning net carbon positions, and ideally, right through to settlement and delivery. If it is assumed that the answer must be "yes" then there is a second concern often voiced: the risk that forestry credits could "flood" the carbon market and undermine efforts to reduce energy / industrial emissions at source. Since the second concern becomes irrelevant if the former is not the case, we first present the argument why allowing limited "offsets" in the way we describe here does not have to assume fungibility.

We have already presented the case (see Annexure 1) that a "brown carbon only" regime is not an option. This Annexure summarizes the case that a "green carbon" regime can indeed be sensibly introduced without either the need for "fungibility" or the related implications of "flooding".

About two-thirds of current anthropogenic emissions of GHG are due to the combustion of fossil fuels (mostly CO_2 emissions from large energy consuming sectors such as electric power, heavy industry, transport and buildings) and from other GHG's emitted due to industrial processes. About one-third of emissions are from terrestrial sources (including emissions from deforestation and other GHG emissions from agriculture) and a small fraction (about 3%) of GHG emissions come from the decomposition of waste.

The distinction between energy / industrial carbon (used here to refer to fossil fuel carbon from energy use, and other GHG's by industrial processes) and forest carbon is important. Forests are not the same as factories. In an industrial context, the energy efficiency of production and the carbon-intensity of energy use (the two main drivers of emissions intensity of production) are the result of commercial choices. Inputs and processes are determined by industry - human decisions in other words - and outputs are relatively predictable and measurable. Forests are much more complex: human decisions in the form of land use policy and forestry management are just two of many inputs that determine the capture and storage - or release - of carbon. In addition, we have drivers such as climate change, wild fires, storms and cyclones, natural pests and disease, and evolutionary pressures. While the processes of carbon capture and storage in forest ecosystems are understood better today than ever before, there is still much to learn. Moreover, the measurement of forest carbon emissions, capture and storage, while much enhanced by recent developments in remote sensing technology, is still not as straightforward as measuring industrial emissions.

While forests are evidently not factories, the question remains as to whether forest carbon (in the form of offsets) must be freely interchangeable with and traded alongside industrial carbon emission allowances on international carbon markets. In principle, there is no reason why the two forms of carbon cannot be traded in parallel. Experience shows that markets can sustain over very long periods differences in prices of what seems (to a casual observer) to be one commodity, but which is actually is many different commodities. Examples can be found in many markets (e.g. oil, currency, carbon itself) where similar but distinct commodities have developed separate price benchmarks, with a "spread" or "basis" reflecting perceived rationale for price differences between these commodities. The existence of such spreads has little impact on the overall liquidity of the market, although it adds an additional layer of complexity and risk for trading and hedging purposes.

Liquidity is defined as how much volume can be transacted without significantly affecting prices and high liquidity is a key characteristic of efficient markets. Experience in various markets suggests that the benefits of high liquidity are not simply lost where there is closely correlated trading in parallel commodities. On the other hand, there may be efficiency losses where commodities are truly interchangeable.

Consider the example of oil prices. For the last thirty years, these have been expressed in terms of two major benchmarks: West Texas Intermediate (WTI) and Brent Crude. Both are light, sweet crude oils, so in fundamental ways they are similar, but not identical. WTI was historically the more important benchmark and is still the most relevant for US markets. Brent Crude gained prominence as a benchmark for oil markets after North Sea oil became globally significant in the late 1970's. Brent Crude is now used to price two thirds of the traded oil market, although WTI still has the largest traded volume in both futures and paper markets. Typically, since WTI is considered higher quality, it has traded at a US$1- $2 premium over Brent Crude. However, as WTI is a 'landlocked' supply, local fluctuations in demand sometimes mean that the WTI price fails to reflect world oil market conditions; this has happened increasingly in recent years. While oil demand was shrinking around the world, it did not collapse to the same extent as WTI prices, hence the normal small 'premium' over Brent crude has become a large 'discount'. Despite such uncertainty, market participants have not had any serious concerns about the "fungibility" of the two main benchmark oils, WTI and Brent Crude.

In contrast, when commodities are indeed identical (e.g.: 3-month Eurodollar Futures contracts, traded in CME, Chicago, since 1984, and soon afterwards also in SIMEX, Singapore) then a case can be made for forcing full fungibility on grounds of efficiency. This is what happened with Eurodollar contracts, as CME and SIMEX agreed to make their respective contracts fully fungible. The key issue here was settlement cost and market efficiency, rather than liquidity.

ANNEXURE 3

Tropical Forests and Developing Countries in Scope

The Special Significance of Tropical Forests

New scientific evidence reveals that tropical Forests are a major carbon sink, capturing as much as 4.8 Gigatonnes of CO_2 per annum[10]. This is a major departure from the view that climax forests are emissions-neutral, and could help account for a large part of the difference between annual GHG emissions due to human activities (about 32 Gigatonnes) and the observed rate of increase in atmospheric concentrations (about 15 Gigatonnes). Protecting tropical forests thus becomes a vital tool for managing the climate.

Tropical forests are mostly located in developing countries as Fig. 1 demonstrates. These are the countries which also face high population growth rates, uncontrolled and unplanned urban development, changing consumption patterns and large segments of the population that are dependent on forests for their livelihoods[11]. Consequently, tropical forests geographically lie in areas where they face higher threats from over-exploitation, deforestation and encroachment and less capacity to mitigate these concerns with challenging objectives such as poverty alleviation and natural resource conservation that must be simultaneously addressed. Coupled with this is the need for strong financial support and institutional frameworks to be in place to incentivize the inclusion of forest protection in local economic plans and allow for the engagement of an equitable and diverse set of stakeholders in tropical forest management.

Tropical forests and carbon capture potential

In light of the global distribution of tropical forests and the fact that these biomes contain a significant portion of the total 2,050 Gigatonnes of carbon stored in terrestrial ecosystems[12], developing countries are major contenders in the forest carbon discourse (see Table 1 for a list of countries with tropical forests and their carbon stocks estimates). Their participation in the FC market and effective implementation of the Phase 1, 2 and 3 instruments is critical for the sustenance of tropical ecosystems and the mitigation of 35% of global emissions. The Terrestrial Carbon Group Project Policy Brief Number 1 estimates that about 363 GtC can be potentially emitted from forests in the next 50 years (taking 25% of soil and 100% of biomass) rates and using annual deforestation rates of about 12.5 million hectares.

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[10] S.Lewis & L. White, Nature, Feb 2009

[11] Forest resources directly contribute to the livelihoods of 90 percent of 1.2 billion people living in extreme poverty and indirectly sustain nearly half the population of the developing world by supporting natural environments that nourish their agriculture and food supplies (World Bank 2002, The Nature Conservancy 2009).

[12] UNEP-WCMC (2008) Carbon and biodiversity: A demonstration atlas.

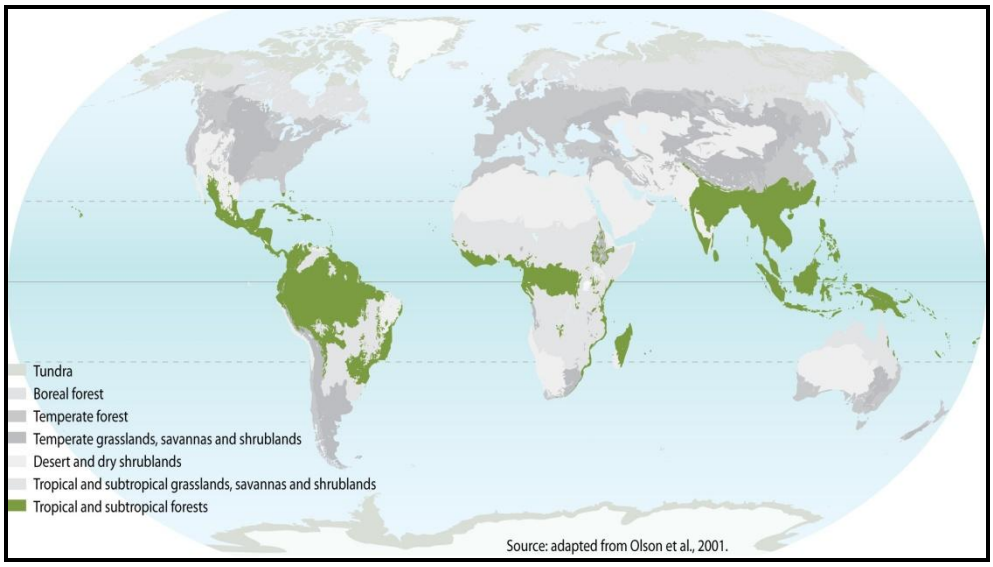

Figure 1: Geographic distribution of tropical forests

Tropical Forests, Social Benefits and Implications for Carbon Finance

The concentration on tropical forests in the FC market is then reflecting and capturing the significant role of these biomes in carbon sequestration and the necessity for fiscal support and capacity building, which in their present forms are resulting in continuing patterns of deforestation, degradation and biodiversity loss. The FC market provides the framework for a strong monetary stream through the fund based mechanism and the eventual creation of a compliance market post-2015. There is scope for sizeable amounts of interest in the form of developed country donors to facilitate national efforts in Phase 1 and 2 with the likelihood of financial resource generation increased even further under Phase 3. The potential for jointly considering poverty, equity, especially gender, and sustainability, all Millennium Development Goal's, through a tropical forest protection mechanism is attractive not only to international governmental organizations but also for CSR of private corporations. Additionally, the sense of competition based on the sale of FC-ERC's and MRV valued Premium FC-ERC's can result in markedly unique improvements in project designs and more stringent performance-oriented outcomes due to private sector involvement. Premium FC-ERC's further establish a new asset class that recognizes the value of multiple benefit impacts and creates demand for them ensuring that the interconnectedness of forests, their services, livelihoods and wildlife is preserved beyond carbon capture.

Poaching of wildlife, illegal logging and other environmentally detrimental activities generally indicate inadequate administrative and monitoring organization in place and gaps in understanding of the worth of the biomes amongst the populations that live inside or on the peripheries of forests. At a larger and more significant level they also reflect a lack of motivation in local bureaucrats to prioritize or at the least

equalize forest protection with regional development, as the latter is usually only understood as industrial growth.

The competitive contextualization of tropical forests through their value assessed in carbon storage potential changes this equation by generating revenue that would be attractive to national governments, politically acceptable to sub-regional authorities and significantly beneficial for the livelihoods of poor people. For the third tier level of communities, the focus on tropical forest carbon is a recognition of the rights of people who are daily users of natural resources because it presents them with a platform to inform policy through FC-NSAP's and enhance participation through the integration of relevant institutions into national action plans and strategies, with connectivity to the international domain via investors, MRV protocols and the FC market.

ANNEXURE 4
The Colours of Carbon

Blue carbon	The world's oceans bind an estimated 55% of all carbon in living organisms. Most of this is stored in mangroves, marshes, seas grasses, coral reefs and macro-algae
Green carbon	The carbon stored in terrestrial ecosystems e.g. plant biomass and soils in natural forests and plantations, agricultural lands, wetlands and pasture
Brown carbon	$C0_2$ emissions from human energy use and industry
Black carbon	Formed through incomplete combustion of fossil fuels, bio-fuel and biomass and is emitted as soot

The carbon cycle and the water cycle are perhaps the two most important large-scale bio-geological processes for life on earth. While the latter is widely appreciated, we are only just beginning to appreciate the size, complexity and significance of the former.

Climate change has driven increased understanding of atmospheric CO_2 as the main greenhouse gas, and how CO_2 emissions from human energy use and industry affect the climate. We refer to these emissions as **'brown carbon'**. The Emissions Trading System of the European Union is essentially a 'brown carbon' regime, as it does not currently recognize forestry credits.

The carbon stored in terrestrial ecosystems, e.g. plant, biomass and soils in natural forests and plantations, agricultural lands, wetlands and pasture, may be referred to as **'green carbon'**. The importance of green carbon is increasingly acknowledged as a key agenda item for negotiation in the UNFCC, specifically in relation to forest carbon and mechanisms such as REDD and afforestation, REDD-Plus, or others.

Moreover, the world's oceans bind an estimated 55% of all carbon in living organisms. Most of this is stored in mangroves, marshes, sea grasses, coral reefs and macro-algae. This has been dubbed **'blue carbon'** by UNEP (Nellemann et al. in press). Note that these ecosystems are also being degraded; in some cases faster than rainforests (see more explanations in the coral reef section).

Finally, a potent climate forcing agent, so called **'black carbon'** may be significantly reduced if clean burning technologies are employed. Black carbon is formed through incomplete combustion of fossil fuels, bio-fuel, and biomass and is emitted as soot. Black carbon warms the planet by absorbing heat in the atmosphere and by reducing the ability to reflect sunlight, when deposited on snow and ice.

In short, by halting the loss of 'green' and 'blue 'carbon, the word could mitigate as much as 25% of total GHG emissions, with co-benefits for biodiversity, food security and livelihoods (IPCC 2007; Nellemann *et al*. in press). This will only be possible, however, if the policy regime for climate mitigation accommodates the entire spectrum of carbon, not just one colour.