

The architecture of proposed REDD schemes after Bali: facing critical choices

A. KARSENTY

Département "Environnements et Sociétés", UPR 36, TA C-36/D, Campus de Baillarguet, 34398 Montpellier Cedex 5, France

Email : alain.karsenty@cirad.fr

SUMMARY

Rules governing the REDD (Reductions of Emissions from Deforestation and Degradation) scheme have yet to be established. Different national interests compete within the debate on baselines in order to maximize expected gains. The scheme could have a deleterious impact on the carbon market through massive hot air creation (fake emission reductions), and ultimately on the current international climate change regime derived from the cap-and-trade architecture adopted by the Kyoto Protocol. The political economy of avoided deforestation is frequently overlooked as is the issue of additionality, although both of them are more critical with deforestation at national level than they could be with project-based CDM. An alternative REDD architecture which relies on a special fund would not only allow protection of the carbon market against massive flooding by non additional credits, but could also help finance potentially efficient policies and measures. Sustaining long-term adequate funding is still an issue to be addressed on a multilateral basis.

Keywords: REDD, avoided deforestation, forest degradation, additionality

Architecture des projets de REDD proposés après Bali: faire face aux choix critiques

A. KARSENTY

La réglementation gérant la REDD (Réduction de émissions provenant de la déforestation et de la dégradation) a encore besoin d'être établie. Plusieurs intérêts nationaux font concurrence dans le débat sur les lignes de base, désirant maximiser les gains espérés. Le projet pourrait avoir un impact désastreux sur le marché du carbone de par une création énorme d'air chaud (fausse réduction d'émissions), et ensuite sur le régime international du changement climatique actuel dérivé de l'architecture cap-and- trade adoptée par le protocole de Kyoto. L'économie politique de la déforestation évitée est fréquemment ignorée, ainsi que la question de l'additionalité, bien qu'elles soient toutes deux plus critiques pour la déforestation au niveau national qu'elles ne pourraient l'être pour des CDM basés sur des projets. Une architecture alternative de REDD dépendant d'un fond spécial pourrait non seulement permettre la protection du marché du carbone contre une avalanche de crédits non-additionnels, mais aussi aider à financer des mesures et des politiques potentiellement efficaces. Le soutien d'un financement adéquat à long terme demeure une question qui doit être adressée sur une base multilatérale.

Arquitectura de planes de REDD propuestos después de la conferencia de Bali: decisiones críticas

A. KARSENTY

Todavía no se han establecido las normas que regulan el plan de REDD (Reducción de Emisiones por Deforestación y Degradación). Dentro del debate sobre las pautas necesarias, los diferentes intereses nacionales compiten para maximizar sus beneficios esperados. El plan podría incluso tener un efecto perjudicial sobre el mercado del carbono mediante un potenciamiento masivo del fenómeno de 'hot air' (compra de derechos a emisiones), y en última instancia sobre el régimen internacional actual sobre el cambio climático derivado de la estructura de topes y comercio adoptado por el Protocolo de Kioto. A menudo no se tiene en cuenta ni la economía política de la deforestación evitada ni el tema de la adicionalidad, aunque ambos desempeñan un papel más importante en cuanto a la deforestación a nivel nacional que tendrían en un mecanismo de desarrollo limpio (CDM) basado en proyectos. Una arquitectura alternativa de REDD, que dependería de una financiación especial, no solamente permitiría la protección del mercado de carbono contra una inundación masiva de créditos no adicionales, sino que también fomentaría la financiación de políticas y medidas potencialmente eficaces. El sostenimiento de una financiación adecuada a largo plazo sigue siendo un tema que debe ser tratado a nivel multilateral.

INTRODUCTION

Forests are back at the top of the international climate change agenda, with the intense discussions around the 'avoided deforestation' scheme, now called REDD (Reductions of Emissions from Deforestation and Degradation). The objective of such a scheme is to create incentives for developing countries to curb or limit deforestation and forest degradation. The principle was accepted at the 13th Conference of Parties of the UNFCCC held in December 2007 in Bali. However, whilst the principle has been acknowledged, the scheme and its implementation rules have yet to be established. Many difficult and controversial issues are to be addressed in the coming years or months, such as whether to link the issue with Kyoto's derived carbon markets and schemes (such as the European Trading Scheme and the Clean Development Mechanism), the use and design of baselines, ways of addressing degradation and the question of potential non permanence. Outcomes of these debates and expected decisions will be critical in shaping the emerging international forestry regime. Furthermore, as the quantities of carbon credits at stake are potentially very high, they could also have a negative impact on the carbon market and ultimately on the current international regime which focuses on combating against climate change derived from the cap-and-trade architecture adopted by the Kyoto Protocol¹.

After a brief summary of the debates related to forestry and CDM around 2000 and of the reasons for its partial failure, we will explain how challenging it is to determine a correct reference against which "reduction of deforestation" should be assessed. We will briefly review the main proposals for REDD architecture and show the limitations of those which propose to reward countries for a result against a baseline of past or anticipated deforestation. We shall then pay attention to the "avoided degradation" issue and how to deal with it. The second part of the article will raise the issue of the political economy of REDD and the proposed incentives, and will draw upon lessons learnt from decades of experience with official development assistance. We will argue that an architecture based on an international fund for tackling deforestation is preferable to a market-based one as it prevents the carbon market from flooding and allows for supporting policies and structural measures to be adopted inside and outside the forest sector, including payment for environmental services schemes. Finally, we will examine the impact of REDD debates on international strategies of some forest-rich developing countries which are demanding remuneration for their standing forests; in the case of such a scenario, tropical forests might become the international public goods which some stakeholders are looking for. We

will end with a call for a principle of responsibility *vis-à-vis* the world's forests for both industrial and developing countries and their citizens.

REDD: REDESIGNING THE REJECTED 2000 CDM PROPOSAL

The experience of including afforestation and reforestation in the Clean Development Mechanism of the Kyoto Protocol offers key insights into the challenges of expanding coverage to include avoided deforestation in a post-Kyoto agreement. The eligibility of land use, land-use change and forestry (LULUCF) projects under the Clean Development Mechanism (CDM) was one of the most controversial issues at the Sixth Conference of the Parties in November 2000 held at the Hague. The compromise position proposed by President Pronk (Decision 1/CP.6) prior to the suspension of CoP6 was to (1) designate avoided deforestation and combating land degradation and desertification in non-Annex I countries as adaptation activities eligible for funding through the Adaptation Fund but not through the sale of carbon credits; (2) allow only afforestation and reforestation projects in the CDM, with measures to address non-permanence, social and environmental effects, leakage, additionality and uncertainty.

The additionality of an emission reduction CDM project can be assessed by comparing the project's activities with a reference scenario consisting of the course of host-country activities that would occur in the absence of the financial incentives. If a proposed CDM project and its emission reductions would not have occurred under the reference scenario, then they could be considered additional. Implementing the additionality requirement needs defining the reference scenario. The reference scenario is a counterfactual hypothesis representing the "best guess" regarding the future course of events.

Looking back at the failure of afforestation/reforestation CDM: temporary credits and additionality

To address the non permanence issue², a specific asset has been designed for A/R projects: the temporary credits or tCERs (which expire after 5 to 9 years) (Dutschke *et al.* 2004) or the long-term expiring credits or ICERS, valid for the crediting period but delivered by segments alongside growing trees. However, such credits have a price value which is only a fraction of the value of "permanent credits" and need to be replaced when they expire, at the end of the commitment period for tCERs or at the end of crediting period (up to 30 years or twice -20 years) for ICERS. According to Chomitz and Lecoq (2004), the value of expiring credits is

¹ Under the Kyoto scheme, participant countries and/or industries (those concerned) are granted maximum emissions targets. If they do not use all their emission allowances, they can sell the ones left over to a third party which can fulfil one portion of its own objectives through this "carbon credit" purchase..

² In the energy sector, a non-emitted ton of carbon dioxide is considered "definitively non emitted". Yet this poses a problem in some cases such as afforestation projects: a tree plantation can still be destroyed by fire, and carbon released into the atmosphere, after its promoter has been credited with carbon credits. This difference prevents the two types of activities from being treated in the same way.

25% of permanent credits under certain hypotheses (e.g., a 6% discount rate). According to Dutschke *et al.* (2004), “A tCERs with a fixed validity period of 5 years will be worth between 14 and 38 percent of a permanent CER. An lCER with a validity period of 60 years, on the other hand, would nearly reach the value of a CER”.

Currently, negotiated prices are all around US\$4 for TCER CO₂ in projects supported by the World Bank BioCarbon Fund³. But private investors are reluctant to buy such credits for several reasons, including the following:

- There are numerous permanent credits available at a moderate price on the CDM market;
- They prefer to buy permanent credits at a cheaper price today because (i) they know that temporary credits will eventually be replaced, and (ii) providing investors are anticipating higher prices of emission permits in the future;
- Afforestation/reforestation credits are banned from the European Trading Scheme; and
- If companies are only looking to be considered as “carbon neutral”, it is easier and faster to buy carbon offsets on the voluntary market.

As a result, the afforestation/reforestation CDM has failed: to this day, only one project was successful out of the 1132 registered as part of other activities, as shown by CDM statistics of the UNFCCC⁴. One must add that until now industrial plantation projects have been rejected by the CDM executive board, notably for lack of additionality (Vance 2005, Michaelowa and Rawat 2007), and that small-scale projects have to bear the length of the approving process and the high transaction cost entailed by expertise and monitoring. Despite claims from the private sector that additionality criteria are too constraining and are a disincentive from a business perspective, they remain in force.

Why additionality is even more difficult to assess at national level than at project level

In this paper, we will not address the issues of monitoring deforestation and degradation from a technical perspective (remote sensing, inventories, etc.) even though we are aware that such issues themselves are far from being resolved, as pointed out by Grainger (2008) and that forest cover statistical production is not free from political influence (Grainger 2007). Instead, we will question the additionality of ‘deforestation reduction against a baseline’, which is critical from a genuine emission reduction perspective. In economic evaluation, setting a baseline project to assess the net effect (*i.e.* excluding factors external to the project) amounts to comparing two situations, one ‘with’ the project and one ‘without’ the project; and never a ‘before’ versus

‘after’ comparison which does not allow to disentangle the specific impacts of the project and the external events and dynamics taking place at the same time.

Additionality is difficult to assess at project level, despite clear and limited boundaries of the planned activity and a knowledge of historical data related to the area. The investor is the main economic agent concerned; he is supposed to provide a financial profile and detailed project characteristics, including financial returns which might be compared to existing benchmarks. At national level, knowing ‘what would have occurred’ in terms of deforestation without the REDD incentive is much more challenging. At least two critical factors can be mentioned:

- The number of variables at national level: deforestation is a result of numerous idiosyncrasies, both human and natural (such as climate), rather than the consequence of a single project undertaken by an individual or a company
- Political influence of interested governments and the role of state diplomacy which plays key roles in setting baselines

We will examine this issue of baselines in the specific case of REDD. Since we do not know so far whether REDD ‘rewards’ to countries in the form of carbon credits fungible with those of Kyoto (such as those from CDM) or other types of credits (including money), we will refer to such assets as ‘REDD credits’ and we will discuss of the nature of such credits in a further section.

MAIN PROPOSALS RELATED TO REDD ARCHITECTURE

Historical reference

The initial proposal presented by Papua-New-Guinea PNG and Costa Rica in 2005⁵ was to adopt a historical reference, *i.e.* the average of past deforestation converted into carbon emissions. However, such a proposal has serious weaknesses. Forest transition theory (Angelsen 2007), which often begins with massive deforestation, shows that’s it is unlikely that such high rates of deforestation are maintained over time. Behind forest transition theory, there is the increasing marginal cost of deforestation of landlocked areas. Hyde, and others, (Hyde *et al.* 1991, 1996, Hyde 1998) has greatly contributed to this debate on the causal relationship between the frontier of the economic rent and deforestation. Of course, such a frontier evolves with relative prices and decisions such as public road building can move the profitability perimeter of deforestation. But when remaining forests tend to concentrate in mountainous highlands, as is the case in several Asian countries including

³ <http://www.undp.org/energy/docs/cdmchapter7.pdf>

⁴ <http://cdm.unfccc.int/Statistics/index.html>

⁵ <http://unfccc.int/resource/docs/2005/cop11/eng/misc01.pdf>

Borneo the decline in terms annual deforested area is unavoidable: the only uncertainty is to determine when the inflexion point will be reached and what will be the pace of the slow-down. Countries having massively deforested in the past are likely to mechanically benefit from REDD credits and could enjoy a high probability of being rewarded, without any adjustment of public policies vis-à-vis the forest.

Such a historical baseline, despite Brazil's support, is not viewed favourably by countries with vast expanses of forest, relatively low deforestation rates and which are still waiting for a development wave which would extract them from widespread poverty. Typically is the case of Congo Basin countries, in which limited rates of deforestation⁶ has little to do with 'early efforts' of preserving forests: instead, low deforestation is linked to poor transport infrastructure, high timber extraction costs, low population densities in rural forested areas and limited attractiveness for large agricultural investments (due to unclear property rights and obstacles to 'smooth' business).

Predictive scenarios

Several researchers have suggested baseline scenario, *i.e.* predicting deforestation rates on a given period under a "business as usual" scenario. Chomitz *et al.* (2007) suggest computing a "normative reference level based on standardized estimate of the rate of increase of agricultural production, adjusted for an estimate of the rate of increase in agricultural productivity as well as the mean carbon content of forestland at the agricultural margin" (2007: 206). However, they also noticed significant correlations in the Brazilian Amazon between deforestation rates and beef price at farm gate; and also with rainfall. The linkage between agricultural prices and deforestation rates in open economies of forested and developed countries is well-known (Kaimowitz and Angelsen 1998). The recent situation of Brazil is worth mentioning: after a sharp decline in deforestation rates (between 30 to 50%) in the Amazon, some argue that the recent – and worldwide - increase in agricultural commodities prices has fuelled a revival of high deforestation rates in the Amazon, and especially in Mato Grosso where soy beans crops are expanding (Box 1).

Prices of agricultural commodities have increased sharply, and more deforestation has ensued, without any policy change from Brazilian Government which had previously presented low deforestation rates as the direct result of policy-making. Policy efforts have been effective, especially those related to the creation of new conservation areas, as pointed out by Taravella (2007). Yet they are only one factor among many explaining variations in deforestation rates over time. Persson and Azar (2007) point out the high variability of deforestation rates in Brazil, especially when compared with industrial emissions, which are much more predictable than the erratic variation in inter-annual deforestation rates.

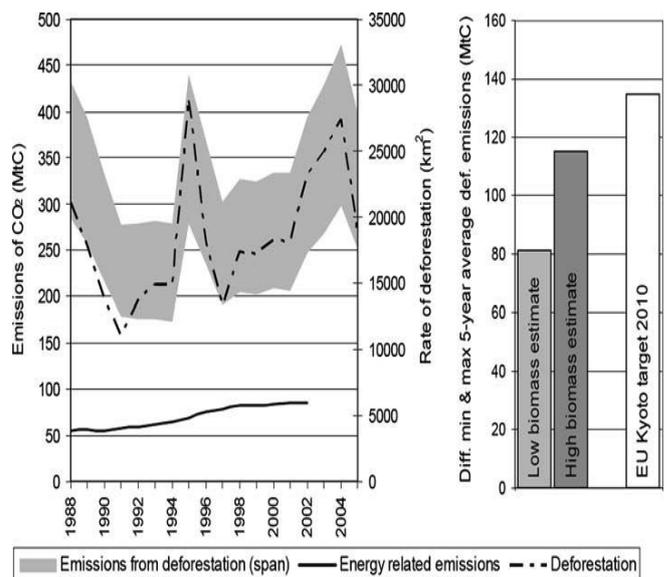
Such high variability reflects the sheer number of parameters involved in the deforestation – not only prices,

BOX 1 Behind the reversal trend in deforestation in the Brazilian Amazon

Deforestation rates in the Brazilian Amazon for the period between 2005 and mid-2007 were the lowest on record, according to figures released by INPE, Brazil's National Institute of Space Research. Preliminary estimates show that between August 1, 2006 and July 30, 2007, some 11 000 square kilometres of rainforest were cleared, a 31 percent drop from 2006. But, just some months after celebrating its success in achieving a reduction, Brazil's Government has announced a record rate of deforestation in the Amazon. During the last five months of 2007, about 7 000 square kilometres were lost. The major part of this deforestation has been registered in the State of Mato Grosso (53.7%).

The then Brazilian Environment Minister Marina Silva said the rise in the price of commodities, such as soya, could have influenced the rate of forest clearing. Some environmental NGOs and research institutes support this explanation. For instance, the Brazilian Forum of NGOs and Social Movements (FBOMS) has released in 2005 a report that links the increase in deforestation rates, specially in the State of Mato Grosso, with the soya surface expansion. According to official data available (IBGE 2004, 2006) only in the Mato Grosso State the soya covered a surface of 3 million hectares in 2003. In 2004 this surface has increased to 5.1 million hectares and to 5.8 million hectares in 2006.

FIGURE 1 Deforestation and energy related emissions in Brazil (source: Persson and Azar 2007)



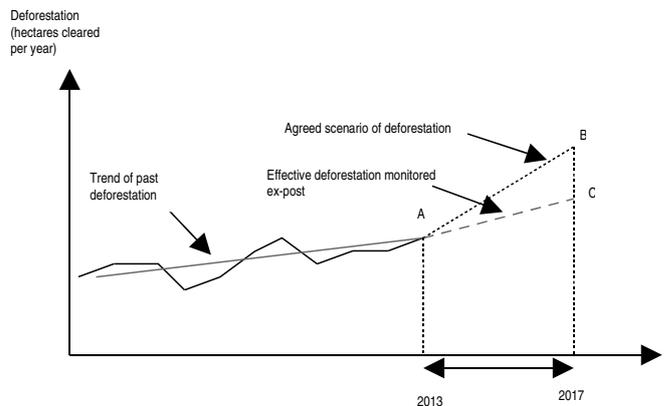
⁶ The annual deforestation rate for Central Africa has been estimated at 0.21 ± 0.05 % for the period 1990-2000 (Brown et al. forthcoming).

but also real interest rate, currency exchange rates, etc. – and their complex interactions, as analysed by many researchers (Angelsen and Kaimowitz 1999, Geist and Lambin 2001, Kanninen *et al.* 2007). This also suggests that single parameters – such as the rate of increase of agricultural production coupled with productivity, as suggested by Chomitz *et al.* (2007) – are not sufficient proxies to predict deforestation in a given commitment period of a few years (currently 5 years under Kyoto agreement). Moreover, prices of agricultural commodities are volatiles since they are shaped by anticipation and speculation, just like oil and many other primary resources (notably on the Chicago commodities market), as well as the economic growth pace of emerging countries⁷. Such factors are not predictable, neither are they the outcome of the current debates (which are critical for the fate of forests in many countries) about the importance to be given to the use of biofuels in industrial countries. Setting ‘business as usual’ scenarios for a given 5 year period is therefore not only challenging; they are more likely to resemble ‘random scenarios’ than anything else.

Annual adjustments of such scenarios to take account of changes in the markets and environmental factors would certainly lead to more accurate previsions. But, will it still be a scenario or something else? They would essentially force experts to disentangle an embedded array of factors, isolating what can be the net impact of policies and measures effectively taken by the authorities to tackle deforestation (i.e. stringent law enforcement, removal of agricultural subsidies, etc.) and external factors such as (involuntary) changes in market prices for agricultural commodities, drought episodes causing forest fires (as well as abnormally high rainfalls). From a negotiation perspective, such a formula would be very difficult to handle since countries would not get a precise idea of the baseline before the commitment period (and even until the end of this one, since evaluations are easiest to make ex-post rather than ex-ante). Frequent revisions of baselines would also multiply the opportunities for political pressures during the negotiation process, which would seriously undermine the credibility of the mechanism. In this respect, is unlikely that countries will accept the idea of having a group of independent experts in charge of disentangling, year after year, external factors from measurable policy impacts. Here, sophistication of expertise is likely to conflict with national interests of countries negotiating for the best situation for themselves, in order to maximize expected gains without having to adopt policies and measures that are too costly, both socially and politically.

Some countries proposals are very likely to create ‘hot air’ mechanically. More precisely, the PNG proposal, followed by COMIFAC one, to adopt a “development adjustment factor”⁸ reflecting future national development needs. This would altogether lead to more deforestation and more REDD credits. Below is a possible situation:

FIGURE 2 Example of possible rewarding for “avoided deforestation” under futures baseline scenario and ‘adjustment factor’



Surface area [ABC]: “avoided” deforestation (against the scenario) opening rights to REDD credits

Persson and Azar (2007:1290) noticed, in reference to the so-called “Compensated Reduction” proposal (Santilli *et al.* 2005), that “countries that historically have had low rates of deforestation (e.g., Peru, Bolivia) could be given targets above recent deforestation rates, to promote participation. This would effectively create hot air”. The COMIFAC proposal is an example of this hypothesis in which more emissions from deforestation can go hand in hand with more emissions allowances sold to industrialised countries

Sophisticated proposals do not change the basic baseline problem

Discounting limited reductions against predicted margins

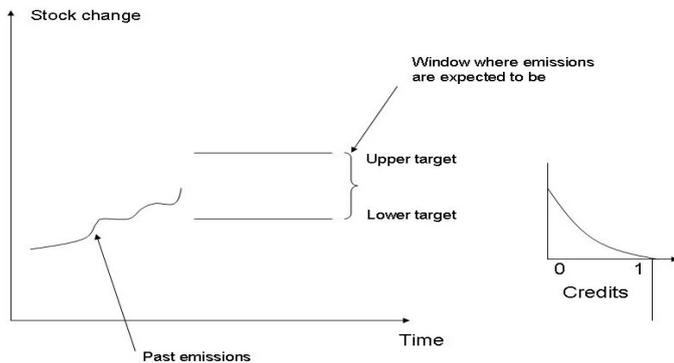
Schlamadinger *et al.* (2005) have proposed a smart formula intending to reconcile incentives and environmental integrity. They suggest that the target should be set as an upper and lower bound between which future emissions from deforestation are expected to lie. Emissions reductions below the upper bound will be credited but at a discounted rate. The closer one gets to the lower bound, the less credits are discounted, and below the bound they are fully credited.

But even though such a formula could mitigate in some cases the amount of potential ‘hot air’ generated by the mechanism, it does not modify the likelihood of such ‘hot air’ which will depend only on the targets set (especially the “lower target” in this case). No accounting system is able to prevent for (i) unexpected changes altering the previsions in one way or another, (ii) manipulated baselines (i.e. high levels of deforestation rates predicted) resulting from ill-conducted negotiation processes. In such cases, it is likely that political pressures would focus on raising the lower target of emissions as much as possible in order to maximize

⁷ See “Wall Street Is Betting on the Farm”, New-York Times, 19 January 2007.

⁸ <http://unfccc.int/resource/docs/2007/sbsta/eng/misc02.pdf> p. 40

FIGURE 3 Schlamadinger *et al.* (2005) corridor and discounting proposal for REDD baselines



chances of being rewarded with undiscounted credits.

The Carbon Stock Approach

The Centre for International Sustainable Development Law (CISDL) submitted a proposal to the UNFCCC (Prior *et al.* 2007), suggesting that tradable carbon credits could be issued to finance activities to protect forests in host countries. This proposal can be considered as a ‘cap-and-trade’ approach which provides both for deforestation and degradation:

- the amount of carbon stocks that exist in a country’s forests are calculated prior to the crediting period;
- the forest area is divided in two parts: a “reserve” that must not be degraded, and the remaining area that is expected to be converted in the future for development needs;
- only forest conservation within the area outside the reserve can result in the issuance of tradable carbon credits; and
- the loss of carbon due to *force majeure* events (e.g. fires, flooding) should not result in less carbon credits being issued.

The originality of such an approach lies in its ability to use the case of *force majeure* in case of natural phenomena impacting on deforestation rates (although it should also be extended to human phenomena because events such as international price variations could also be considered as *force majeure* from a national perspective). However, one could argue that setting the size of the reserve would raise similar problems to the negotiation of a baseline⁹. Besides, it has been acknowledged by Prior *et al.* (2007:9) that: “Reserve will be difficult to agree upon and in effect is similar to a future baseline assessment at a future point in

time”. They also specify that: “The authors recognize that establishing the reserve will be a difficult issue. However, it is not expected to be any more difficult than establishing national baselines that must take into account historic as well as future deforestation rates, or Annex I Parties’ quantified emission limitation and reduction commitments” (2007:16). If we move away this issue of national baseline which we already discussed, we have to pay attention to the second argument, *i.e.* the comparison with negotiated national Annex 1 emissions targets which require some attention.

- First, REDD is proposed as an asymmetrical regime in which countries can gain but never lose, since there is no sanction or compensation required if deforestation lies beyond the baseline set. By contrast, Annex 1 countries are committed to stay below their emission targets, otherwise they face penalties¹⁰. And if their forest carbon stock decreases, countries must balance putting more efforts into reducing emissions in other sectors. Moreover, if a country is unable to fulfil its reduction targets domestically, it is allowed to get emission credits through CDM schemes (or buying from an Annex 1 country that has reduced its emissions levels more than expected), thus restoring the balance. Developing countries with deforestation rate greater than expected would not have to face such constraints of balance: overall emission of all countries joining REDD schemes can be higher at the end of the commitment period than at the beginning, while a significant quantity of credits could have been distributed to a handful of those countries.
- Secondly, the emissions profile of industrial countries is closely linked to economic growth, except during the rare years of recession, or even the rarer ones of economic collapse, such as the former USSR in the early 1990s. As such, the general trend is that of an *increase* in emissions, as the Western World has enjoyed an uphill economic growth trend since the Second World War. By contrast, deforestation and economic growth have a more complex relationship, as shown by the forest transition theory and the annual variability of deforestation trends in a country such as Brazil (see figure 1), given the numerous variables that influence changes in deforestation rates.
- Thirdly, Annex 1 countries’ targets set in reference to 1990 levels have been chosen deliberately to grant hot air to a key actor such as Russia, which was (along with Ukraine) supposed to be the ‘credit seller’ (and as such, provided with an incentive to engage in the agreement) while the USA was expected to be the ‘big buyer’ of the former USSR’s hot air. However,

⁹ In addition, monitoring full carbon stocks in hundreds of millions of hectares of tropical forests would require extended monitoring devices, human means and probably a big amount of money to maintain the entire system on a sustainable basis.

¹⁰ As stated by the Kyoto Protocol Compliance Mechanism, the non compliant Party has to make up the difference between its emissions and its assigned amount during the second commitment period plus and additional deduction of 30%. http://unfccc.int/kyoto_protocol/compliance/introduction/items/3024.php

the subsequent change in US administration brought about changes in the course of history. This is a good demonstration of the ability of a negotiation process to allow for massive quantities of hot air in order to provide incentives to countries that would otherwise be reluctant to engage in such agreements. One could suspect that since involvement of developing countries in setting national emissions targets is at stake (for those numerous countries which are willing to extend the Kyoto architecture beyond current committed countries – Ximena Rubio Alvarado and Wertz-Kanounnikoff 2007), the calculus is to give an incentive to such countries at the price of generating potentially significant amounts of hot air. At the risk of destabilizing a fragile carbon market (if credits are fungible with those of Kyoto) while it is recognized that, so far, Kyoto agreement have reached limited results in regard of reduction efforts needed (Prins and Rayner 2007).

HOW TO DEAL WITH “DEGRADATION”?

The mention of degradation at CoP 13 derived from the willingness of Africa’s Congo Basin countries to be rewarded for ‘early efforts’ made by most of them to implement compulsory management plans. COMIFAC preparatory documents mentioned the possibility of being gratified in proportion to their forest surface area covered by management plans¹¹, implicitly assuming some strong hypotheses:

- The ‘business as usual’ baseline would be unregulated logging (despite the compulsory character of forest management plans (FMPs) in all COMIFAC countries);
- Strict implementation of FMPs would result in lower carbon emissions than unregulated current selective logging (at a rate of 3 m³ commercial timber volume per hectare on average in DRC, 10 m³ in Cameroon and 10-12 m³ in Gabon for concessions located in distant areas).

Evaluating carbon emissions from degradation would require extensive on-the-field monitoring, since remote sensing is not suitable for this (Foody 2002). But beyond this technical difficulty (and its financial implications), there are a couple of points worth being mentioned:

- FMPs are not designed to ensure biomass recovery but a minimal recovery of volumes of commercial species; in most cases, the felling cycle is too short (30-35 years) to allow reconstitution of the initial standing volume (Sist *et al.* 2003a), especially in primary or primary-like forests¹². Reduced Impact

Logging (RIL) could improve the situation, but in countries where logging intensity is relatively high (such as Indonesia), RIL only is unable to recover initial volumes of commercial species. It is therefore difficult to argue that such improved logging is not a form of “degradation”, even though this does not mean that such practices are automatically unsustainable (Karsenty & Gourlet-Fleury 2006);

- In countries with very selective harvest methods, such as in the Congo Basin hinterland, the implementation of management plans introduces limitations on harvest of some species according to their recovery profile provided by inventories (often the most valuable species). Loggers are also encouraged to shift toward abundant less-used species (LUS). From an economic perspective this generally means a greater volume harvested per hectare to compensate for the lower commercial value of such LUS. But any increase in harvests automatically leads to an increase in damages (and carbon emissions), even with RIL methods, since this entails more roads, skid trails, timber parks, etc. Thus, implementation of FMPs could lead to *more* carbon emissions when hyper-selective logging (a threat to biodiversity conservation) is the current practice.
- FMPs are the core of a new generation of forest laws in most tropical countries. In countries where forest concessions are the dominant form of forested land use (such as in the Congo Basin), non-compliance with this basic legal requirement should be easy to sanction through the threat of ending the concession contract. From a political standpoint, it would be difficult for governments to say that the “business as usual” scenario will be unregulated logging.
- According to Laporte *et al.* (2007), even the very selective harvest one can find in DRC (3 m³ per hectare) emits around 10 tons of carbon per hectare (around 37 T of CO₂) when taking damages into account. Thus, it would be easy to demonstrate that strict forest conservation (assuming zero emissions) is a better scenario (at least from a carbon emissions perspective) than logging, even with adequate FMP and RIL implementation. Conservation organizations supporting the development of concepts such as “conservation concessions” (Niesten and Rice 2004) will find through such “avoided degradation” schemes the financial means they currently lack for compensating governments and stakeholders for the opportunity cost of non-logging. In DRC, if REDD credits are valued at only US\$ 15 per ton of CO₂, this means a valuation of US\$ 555 per hectare. Providing a 30-year rotation, this is equivalent to a US\$ 18.5 per hectare for a concession (not discounted). If temporary credits are to be used, and providing a value between

¹¹ http://unfccc.int/files/methods_and_science/lulucf/application/pdf/gabon_english_pdf_230207.pdf

¹² Forest having being formerly exploited at very low intensity to extract some high-value trees specimens.

15 to 25 % of permanent credits, this means a range of US\$ 3 - 4.6 per hectare, potential REDD subsidies for additional conservation in primary-like forests has to be compared with opportunity costs of the conservation of unlogged forest. For Cameroon, we estimated this at around € 14.5 (US\$ 21 according to February 2008 exchange rates) per hectare (Karsenty, 2007), which is probably amongst the highest levels within Congo Basin countries because of fiscal structure. Thus, in a significant number of cases, the financial leverage brought by “avoided degradation” activity will not be enough to fill the gap without the mobilisation of additional funds.

WHICH CREDIT UNITS?

So far we have evoked only REDD credits, since disagreements still exist between countries and some Parties¹³ about the nature of these credits. Brazil does not support tradable (fungible) credits on the Kyoto-derived carbon market, officially to prevent industrial countries bearing historical responsibilities of carbon emissions from escaping domestic efforts of reduction through buying REDD credits. Concerns about a possible ‘flooding’ of carbon market by REDD credits are growing (Leach 2008), but many (such as Chomitz *et al.* 2007:198), following the arguments of the Stern review, suggest that new carbon credits could be absorbed through more stringent commitments in Annex I countries. This argument could stand – even though one could be doubtful about the automaticity of such an adjustment – if one were sure that REDD credits were genuinely additional – or at least a very large proportion of them were. Otherwise, it would have the very same effect as injecting forged money into a financial circuit, whilst CO₂ emissions would continue increasing.

If REDD credits were tradable with CDM and the market of inter-Annex 1 countries, the same permanence issue as A/R CDM will re-emerge. Will a country having being rewarded for reduced deforestation in a first commitment period be forced to make a ‘refund’ if he oversteps its target for the subsequent period? One obvious solution would be to use the same temporary credits already in force for the A/R CDM credit. Such temporary credits are also suggested not only for addressing non-permanence risk, but also to mitigate the one of market flooding. But, it is acknowledged that, for CDM, temporary credits are one of the causes of the failure of ‘forestry-CDM’, since the market is unwilling to buy them. More generally, this brings us back to a well-known paradox about economic incentives: the fact of discounting assets expected by the agent can prevent undesirable effects from taking place, such as market flooding and non permanence; but it will also discourage the recipient from engaging in the implementation of socially and politically costly measures. In such a case, it is likely that the governments’ efforts will focus more on negotiating the rules and baselines than on

implementing such costly measures to curb deforestation.

Using money instead of carbon credits would avoid the risk of market flooding, but not the risk of non-permanence – except if REDD rewards are stringently capped to mimic temporary credits.

TAKING SERIOUSLY THE POLITICAL ECONOMY OF ‘AVOIDED DEFORESTATION’

Everything is taking place as if many economists and climate specialists alike assumed all too readily that Governments act ‘neutrally’ and in favour of the common interest of their own country and population. Another rather odd vision, especially when referring to many developing countries, pictures a supposed ability that omnipotent governments would have to accelerate or slow down deforestation as they like for strategic purposes. Such an argument is still evoked when debating on the reference period to be adopted for the baseline: some fear that if the reference were set up at the beginning of commitment period, some Governments would voluntarily increase deforestation rates ‘to degrade their baseline’, but would reduce their deforestation rate once within the commitment period in order to maximize the amount of REDD credits they would receive. Such a view of governments of developing countries as calculating ‘car drivers’ able to use the accelerator and the brakes of deforestation rate at their will is not very realistic. Various interests are represented in governments, and contradictions are frequent between ministries of agriculture, mines, transport, energy, and forestry. Furthermore, the capacity and ‘credibility’ (Rodrik 1989) of governments are variable but most often limited. Even the Brazilian government seems unable to contain the effects of recent agricultural price increases on the pace of deforestation, despite commitments by the Ministry of Environment.

Will governments modify their macro-economic policies (currency exchange rates, interest rates, investments in infrastructures, etc.) to curb deforestation in order to seek REDD credits? This is doubtful, but even if a government decided to do so, the potential impact of some measures on deforestation would be uncertain. Kaimowitz and Angelsen (1999) stated that “*Generally, it is hard to find any-clear-cut relationship between macroeconomic variables and policies and deforestation*”. Moreover, as Kanninen *et al.* (2007:22) pointed out, “*Rising agricultural output prices and reduced input prices render agriculture more profitable, and lead to expanded areas under production. Other macroeconomic factors with significant potential to impact upon deforestation include external debt, foreign exchange-rate policy, and trade policies governing sectors linked to deforestation (mainly agriculture and cattle ranching) and forest degradation (mainly timber extraction). The net impacts of such policies on forests are however, highly variable. For example, a devaluation or currency depreciation will stimulate exports,*

¹³ Reluctance vis-à-vis inclusion of REDD into the carbon market is perceptible within the European Commission.

and the deforestation impact depends on whether or not export crops are suitable for cultivation on cleared forest land”.

The case of land tenure and land use

Even some policies unanimously regarded as positive, such as improving the security of land tenure (through land titling or other procedures) can have different or perverse impacts over time. Land titling can give landowners access to credits (thanks to the collateral of the titled land itself) which can be used on the short term to expand crops against forest cover (Kaimowitz 1996). On the long term, secure land tenure is a good way of promoting reforestation (which is not accounted in most REDD proposals) and maintaining forest cover on the secured land, as shown in the example of China (Hyde *et al.* 2003). A committed government could, however, be hesitant to undertake a land titling reform – which is potentially conflicting as it implies choices between groups and individuals for full ownership recognition – only for being rewarded under the REDD scheme for the future commitment period. Such structural reforms and changes, with important social and economic consequences, have little chance of being undertaken as a result of potential REDD credits incentives.

Well before deforestation became the global concern it is nowadays, numerous economists had shown the potential economic gain that developing countries could derive from improved land tenure security in terms of agricultural development. Evolutionary land right theorists would show that when social costs of conflicts about land were growing with changes (including population growth), the corresponding social demand for land security would lead to institutional change, such as land titling programmes¹⁴. But in some regions, such as Sub-Saharan Africa (SSA), land conflicts have continuously increased (and associated social costs also) without corresponding induced institutional change¹⁵, despite collective gains emphasized by the theory (Platteau 2000). One can suspect the same scenario will happen again with the so-called REDD incentives. If political costs of reforming are too high, and if governments are not fully committed toward the nation’s collective interests, future REDD credits will not weigh significantly in the balance, especially inasmuch as they are postponed in time and discounted (as such and because of systems adopted to address non permanence and uncertainties in baseline settings).

However, some policies are known to be efficient against deforestation, such as applying existing stringent laws to prevent deforestation. Why are such laws not already applied? This is obviously a governance issue, with vested interests of government officials, fear of social and political costs, or simply incapacity to implement land use regulations. Are payments to governments likely to change

this? Here again the problem lies in the gap between private interests of politicians and collective interests of the nation in the name of whom they claim to speak. Many politicians take advantage of the *status quo* and fail to act effectively to improve collective welfare.

Overlooking lessons about aid and development?

Climate analysts and negotiators are often little informed of debates and lessons drawn from decades of mitigated results about aid and development. A general statement by two experts in the field is worth quoting in full: “(...) *Alesina and Dollar (2000) look at the relationship in general between official finance and policy reform. One aspect of their paper is quite relevant to aid and reform: they ask whether or not there is any tendency for increases in finance or decreases in finance to lead policy change... In only a handful of cases does policy significantly improve in the following three to five years, and in just as many cases policy significantly worsens. The most striking fact here is that in general policy is quite persistent. Large changes in policy are the exception, not the rule. Analytically, aid can be expected to have two opposing effects on the incentive for a government to reform. If aid is linked to reform there is some favourable substitution effect: if the government agrees to reforms it will receive more aid. Offsetting this effect is the income effect: the more aid the government expects to receive, the less necessary it is to implement those reforms which are politically costly*” (Collier and Dollar 2004 – emphasis added)

Such statement highlights a critical issue for the architecture of the REDD debate: linking financial reward to reform can be an effective way of pushing governments to make reforms. Conversely, whilst governments have good chances of receiving REDD credits thanks to their negotiating favourable baseline settings, the likeliness of their undertaking costly reform is limited. Reducing deforestation is without doubt socially and politically costly and will need early funding to launch reforms, compensate the potential ‘losers’ and maintain efforts over time. This requires linking financial terms to agreed conditionalities regarding reform contents and measures implemented rather than ‘unconditional rewards to governments for reduced deforestation against a baseline’. In other terms, it is necessary to move away from most current REDD proposals and focus instead on using more traditional and flexible instruments such as financial facilities (*funds*).

THE CASE FOR AN INTERNATIONAL FUND TO TACKLE DEFORESTATION

Besides preserving the carbon market from flooding with numerous non additional REDD credits, a Fund designed to support reforms and specific measures to tackle deforestation

¹⁴ Platteau (1992) analysed critically this evolutionary theory of land rights and institutions.

¹⁵ According to Österberg (2002) only 3 to 8 % of lands are titled in SSA.

and degradation offers several advantages over the carbon-market REDD architecture. Only a Fund can contribute to implementing policies and measures to curb deforestation and degradation without having to compute the quantities of carbon saved – a calculation which is often impossible to evaluate or even to impute to a given public policy (Pirard and Karsenty, in press).

Critical reforms and processes, such as rural land tenure reforms, change in agriculture patterns in forested areas (with sustainable intensification), creating economic alternative for forest users, public-private partnership for monitoring forest crimes, radical change in forest services governance, large scale PES programmes, etc., require both financial means and political will. Unconditionally rewarding governments for reducing deforestation against a baseline does not guarantee that such policies will be agreed upon and implemented. Yet, in order to help the negotiation process, it might be necessary to keep a window open for rewarding governments (with money rather than carbon credits, to avoid negative impact on carbon markets) provided they effectively adopt tangible measures such as enforcing law implementation. A performance index could be envisaged in this respect. In any case, however, the bulk of the funds should be directed towards structural policies & measures, field programmes and PES schemes to curb deforestation and degradation. It is critical to address such issues in a holistic way: the launching of a large PES programme cannot be sustainable without also addressing land tenure issues (this could be the major outcome of such a PES scheme: making land rights clarification an urgent necessity if one wants to generalize conservation contracts), as well as working simultaneously on agricultural practices to foster sustainable intensification.

Sustaining incoming financial flows

Despite its flexibility, the traditional weakness of the Fund – just like development aid – is ‘donor fatigue’, especially when concrete results are delayed or inexistent. The Norwegian government announced that by the end of 2007 it would devote more than US\$ 500 million a year for a 5-year period to fight deforestation. However, such unilateral voluntary commitments are unlikely to be numerous. Sustaining the financial flow into such a Fund seems critical inasmuch as only long-term efforts are likely to succeed in curbing deforestation. Politicians and personalities have suggested some mechanism to maintain the flow of funds earmarked for mitigating climate change. At CoP 13, the French Minister of Sustainable Development suggested a tax on international financial transactions, derived from the so-called ‘Tobin Tax’ (*Libération*, 13 December 2007). Early 2008, Prince Charles “called for a public-private partnership of banks, insurance companies and pension funds alongside international financial institutions to provide financial incentives to combat

deforestation taking place on a massive scale” (Reuters, 15 February 2008). In particular, he suggested that proceeds from the planned auctioning of emissions permits under the European Union’s Emissions Trading Scheme could be used to provide long-term incentives for sustainable forestry in developing countries (*idem*).

Such a call will probably take time before reading wide international consensus, especially as international taxation schemes are at stake. Yet it seems the most reasonable way to construct an appropriate instrument.

The Forest Carbon Partnership Facility of the World Bank: a promising tool?

At CoP 13, the World Bank officially launched a new prototype fund for ‘avoiding deforestation and degradation’. As mentioned on its website, “The proposed FCPF would assist developing countries in their efforts to reduce emissions from deforestation and land degradation (REDD). It would have the dual objectives of building capacity for REDD in developing countries, and testing a program of performance-based incentive payments in some pilot countries, on a relatively small scale, in order to set the stage for a much larger system of positive incentives and financing flows in the future”¹⁶. This Fund also has a double window structure – a “readiness mechanism” aiming at helping 20 developing countries to “arrive at a credible estimate of their national forest carbon stocks and sources of forest emissions, as well as assist the countries in defining their reference scenario based on past emission rates for future emissions estimates” and a “carbon finance mechanism” for which a “few countries would be selected to participate in this mechanism through which the Facility would implement and evaluate pilot incentive programs for REDD based on a system of compensated reductions”.

In a presentation at Chatham House in December 2007¹⁷, World Bank staff was more precise about concrete actions supported by the FCPF in order to tackle deforestation and degradation; these include:

- Removing subsidies leading to deforestation and degradation;
- Improving forest law enforcement;
- Securing rights for indigenous peoples and other forest dwellers;
- Devolving forest management to local communities;
- Forest certification;
- Conservation concessions;
- Strengthening the protected area network;
- Direct payments for environmental services;
- Improving fire prevention and suppression;
- Forest management plans for more rational use of forest resources;
- Reduced impact logging;

¹⁶ <http://carbonfinance.org/Router.cfm?Page=FCPF&FID=34267&ItemID=34267&ft=About>

¹⁷ http://www.chathamhouse.org.uk/files/10798_171207bosquet.pdf

- Reforestation of degraded lands to meet timber and energy needs;
- Alternative livelihood programmes; and
- Intensifying agriculture and promoting agroforestry.

In fact, once analysts begin to think about concrete means to tackle deforestation, they reach the conclusion that a coordinated set of policies and measures implemented through coherent field programmes are urgently needed. Moreover, without ‘early money’ that only a Fund can deliver, such measures are unlikely to be implemented. In this respect, the FCPF could play a decisive role in collaborating with governments to set up appropriate policies and measures, on the one hand, and large-scale PES programmes targeting rural communities, individual farmers and companies on the other. Rather than spending vast sums of money to fund foreign expertise to establish unlikely baselines, ‘readiness money’ could go into field programmes designed to tackle

BOX 2 Supporting sustainable forest management and certification development: a role for the FCPF?

One might consider a linkage between environmental service payments and ‘avoided deforestation and degradation’ actions supported by the FCPF. Financial rewards could be given to concessionaires who decide to comply with the law and commit themselves to independent auditing based on performance, such as forest management certification. One could consider that a concessionaire who invests in independent auditing to obtain certification places himself under scrutiny and invests in its “reputation”. This is certainly a long and difficult element to acquire yet it can be lost very easily, as anyone knows. Compliance with law is the first requirement for internationally-recognized certification schemes, and it works as an ally for the forest service with respect to law enforcement.

One way of encouraging independent forest certification for its various positive impacts, would consist in reducing forest taxation for certified concessions. Governments may be reluctant to adopt such a measure, however, since their revenues would fall as the total area of certified forest land increased, unless these losses were compensated by an ad hoc Fund such as FCPF.

deforestation whilst keeping to poverty reduction objectives and fairness vis-à-vis local users of forest resources

Compensating local stakeholders more critical than rewarding governments

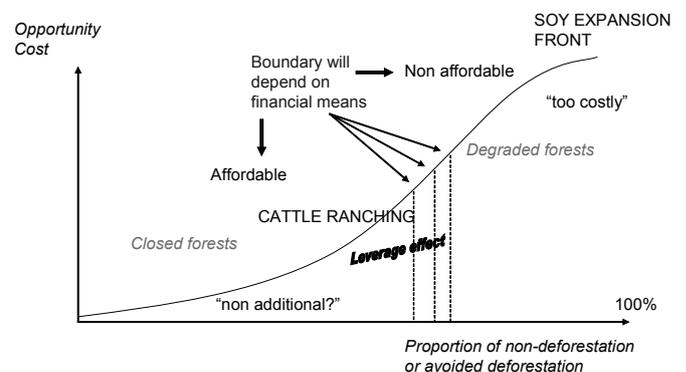
One of the major advantages of the Fund option is that it allows channelling money to local stakeholders whilst most carbon-market REDD architectures imply rewarding the

national government at the end of the commitment period and leaving payments of local stakeholders to governmental discretion. Brazilian states such as Mato Grosso and Amazonas have launched ambitious PES programmes, also known as REDD projects, in order to compensate farmers who agree to reduce deforestation (ICV 2007). However, this does mean the additionality issue is automatically resolved with such PES schemes since, as Persson and Azar (2007:1296) point out about such programs in Brazil: “If compensation were to go out only for lands where forests are thought to be threatened by destruction, problems with creating baselines for deforestation and a risk of moral hazard, i.e., landowners claiming and threatening to clear land that would otherwise not have been cleared, would arise. If compensation on the other hand were to go out to all private land owners, the financial compensation offered would likely be too small to affect land-use patterns in any significant way”.

One can illustrate such a remark through the figure below: the leverage effect of such PES programmes is likely to be limited to the cases where the forest is effectively threatened and when the opportunity cost of keeping the forest is not too high. Yet on the other hand, some equity considerations will also take place: as noticed by Wunder (2007), the economic rationale, which is to pay only for threatened forest (additionality criteria), would exclude many traditional communities unable or unwilling to deforest. On the other hand, large landowners who could afford to slow down their deforestation rate (assuming no moral hazard), would benefit extensively from such payments. One must add that in Amazonas, few landowners comply with the obligation of keeping 80% of the forest on their properties. Ethical and legal considerations could not be neglected: paying landowners having cleared more land than allowed only for incentivising them to comply with the law is debatable, as pointed out by scholars from the Goeldi Museum in Belém¹⁸.

This issue also raises the question of the cost of avoiding emissions from deforestation, which the Stern review claims to be smaller than in other sectors (Stern 2006:540).

FIGURE 4 *Additionality versus affordability for REDD/PES schemes*



¹⁸ O Estado de São Paulo, 30 October 2007.

At what cost?

In a document presented at the Bali Summit, Laporte *et al.* (2007) tried to estimate the costs of curbing deforestation in DR Congo by 50%. Having estimated that rural households emit approximately 15.5 tons of carbon per year for 0.62 ha of clearing, they simulated the carbon price needed for compensating households would range from US\$ 300 to 1 000 per year. They concluded that the annual price of carbon would need to be between US\$ 19 and 65, which appears to be cheap for achieving large reductions. But is such apparent 'good news' credible? First, for people in a survival mode living in remote areas, such modest financial compensations are unlikely to cover the welfare losses associated with 50% of land clearing reduction in a subsistence economy that is only partially merchandised¹⁹. In addition, if households have to buy more imported food products to compensate a 50% loss of arable land, they will have to face a risk of inflation and, unless a permanent revision mechanism of compensating payments is designed and implemented, households will rapidly end up worse off (which would probably lead them to resume forest clearing).

Beyond such considerations, one can argue that such estimates – following those of the Stern review for avoided deforestation – do not distinguish between the opportunity cost and the full implementation cost of coherent and large-scale PES programmes. Simply matching the (modest) annual revenues of rural households deriving from land clearing in forest frontier areas with a carbon price on international markets is insufficient in achieving effective changes in the field. There are many intermediate (and costly) steps that involve programme building as well as all the institutional arrangements to prevent leakages and unavoidable opportunistic behaviour of agents (which are not so blameable when households earn less than US\$ 1 a day). In concrete terms, such schemes will require costly expertise, project design, management, monitoring and other various transaction costs. Furthermore, one can foresee that those prices will increase exponentially with *scaling up*: in order to be sustainable, such operations will need significant change in current extensive farming practices ('slash-and-burn') which cannot be achieved without carrying out comprehensive support programmes which would include subsidizing fertilizers, training, credit schemes, etc.

BEYOND REDD, WILL FORESTS BECOME INTERNATIONAL PUBLIC GOODS?

Whatever the outcome of the current debate about REDD architecture, world forests – and especially tropical ones – have taken a prominent place in the global change agenda. The fact that debates are focusing on financial compensations

has generated new and evolving strategies from various large-forested Southern countries which could lead to some innovations in international relations regarding the status of some tropical forests.

Certain public declarations of developing country officials are calling for a generalization of financial claims for *standing forests*, *i.e.*, well beyond the concept of avoided deforestation. Yet, Indonesia wants to be paid US\$ 5-20 per hectare not to destroy its remaining forests (Reuters, 8 October 2007). Moreover, the (former) Minister of DR Congo declared that "we are ready to contribute to climate equilibrium but we demand \$3 billion [annually] for our forests to absorb the carbon dioxide emitted by industrial countries" (Xinhua, 2 October 2007). A few months earlier, Ecuador turned to the international community claiming that the country is willing to exploit oil reserves located beneath dense forest areas inside the 700,000-hectare Yasuní National Park unless they are compensated for foregoing oil revenue – a figure President Correa estimates at around US\$ 350 million per year (ENS, 24 April 2007). Last but not least, *The Independent* newspaper dated 24 November 2007 announced – under the title "Take over our rainforest" that Guyana has offered to give its entire rainforest to a British-led international body in return for development aid and expertise from the UK.

Despite the fact that some countries such as Brazil still firmly assert the strict sovereignty of the Amazon forest against what it perceives as attempts to "internationalize the Amazon", other developing countries seem ready to forego their long-lasting claim to the full ownership and rights to use the natural resources as they see fit. If such a phenomenon were to be generalised, forests would tend to correspond more to the International Public Good (IPG) definition, *i.e.*, goods whose provision or associated benefits spill over national boundaries. The UNDP also specifies that such goods "are non-excludable, and sometimes, also non-rival. They are there for all to consume"²⁰. So far, forests only display a few IPG characteristics, including some of the *services* they provide, such as carbon sinks and reservoirs and biodiversity reserves, but the *resources* they contain, such as timber, non-timber forest products and potential agricultural land, fall within national sovereignty instead and are subject to various local property rights. Only if forests were to be managed for rendering global services entirely remunerated by the international community rather than for the physical resources as they are today, then one could consider them as new IPGs.

Engaging on such a path could be tempting. Economists, after all, have long claimed that forests are destroyed because of 'market failures' which hampers the recognition and remuneration of their total economic value. However, there is a political (and financial) risk for potential 'buyers' who could be threatened as follows: "if you don't pay me I will

¹⁹ The authors only acknowledged this implicitly in a footnote: "the calculation presented here is a simple representation of transfer based on cash income and probably underestimates the true value of forest for the households" (p. 24).

²⁰ <http://www.undp.org/ods/r-whoseggp.html>

let my forests get cleared". Such a risk is already foreseeable at local level with PES programmes, making it difficult to concentrate payments only on 'objectively threatened forests' as recommended by Alix-Garcia *et al.* (2003) in the name of efficiency. This could become a demand of developing countries at global level.

Yet financial rewards (to governments) for standing forests *without regard for policies carried out* would be extremely costly, of doubtful effectiveness and also questionable from a global justice perspective: countries with abundant tropical forests are often not the poorest or the least-endowed in alternative natural resources, and rewarding them in proportion to their forested surface area could be considered unfair in relation to other countries struck by aridity and extreme poverty, such as in the Sahelian region. To avoid such *impasses* one needs to call for a principle of responsibility at three levels:

- Environmental responsibility must not be addressed to Northern countries only: the reverse side of the coin of the (uncontested) sovereignty of developing countries on their forest resources should be the responsibility vis-à-vis the forests as global environmental service providers;
- Industrialized countries have the responsibility to reward genuine efforts of governments and local actors. This cannot be contemplated without using commonly agreed conditionalities and strong evaluation of public policies implemented as well as their impacts; and
- Citizens, especially those of industrialized countries, must be aware that appropriate economic instruments can contribute to solving the problem but will not be sufficient to rescue rainforests if in-depth change in consuming patterns are not carried out; the ultimate solution (still) remains in the collective choices and both collective and individual behaviour: forests continue to be converted for cattle ranch expansion as well as biofuel and pulp and paper production which – at the end of the day – boils down to the issue of ever-increasing consumerism.

CONCLUSION

Markets instruments are very effective tools for achieving specific goals, such as improving efficiency of economic agents, but they will probably be unable to change the socio-political context underlying tropical deforestation. A successful market-based REDD mechanism would need a collective capacity to agree upon a baseline which would either take the form of a reference period in the past or a scenario which could be used a convincing projection of the future trends of deforestation. Unfortunately, there is little chance that the future resembles the past; robust predictions of future deforestation seem unlikely given the complex interactions of factors commanding the pace of deforestation, especially as most of them lie outside the forest sector. The

unexpected and sharp increase in deforestation in Brazil as a direct consequence of the worldwide sudden rise of food prices should remind us that scenario(s) should not be confused with predictions. Even if baselines are rejected in favour of agreed national quantitative targets of deforestation, disentangling the impact of genuine efforts by governments from random events – needed to assess the additionality of emission reductions – will be often impossible. The various methodological refinements proposed to attenuate those difficulties have failed to provide satisfactory ways of overcoming this fundamental stumbling block, and have introduced complexity within a scheme whose initial quality was simplicity.

There is also confusion about incentives. Governments are not mere economic agents adapting their behaviour to a relative price system, as is implicitly assumed in market-based REDD proposals. States' decisions and policies are influenced by more complex processes, especially when governments do not act according to the collective interests of their country. As for weak and failing states, the capacity of governments to adopt and implement policies capable of curbing deforestation is extremely limited. However, even a weak government has the ability to influence the international negotiation process and urge for rules which maximize its expectation of being rewarded, regardless of its policies and measures during the commitment period. This has definitively turned REDD negotiations into an issue of political economy, rather than a technical one which could be resolved through delegation to a narrow group of experts.

The risk of a market-based REDD scheme is that it could generate huge amounts of "non additional" carbon emission allowances which would flood the main carbon market and ruin collective efforts to maintain a sufficiently high price of emission permits in the energy and industrial sector. To prevent this risk, one should look at other REDD architectures in which rewards will not be based on emission allowances for Annex I countries. An international Fund aiming to support policies and measures needed to tackle deforestation and degradation would be a more appropriate tool – and the only solution should action be financed immediately rather than probably at the end of the second commitment period. Financial support should be targeted in priority towards local actors causing deforestation or protecting the forest. Structural measures targeting land tenure systems, agricultural organisation and practices, along with good governance, should be supported as providing long term collective benefits with respect to forest cover but also livelihoods, even though the short term impact on avoided deforestation might not be straightforward and easily quantified. Reducing deforestation is socially and politically costly. It will need early funding to launch reforms, to compensate potential 'losers' and maintain efforts over time. This will require linking financial terms to agreed conditionalities regarding reform contents and measures implemented. Such changes would have to be completed by large "payment for environmental services" schemes targeting local stakeholders. Their implementation will be challenging (additionality issue) and probably much

costlier than predicted by the Stern Review which considered only opportunity costs and overlooked implementation and monitoring costs of such programmes. Yet they probably represent the only possibility to curb deforestation in a way that is socially and economically acceptable to the populations of poor and developing countries.

Whatever the outcome of the current debate about REDD architecture, the international status of tropical forests is probably going to evolve. Large forested countries have already gone beyond "avoided deforestation" and are demanding financial rent for global services provided by standing forests – whatever the policies conducted. If such claims were satisfied in the future, it would bring tropical forests closer to the definition of International Public Goods. However, it would not guarantee more effective protection. Finally, one must be aware that appropriate economic instruments can contribute to tackling the deforestation problem but will not be sufficient to rescue rainforests if in-depth changes in collective and individual consuming patterns are not carried out at a global level.

REFERENCES

- ALESINA, A. and DOLLAR, D. 2000. Who gives aid to whom and why? *Journal of Economic Growth* 5 (1): 33–63.
- ALIX-GARCIA, J., de JANVRY, A. And SADOULET, E. 2003. Payments for Environmental Services: To whom, for what, and how much? <http://gspp.berkeley.edu/programs/docs/PES.pdf>
- ANGELSEN, A. and KAIMOWITZ, D. 1999. Rethinking the causes of deforestation: lessons from economic models. *The World Bank Research Observer* 14 (1):73-98
- ANGELSEN, A. 2007. Forest Cover Change in Space and Time: Combining the Von Thünen and Forest Transition Theories. World Bank Policy Research Working Paper N° 4117, World Bank, Washington D.C . www.cifor.cgiar.org/publications/pdf_files/cop/REDD_paper071207.pdf
- BROWN, S., ACHARD, F., BRAATZ, B., CSISZAR, I., FEDERICI, S., De FRIES, R., GRASSI HARRIS, N., HEROLD, M., SCHILLER, S., MOLLICONE, D., PANDEY, D., SHOCH D. and SOUZA Jr., C. 2008. Forthcoming. Reducing greenhouse gas emissions from deforestation and degradation in developing countries: a sourcebook of methods and procedures for monitoring, measuring and reporting. GOF-C-GOLD Project Office, hosted by Natural Resources Canada, Alberta, Canada
- CHOMITZ, K.M., BUYS, P., De LUCA, G., THOMAS, T.S., and WERTZ-KANOUNNIKOFF S. 2007. At loggerheads? Agricultural expansion, poverty reduction, and environment in the tropical forests, World Bank Policy Research Report. The World Bank, Washington D.C.
- COLLIER, P. and DOLLAR, D. 2004. Development Effectiveness: What Have We Learnt? *The Economic Journal* 114 (496): 244-271
- DUTSCHKE, M., SCHLAMADINGER, B., WONG, J. L.P. and RUMBERG, M. 2004. Value and Risks of Expiring Carbon Credits from CDM Afforestation and Reforestation. HWWA Discussion Paper No. 290. Available at SS RN: <http://ssrn.com/abstract=576904>
- FBOMS 2005. Relação entre cultivo de soja e desmatamento - Compreendendo a dinâmica.Grupo de Trabalho em Florestas do Forum Brasileiro de ONGs e Movimentos Sociais (FBOMS). Sao Paulo
- FOODY, G. M. 2002. Status of land cover classification accuracy assessment. *Remote Sensing of Environment*, 80, (1), 185-201 . (doi:10.1016/S0034-4257(01)00295-4)
- GEIST, H.J. and LAMBIN, E.F. 2001. What drives tropical deforestation? LUCC Report Series n° 4, University of Louvain, Louvain-la-Neuve.
- GRAINGER, A. 2007. The influence of end-users on the temporal consistency of an international statistical process: the case of tropical forest statistics, *Journal of Official Statistics* 23 (4): 553–592
- GRAINGER, A. 2008. Difficulties in tracking the long-term global trend in tropical forest area, *Proceedings of the National Academy of Sciences of the USA*105 (2): 818-823. www.pnas.org_cgi_doi_10.1073_pnas.0703015105
- HYDE, W.F, AMACHER, G.S. and MAGRATH, W. 1996. Deforestation and Forest Land Use: Theory, Evidence, and Policy Implications. *The World Bank Research Observer* 11 (2)
- HYDE, W.F. 1998. Deforestation and Forest Land Use: a Reply. *The World Bank Research Observer* 13 (1) Washington D.C.
- HYDE, W.F., NEWMAN, D.H. and SEDJO, R.A. 1991. Forest Economics and Policy Analysis. An overview. *World Bank Discussion Papers*. N° 134.
- HYDE, W.F., BELCHER, B. and XU, J. (eds). 2003. *China's forests: global lessons and market reforms*. RFF, Washington and CIFOR, Bogor
- IBGE 2008. Base de Dados por Estado. www.ibge.gov.br/estadosat/perfil.php?sigla=mt
- INPE 2008. Projeto DETER. www.inpe.br/ingles/news/noticia.php?Cod_Noticia=1318
- ICV (INSTITUTO CENTRO DE VIDA) 2007. Potential of Avoided Deforestation in the Brazilian Amazon - Mato Grosso State case study, preliminary results. Presentation at the IDB, Washington, June 7, 2007.
- KAIMOWITZ, D. 1996. Livestock and Deforestation in Central America in the 1980s and 1990s: A Policy Perspective. CIFOR, Jakarta.
- KANNINEN, M., MURDIYARSO, D., SEYMOUR, F., ANGELSEN, A., WUNDER, S. and GERMAN, L. 2007. Do Trees Grow on Money? The implications of deforestation research for policies to promote REDD. CIFOR, Jakarta.
- KARSENTY, A. 2007. Questioning rent for development swaps: new market-based instruments for biodiversity acquisition and the land-use issue in tropical countries. *International Forestry Review* 9(1): 503-513.
- KARSENTY, A. and GOURLET-FLEURY, S. 2006. Assessing sustainability of logging practices in the

- Congo Basin's managed forests: the issue of commercial species recovery. *Ecology and Society* 11 (1): 26. <http://www.ecologyandsociety.org/vol11/iss1/art26/>
- LAPORTE, N., MERRY, F., BACCINI, A., GOETZ S., STABACH, J. and BOWMAN, M. 2007. Reducing Emissions from Deforestation and Forest Degradation (REDD): Reducing CO₂ emissions from deforestation and degradation in the democratic republic of congo - A first look. A report for the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP), Thirteenth Session, 3-14 December 2007, Bali, Indonesia. Woods Hole Research Center, Falmouth, MA.
- LEACH, P. 2008. Carbon Sunk? The potential impacts of avoided deforestation credits on emissions trading mechanisms. The Rain forest Foundation UK. www.rainforestfoundationuk.org/files/Carbon%20Sunk%20Report.pdf
- CHOMITZ, K and LECOCQ, F. 2004. Temporary sequestration credits: an instrument for carbon bears? *Climate Policy* 4 (1): 65-74
- MICHAELOWA, A. and RAWAT, V.R.S. 2007. CDM afforestation and reforestation baseline methodologies: An analysis of the submission and approval process, HWWI Research Paper 4-9, Hamburg Institute of International Economics Research Programme International Climate Policy. www.hwwi.org/uploads/tx_wilpubdb/HWWI_Research_Paper_4-9.pdf
- NIESTEN, E. and RICE, R. 2004. Sustainable forest management and conservation incentive agreements. *International Forestry Review* 6 (1): 56-66
- ÖSTERBERG, T. 2002. Designing viable land administration systems. Proceedings of World Bank Seminar on Land policy, Kampala
- PERSSON, U. M. and AZAR, C. 2007. Tropical deforestation in a future international climate policy regime - Lessons from the Brazilian Amazon. *Mitig Adapt Strat Glob Change* 12:1277-1304
- PIRARD, R. and KARSENTY, A. In press. Should "Avoided Deforestation" Be Rewarded? *Journal of Sustainable Forestry* 28 (3-4), Special Issue: Financing Forest Conservation - Payment for Environmental Services in the Tropics.
- PLATTEAU, J.-P. 1992. Land reform and structural adjustment in sub-Saharan Africa: controversies and guidelines, In: FAO Economic and Social Development Paper N° 107 / Rome (Italy), FAO, 332 p.
- PLATTEAU, J.-P. 2000. Allocating and Enforcing Property Rights in Land : Informal versus Formal Mechanisms in SubSaharan Africa, *The Nordic Journal of Political Economy*, (26) 1:55-81.
- PRINS, G. and RAYNER, S. 2007. Time to ditch Kyoto. *Nature* 449: 973-975
- PRIOR, P., O'SULLIVAN, R. and STRECK, C. 2007. A carbon stock approach to creating a positive incentive to reduce emissions from deforestation and forest degradation, CISDL & GPPI. http://climatefocus.com/newspubs/downloads/CISDL_and_GPPI_UNFCCC_Submission-Carbon_Stock_Approach.pdf
- RODRIK, D. 1989. Promises, Promises: Credible Policy Reform via Signalling. *The Economic Journal* 99 (397): 756-772
- SANTILLI, M., MOUTINHO, P., SCHWARTZMAN, S., NEPSTAD, D., CURRAN, L. and NOBRE, C. 2005. Tropical deforestation and the Kyoto Protocol. An editorial essay, *Climatic Change* 71: 267-76.
- SCHLAMADINGER, B., CICCARESE, L. DUTSCHKE, M. FEARNSIDE, P.M., BROWN, S. and MURDIYARSO, D. 2005. Should we include avoidance of deforestation in the international response to climate change? In: MURDIYARSO, D. and HERAWATI, K. (eds.), Carbon forestry: who will benefit? Workshop Proceedings "Carbon sequestration and sustainable livelihoods", CIFOR, Bogor, 26-41.
- SIST, P., SHEIL, D., KARTAWINATA, K. and PRIYADI, H. 2003. Reduced-impact logging in Indonesian Borneo: some results confirming the need for new silvicultural prescriptions. *Forest Ecology and Management* 179(1): 415-427
- SIST, P., FIMBEL, R., SHEIL, D., NASI, R. and CHEVALLIER, M.-H. 2003. Towards sustainable management of mixed dipterocarp forests of South-east Asia: moving beyond minimum diameter cutting limits. *Environmental Conservation* 30 (4): 364-374
- SOEYA, Y. 2003. Kyoto Protocol as a Diplomatic Issue. Research Institute of Economy, Industry and Trade (RIETI). www.rieti.go.jp/en/papers/research-review/010.html
- STERN, N. 2006. Stern Review on the economics of climate change. http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm
- TARAVELLA, R. 2007. L'impact de la création d'aires protégées en contexte pionnier d'Amazonie brésilienne: le poids de l'enjeu foncier. *Vertigo - La revue électronique en sciences de l'environnement*, Hors Série 4. www.vertigo.uqam.ca/hors-serie-4/hors-serie4_chap_3/vertigo_hors_serie_4_taravella.pdf
- VANCE, E. 2005. CDM Afforestation/Reforestation Project Methodologies and Rejections: Can an Industrial Project Succeed? Presentation at the WBCSD-ICFPA Side-Event of the UNFCCC CoP 11 (Montreal) www.wbcd.org/DocRoot/RtoA2mQAA2Mlp89MULut/vance.pdf
- WUNDER, S. 2007. The Efficiency of Payments for Environmental Services in Tropical Conservation. *Conservation Biology* 21 (1), 48-58 doi:10.1111/j.1523-1739.2006.00559.x
- XIMENA RUBIO ALVARADO, L. and WERTZ-KANOUNNIKOFF, S. 2007. Why are we seeing "REDD"? An analysis of the international debate on reducing emissions from deforestation and degradation in developing countries". Analyses n°02. Iddri, Paris. www.iddri.org/Publications/Collections/Analyses/An_0702_Rubio&Wertz_REDD.pdf