



Does the Opportunity Cost Approach Indicate the Real Cost of REDD+ ?

Rights and Realities of Paying for REDD+

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The mission of the Rights and Resources Initiative is to promote greater global action on pro-poor forest policy and market reforms to increase household and community ownership, control, and benefits from forests and trees. RRI is coordinated by the Rights and Resources Group, a non-profit organization based in Washington D.C. For more information, visit www.rightsandresources.org.

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1

INTRODUCTION

There is international agreement to include REDD+¹ among the global climate mitigation strategies. REDD+ is widely supported for two main reasons: first because deforestation accounts for somewhere between 12 to 18 % of global GHG emissions, and second because addressing this problem is widely thought to be the low-cost option to curtail CO₂ emissions. In this paper we question whether the opportunity cost approach used in most of the major global climate change studies covering REDD opportunities² provides realistic estimates of payments actually needed to implement equitable and effective REDD+ programs.³

There is no question that in a well-functioning market economy opportunity cost provides a conceptually satisfactory indicator of the minimum amount that would need to be paid to forest owners or users not to deforest, under the assumption that a rational economic entity would want to be paid at least as much as the entity gives up by not deforesting.⁴ As a side point, in the particular case of REDD+, the additionality and non leakage criteria have to be met in order for opportunity cost or any other indicator of cost to be a meaningful indicator in determining justifiable payments for REDD.⁵ Since these criteria apply regardless of what measure of cost or needed payment is used, we do not delve further into them in this paper.⁶

While in theory and under certain real-world conditions opportunity cost provides a useful indicator of payments needed, we see a number of problems in using it in the main political, social and economic contexts faced in the tropical countries

that will be implementing REDD+.⁷ Relying on these estimates could lead us in the wrong direction and could discourage many potential supporters, once the real required payments and costs are recognized.⁸ Below we summarize some of the main contextual issues that need to be addressed in using opportunity cost indicators. The following paragraphs discuss the issues in detail. The final part of the paper refocuses the discussion on some of the other cost and institutional investment related issues that we need to focus on and address as the international community moves forward with REDD+.

First, opportunity cost may be inappropriate, e.g., in the case of illegal logging and other illegal activities that result in deforestation.⁹ Second, it may be inadequate in terms of understanding what payments are needed to halt deforestation, e.g., in cases where there are side payments being made or where decisions that lead to deforestation have been made for strong political reasons, or where the groups involved don't really understand what they would be promising and what their alternatives are, or where property and/or land use rights are not adequately defined.

Third, if one is not dealing with a well-functioning market system, it may be difficult to estimate opportunity cost correctly, e.g., in the case of slash and burn farmers or shifting cultivators that operate mostly outside established market systems. This is because it is *perceived* opportunity cost by the recipient that matters in terms of providing incentive not to deforest; and that might be

extremely high if *perceived* survival this coming year depends on deforesting and growing crops on the cleared land. The farmers may face a great deal of uncertainty as to what this payment not to deforest means. The nature of the aspirations of the poor to get themselves and particularly their children out of poverty, and their perceptions of what is needed to do so also comes into play here. There is a fairness issue that needs to be addressed.

Fourth, and related to the previous point, if major carbon offset markets develop, then the price paid to forest land owners not to deforest and thus create the offsets would be determined by the market and not the various opportunity costs of the various forest owners or potential users of the forest. In a well functioning carbon market, forest owners at the margin would get paid their perceived opportunity cost, while all others would be earning Ricardian rents above their various opportunity costs, since they would be lower than the market clearing price. If the actual value of REDD+ payments is to be anywhere near the value derived by aggregating across opportunity costs of various forest owners/users, then one needs to make the unrealistic assumption that there will be some sort of “discriminatory price tender” where everyone will bid their lowest acceptable price (i.e., their opportunity cost) to some discriminating entity that then will pay them that price.³⁰

There are many more potential issues that need to be addressed in developing realistic estimates payments and costs required for successful REDD+. For example, if there are perverse incentives that encourage deforestation, then they must be dealt with or built into the costs that need to be covered. Some twenty years ago, Binswanger (1991) argued strongly that efforts to curtail deforestation in the Brazilian Amazon were hampered by “... tax policies, special tax incentives, rules of land allocation and an agricultural credit system that all accelerate deforestation in the Amazon.” (p.1) While Brazil has addressed many of these distorting policies, some remain and need to be factored into calculations of what the realistic cost of reducing deforestation will be. Binswanger points out that

no matter how good the incentives are, there will be need for substantial investment in the strengthening of the enforcement of laws and regulations related to forest use and misuse. This point has been echoed by many since then (cf. Caldas et al 2010). The costs of policy reform need to be built into the bottom line estimates of what it realistically will cost to reduce deforestation.

There also is the question of how opportunity costs are estimated. As pointed out by Wertz-Kanounnikoff (2008), the two main approaches to estimating opportunity costs are empirical (global and local) models and global simulation models. Opportunity cost estimates vary widely, depending on which method is used. Wertz-Kanounnikoff concludes that: “The ‘true’ cost estimate is most likely to lie somewhere in between the values provided by the local-empirical models on the one hand (lower end) and global simulation models on the other (higher end).” (p.5) This point also is made by Pirard (2008a): “numerous interpretations of the opportunity cost concept coexist in the literature and in influential reports (e.g. Stern review), with differing estimated values for similar cases.” (p.512).

Finally, we have to remember that opportunity cost is not a static concept. It changes as market forces change, as technology improves, and as new technologies emerge. In the particular case of deforestation to open land for bioenergy crops, Persson and Azar (2010) point out that if the price of carbon increases so would the price of bioenergy produced from bioenergy crops that are responsible for a significant amount of deforestation. Land prices, in turn, also would go up, since the opportunity cost of not producing the bioenergy crop would increase. This relationship would continue up to the point where other renewable, non-land intensive energy alternatives would become competitive. Most of the existing studies do not add a dynamic perspective on how opportunity costs will change as relative demand and supply conditions for timber or products produced on cleared forest land will change (under the assumption of negligible leakage).

While these limitations on the use of opportunity cost for estimating payments required for

successful REDD+ are not new to most economists, they have not been discussed adequately and focused on in policy discussions on the likely real cost of REDD+. The same can be said about the costs of resolving equity and rights issues related to slash and burn agriculture and dealing with disputes over land rights and titles.

The basic point of this paper is that the contextual issues influencing the adequacy and appropriateness of opportunity cost as a proxy for payments required to get successful REDD+ can be major ones in most tropical developing countries; and resolving them can be expensive and time consuming. More assessment and discussion of these issues are needed. Without resolving them, the opportunity cost estimates could misguide us in terms of reaching the ultimate goal for REDD+.

The contextual issues relate to the institutional side of REDD+: to governance issues, to basic property and use rights in relation to the main drivers of deforestation and degradation, to links between REDD payments and leakages and “environmental blackmail,” to logistical problems (transactions costs) in making payments to forest owners and users, to problems of corruption and illegal activity, to the nature and size of the associated transactions, implementation and institutional investment costs required to make REDD work effectively, and to demand and market issues. They also relate very directly to questions of fairness and income distribution. In the words of one of our reviewers, “... the poor need to be compensated a lot less because they are, well, poor.”

2

DRIVERS OF DEFORESTATION, PROPERTY RIGHTS AND OPPORTUNITY COST

Widespread deforestation and degradation, particularly of tropical forests, is a well-recognized problem, as are the reasons why it takes place (cf. Geist and Lambin, 2002; Kaimowitz and Angelsen, 1999, Contreras-Hermosilla, 2000). In trying to understand the real costs required to change deforestation behavior, it's important to start with the question of what rights the forest owner, or user has. Unfortunately, this rather simple question is often very difficult to answer. To begin, forest rights fall into two categories: customary – the rights and systems of rights that are determined by local people – and statutory – the formal, legal, framework of rights that is embodied in local, national, or international, law. While the statutory framework is applied by government to all lands, it is often inconsistent with the customary system, and in many countries rights are not clear or may be contested. Thus, unfortunately, in most tropical countries there is a big “grey” area where people have some customary rights but the statutory rights are not clear or adequately defined.

This somewhat confused situation yields three different, and often overlapping, legal situations in which deforestation or degradation occurs: (1) land owners/users clearly don't have the statutory right to deforest (or have a limited right to make changes in land use, but not to deforest); (2) land owners/legitimate users clearly have the statutory right to deforest or change use on part or all of their land; or 3) land owners/users are occupying and using lands where legal property rights are unclear. In many cases, these are lands

that have been used for many generations under traditional rights regimes.

All three situations are illustrated by the current situation in the Brazilian Amazon where about 40 percent of the forest land is in the “grey area” category (*Terra devoluta*).¹¹ At the same time, and to Brazil's credit, some 35 percent of the land that was in this category has now been formally designated as indigenous territories or state and federal protected areas. In other forested countries such designated areas are scarce and the percentage of land in the unclear rights category is greater. While in the strictest legal sense these public domain lands may fit in category (1) above, in reality and in the context of lives and livelihoods on the ground, there is uncertainty. Thus, we include the third category: (3) land users under traditional rights regimes or in “direct action land reform” (DALR) settlements where clear, legal rights or titles to the land that they are occupying have not yet been defined or are unclear in legal terms, often because even the boundaries of such lands have not been delineated, particularly on the ground.¹² In many major forest countries, these lands are a major portion of the forest land that is of interest in REDD negotiations. Fortunately, a number of countries are aggressively moving to clarify property rights by providing legal rights or property titles to communities, indigenous peoples or individuals, or by establishing legal reserves, national forests, parks and so forth.

Below we examine the implications in each of the above cases in terms of using opportunity cost to estimate what it would cost to halt deforestation.

2.1

WHEN DEFORESTATION IS FORBIDDEN BY STATUTORY LAW OR ZONING REGULATIONS

The simplest case is where deforestation is forbidden by statutory law. The opportunity cost of deforesting and using the land for another purpose is not appropriate in this case, even though it could be calculated. If illegal commercial logging or deforestation for other commercial purposes take place, then the cost of improving the enforcement of the law generally should be the relevant cost for the government, not the opportunity cost to the persons undertaking the illegal activity. As the IWG-IFR (2009) report states,

...average or marginal private opportunity cost does not necessarily reflect the incentive required to the country to reach the emission reductions target. For instance, in some countries significant results could be achieved through improved law enforcement, which could be achieved with relatively low investment, much lower than would be needed for REDD+ to compete with illegal activities. (p.23)

Boerner and Wunder (2008) bring up the interesting example from the Brazilian Amazon where a combination of improved law enforcement and incentive payments might be required: “Brazilian forest retention standards require 50-80% of private property in the Amazon region to remain under forest. Although few farmers de facto comply with this requirement, REDD in these areas would legally not be additional. Conversely, restricting payments exclusively to legally convertible forests on private properties would dramatically reduce the scope for REDD. Some combination of improved command-and-control tools and incentives is probably necessary. (p.508).”

If one wanted to look at enforcing land use laws in a benefit-cost context, then, applying a

simple “with and without” calculation, the net benefit to the nation when it effectively enforces the laws, would in rough terms be equal to the losses avoided (i.e., the revenues and non market values of the forest that the nation otherwise would have lost due to the illegal activity) minus the additional costs of making enforcement effective. This might very well turn out to be a large positive number. Or it might be low or even negative, depending on whose viewpoint is taken.

In some cases, the political cost of containing vested interests and corruption that enables illegal logging could be perceived as extremely high for the government decision makers involved, even though it could yield collective net gains for nation as a whole. This is characteristic of the so-called “governments with private agendas” (Lafont, 2000) where prominent positions (including chances of being reelected) and personal enrichment of those in charge of the administration, depend on their capacity to redistribute riches into their networks and to give powerful economic interests access to natural resources. This phenomenon is well-known in development studies³³. It sometimes is related to the apparent insufficient absorptive capacity of recipient governments to effectively use ODA. The basic point is that numerous civil servants have no personal interest in meeting the conditions required for effective foreign aid disbursement (and doing needed reforms), but, conversely, they could be very active and innovative in designing ways for diverting public assets for their own sake. In such contexts, there are private opportunity costs – but not easy to calculate as they are hidden and illegitimate – and there are potential net collective gains (of tackling illegal activity). Many economists tend to ignore in their calculations such trade-offs between private opportunity costs (that are generally political costs) and potential public benefits.

2.2 WHEN REMOVAL OF FOREST COVER IS PERMITTED BY LAW

In cases where removal of forest cover, partial or total is permitted or required by law²⁴, opportunity cost is a good measure of what it costs society to reduce deforestation and the associated emissions of greenhouse gases. However, that does not mean that it effectively can be used as an indicator of the amount that governments will have to pay to entities to get effective, efficient and equitable REDD+ at a meaningful scale? The answer to this question depends on what kind of forest owner/agent and what socio-political and economic contexts we are dealing with. Are we dealing with (1) a government entity? (2) individual or collective groups of Indigenous Peoples, forest communities, and other entities that have clear legal rights to the forest lands they live on and they generally are outside or on the fringe of the formal market economy? (3) individuals or private partnerships that have clear title to their forest land and participate in the market economy? Or (4) a corporate entity with a fiduciary obligation to their stockholders to do what is best for their business, e.g., logging, commercial livestock, soy bean, biofuel, etc. corporations? In what follows, we look at each of these entities.

GOVERNMENTS

If we are dealing with a government agency that either directly or indirectly causes deforestation of lands in the public domain, it generally does so for a purpose. Thus, government may:

- be involved in resettlement or land reform and it gives forest land to landless poor people (and some not so poor). In order to take title to the land, the agency involved requires the settler to put a certain portion of the land into agriculture, which requires clearing the land.
- want forests cleared in some border areas and land settled for national security reasons;

- be giving out large concessions or land leases to domestic or international timber, oil or minerals companies to raise revenues for the country.
- indirectly cause deforestation by not having adequate manpower and technology to enforce bans on illegal logging or other illegal forest clearing.
- have officials that do not enforce laws against deforestation or forest degradation because there may be corruption and side payments involved.

In most of these cases, the relevant cost of incentives to change behavior and halt the deforestation depends on a host of factors other than the theoretically best alternative use for the forest land (i.e., the opportunity cost). For example, the basic opportunity cost for the government to reduce logging concessions would be equal to the various revenue streams that would be foregone from not giving out logging concessions or leases to companies. This may or may not be anywhere near the actual opportunity cost to the companies associated with the logging operations, particularly if the country is in a weak bargaining position (e.g., only one bidder). The contract price may be far below the theoretical opportunity cost, or a fair market value for the concession under conditions of competition.

As Karsenty (2007) points out with an example from Cameroon, the concession fees forgone would be just a part of the overall opportunity cost to the government. If the logs are processed in country by a foreign entity, then there are the loss of log taxes, mill employment and taxes, export taxes and fees, etc. These revenue and employment losses to the country can vastly overshadow the lost concession fees. The whole dynamics of converting natural resources into other forms of capital to be used in development enter the picture.

Grainger (1997) makes the point that many of the rich developed countries fueled their development by decimating their forests and converting

them into other forms of capital. Now their forests are being built back up through afforestation, reforestation and management. (Sweden and the United States are prime examples). Why should a nation that still has rich forest resources ignore this history and the social opportunity cost of not converting its forests into other forms of capital to fuel development? If corruption is not involved, and if the country is looking at its future in a development mode, it surely might come up with a different, much higher cost of opportunities foregone than the simple opportunity cost perceived by an individual or corporation merely looking at the net revenue forgone by not clearing its forest.

In some situations, such as when genuine politically driven development programs or land reform or national security purposes are involved, the government may have no interest in halting the process of orderly deforestation, regardless of what it tells the press and what the simple, first round opportunity costs happens to be. Such deforestation, often occurring for strong political reasons, is in many cases outside the practical reach of an international REDD program.³⁵ In cases where a government might be willing to redirect a land reform or settlement program, REDD costs might include, for example, ones related to finding alternative sources of income for settlers so they don't have to clear as much forest to gain their livelihood. Compensation of losers in the reform process also may be needed, particularly if equity and fairness criteria are of concern. The payments required might well go far beyond the production-foregone opportunity costs.

Karsenty's (2007) critical assessment of the different types of "rent for development swaps" that may be relevant (as in the above case of concessions) provides many other complicating factors in terms of developing a relevant cost figure for protecting forests. Thus, tropical timber operations often involve taking out only a few commercially valuable trees per hectare, leaving the remainder of the forest to grow (and sequester and store carbon). While over time the entire forest being selectively logged may disappear as new species become com-

mercial or as the land is cleared after initial logging to be used for agriculture or other uses, the initial value of the carbon loss avoided by halting logging may not be that large, and certainly not equal to the carbon loss that would occur with clearcutting of the forest. Also, if reduced impact logging (RIL) is used, one cost figure would apply. If RIL is not used another cost figure would apply, even if the same commercial volume is removed.

Karsenty also points out that in one case, where an area of intact forest has not already been let out to a company on contract, payments would only have to be made to the government. In other cases, a contract with a commercial entity may already have been made by the government, in which case payments would have to be made both to the entity to get them to give up the contract and to the government to cover the losses it would incur in terms of initial contract price and future revenues from timber taxes, fees, etc.

Corruption brings in several other complicating factors. In the case of government contracts for use of public forest land, if there are "side payments" to key decision makers, then it obviously becomes more complex in terms of the international community paying enough to halt the logging operations. It comes back to the question of "opportunity cost to whom?" This becomes a classic "carrot or stick" question. We come down on the side of the "stick" or better enforcement of laws against corruption and illegal activity. In many cases, achieving better enforcement will involve major initial incentive payments to governments in addition to technical support.

In addition, in the case of international REDD payments to governments, there is ample opportunity to not meet the additionality criterion, e.g., in the case of a misjudged baseline figure or when there is international "environmental blackmail." (For example, the government says it would be deforesting X hectares of forest per year, but actually would have deforested much less. Some suggest that this is the case with the recent Guyana agreement to limit its deforestation in return for sizable payments. (Cf. Lang 2009,). According to FAO

statistics, Guyana has had negligible deforestation between 1990 and 2005. A good indication in cases of suspected “environmental blackmail” might be the willingness of a relevant entity or government to take considerably less than a realistically calculated opportunity cost for deforestation.

INDIVIDUALS AND PARTNERSHIPS IN THE MARKET ECONOMY

If we are dealing with individuals or private partnerships that have clear title to their forest land, opportunity cost (OC) would be a relevant indicator as a starting point for the negotiations for REDD+ payments. However, in calculating and using OC or any other measure of payments required, the additionality criterion needs to be kept in mind. A lot of “environmental blackmail” could occur, or an inappropriate deforestation baseline might be used, resulting in payments to people who actually never had any intention of cutting down or degrading the forest on their land. McKinsey and Company (2009) acknowledged this additionality issue and its impact on the relationship between expected money transfers and opportunity costs:

A payment for ecosystems services' approach (...) could have very high inefficiencies; i.e. compensation is likely to go to some who would have not deforested in any case, increasing payment by a factor of between 2 times and 100 times” (p. 122)

Such a phenomenon has already been observed in Costa-Rica with the national PES program: “Some suggest the program has achieved modest reductions, others that the effect has been negligible (Pagiola, 2006; Pfaff, Robalino, and Sánchez-Azofeifa, 2006). The studies all agree that many landowners who received payments would have conserved their forest even without them and that the decline in Costa Rica’s national deforestation rates cannot be attributed principally to the payments” (Kaimowitz, 2007, p.). This situation seems unavoidable in PES schemes that deal mainly

with potential losses avoided, as there is a trade-off between sound assessment of the additionality criterion and transaction costs: ascertaining whether the landowners’ forests are really threatened (and providing a reasonable time frame for the likely concretization of this threat) is challenging, time-consuming and will be costly.¹⁶

Another category of individuals are those who participate in government land reform projects. They often come from the cities and towns and are in the market economy. They are given a tract of forest land to partially clear and use for agriculture, generally using more modern techniques than the traditional shifting cultivators and slash and burn farmers. In this case, it is government policy that needs to be changed, if indeed government wants to change its policies on frontier settlement and land reform. Again, opportunity cost in the traditional sense is not the relevant indicator of the resource needs to accomplish improvements (from a deforestation point of view) in such land distribution policies and programs. Rather, the underlying political pressures that are driving the policies and their implementation and political “opportunity costs” need to be addressed. This can involve substantial institutional and infrastructure investment costs. Although external financial and technical support may be required, the will and incentive to change such policies and programs must be internal for changes to be effective on a sustainable basis.

CORPORATIONS

If we are dealing with corporations publicly owned by shareholders, then, while opportunity costs (plus transactions and implementation costs) may be a good indicator of the resources needed, they may become inappropriate or irrelevant in the larger scheme of things, because public corporations have a legal, fiduciary obligation to their shareholders to keep operating as profitably as possible. Thus, unless corporate entities can be convinced (with money or new technology) to change their approach to their business (i.e., deforesting

and then putting the land to different uses), or convinced by purchasers boycotts³⁷ of the company's outputs from lands they have deforested, it almost can be guaranteed that leakage will take place, although it may be in another country and possibly by another entity trying to supply market demand. Applying the "additionality" criterion to the case of leakage, the theoretical opportunity cost for the land in question would not be relevant.

Even if one could convince the particular corporation involved to go into a different business or do things differently, as prices increase due to decreasing supply and unchanged or growing demand, incentives to get in the business would increase and there would be other producers entering the market in other countries or regions taking up the slack, some of them by deforesting and then producing the output not being produced by those paid off by the REDD program. As product prices go up so do the opportunity costs of not deforesting. Ultimately, we need to address the demand side, if we want to reign in deforestation for a given demanded global market traded output; either that or find ways to markedly improve productivity on existing, non forested land producing the output³⁸. Actually, both should be addressed!

In the case of legal timber extraction in the Amazon, stopping selective logging of valuable species can have a high opportunity cost. In this case there are some intermediate options that exist if the opportunity cost to the logger is higher than what is considered a reasonable incentive payment not to log. Boerner and Wunder (2008) suggest that in such cases: "one pathway is to offer payments for reduced-impact logging that minimizes carbon losses. A second would be a "log-and protect" strategy of extracting only the most valuable timbers and then setting aside the resulting secondary forests for strict conservation." (p.510). Since normally after logging the land often is then further deforested for agricultural or ranching development, the opportunity costs for those activities also would need to be accounted for if the logged over forest is to be protected from further deforestation. In such cases, Boerner and Wunder suggest that

"...governments might decide to tax income from private REDD agreements to make up for losses in productive activity, which would further increase total costs."

Obviously, if leakage is expected, either in the same country or in a different country, then the REDD program should not pay the corporation; and calculating the opportunity cost becomes irrelevant. The IWG-IFR report (2009) makes a significant and strategic statement about leakages in the context of the necessary conditions for REDD to work:

*"To be effective, the incentive structure must meet two criteria: (i) it must have **close to global coverage** – an incentive that is attractive for one country but not others is likely to lead to international leakage (simply displacing emitting activities to another country) and hence represent an ineffective use of scarce finances; (ii) the frameworks to address deforestation and degradation in developing forest countries must be **nationally coherent** – finance that is made available primarily on a project basis may cause domestic leakage and similarly lead to ineffective use of public and private capital."*(p.10, emphasis added)

These are sound criteria. Unfortunately, how to deal with them is not discussed further. They need to be addressed in much greater depth. Leakage could become a major concern, if not dealt with in international REDD+ debates.³⁹

With regard to leakages, it is not only large projects having a noticeable effect on the market that one needs to worry about. Murray et al (2004) point out that:

*It is commonly argued that small projects will have negligible effects on the affected markets and therefore generate little leakage. Our results suggest otherwise. **For small projects, leakage may be small in absolute terms, but it tends to be***

larger in proportion to the direct project benefit than a larger program...Thus, leakage outside the boundaries of even small projects should not be ignored. (Bold added).(p.24)

While their conclusions are based primarily on analysis of the U.S. market situation, one needs to be aware of this potential: Even small projects can have enough leakage to negate the justification for payments equal to opportunity cost if one takes the additionality criterion seriously.²⁰

In considering opportunity costs associated with corporations, one also has to consider the existence of perverse incentives and “opportunist opportunity costs” created by the baseline scenario itself. An illustration of the limited relevance in certain contexts of the “compensation or the opportunity costs” principle can be found in the recent DRC’s REDD + strategy (MECNT, 2009) drafted by a McKinsey consulting team. The report estimates that between 1.6 to 3 million hectares of forested lands in the DRC could be converted in the near future to industrial oil palm production (but no mention is made of any contract already signed). The report thus indicates a “potential mitigation lever” of 80 millions TCO₂ (i.e., 19 % of the total potential) in the implementation of the plantation in savannah areas instead of in forested areas (*“new [oil palm] plantations that would have been established on primary forests leading to 1.6 to 3 millions hectares deforested in the baseline scenario”*)[translation from French by the authors, emphasis added]. In such a case, the opportunity cost of this “mitigation option” is the difference between the net economic margin from the oil palm plantations if they were established on the primary forest (baseline) and the lower margin resulting from the “diversion” of future plantations on savannah areas, less suitable for such plantations.

In the same vein, compensation to logging companies is identified as another “mitigation potential lever” by the DRC report (MECNT, 2009). Although the current rate of legal harvest of com-

mercial timber is between 3 to 5 m³ on average per hectare in the DRC (vs. 60-80 m³ in dense forests in Indonesia), due to high operating costs (transport, “administrative” costs, etc.), the report foresees an increase to 15 m³ per ha around 2030 (baseline), a quite unlikely figure inasmuch as the current extraction rate in Cameroon (a country having structurally lower transport costs) is between 8-10 m³. The report states (without explaining why) that 15 m³ per ha would be “unsustainable”, and proposes a compensation for “reducing” (in the model...) the harvest rate from 15 to 10 m³ (a level considered as sustainable) and to compensate the foregone corresponding revenues. Besides the fact that, here again, one can consider that the baseline for 2030 adopted is extremely unlikely, it is amazing to see that (i) the report suggests to “compensate” companies that are currently profitable with 3-5 m³ per ha and which probably will be better off at 10 m³; and (ii) if 15 m³ would be “unsustainable” (which still has to be demonstrated), it sounds more appropriate to recommend that the government should set up a regulation capping the volume harvested per hectare. It would be a wiser and more responsible use of REDD funding²¹ and certainly less costly than using such financial incentives.

This is a case where the “mitigation option” (and the associated opportunity cost) has been artificially designed. As in the case of Guyana, the DRC baseline scenario²² is performative in the sense it assumes the action is (virtually) done, once stated (in the national report), alleviating all hurdles and implementation barriers. (Large-scale agro-investments have often failed in central Africa, as opposed to in Asia and South-America), and creating such a virtual mitigation potential could be construed by some to be close to setting up “environmental blackmail.” In addition, this illustrates how the perspective of being compensated for the “opportunity costs” (in a specific REDD architecture framework) creates perverse incentives: governments have interest to plan as much forest conversion as possible (in the name of the “economic rationality”) and the potential oil palm investors have the incentive to target huge tracts of dense

forests with the hope of receiving major financial compensation for not clearing the land.

Summing up the above discussion of use of opportunity cost for the four main groups of agents responsible for deforestation in situations where it is legal, it is evident that opportunity cost has served its purpose to get a lot of key decision makers interested in REDD+ possibilities because of the low resulting cost estimates. However, it also

is evident that these estimates probably will be of limited use as we move on to assess options for REDD+ in the context of national political realities, focused at the country, driver and agent of deforestation levels, and considering the reality of the socio-economic contexts and the quality of overall and forest governance in many of the tropical forested countries.

2.3

WHEN LEGAL PROPERTY AND USE RIGHTS HAVE NOT BEEN DEFINED CLEARLY AND ASSIGNED DEFINITELY TO GROUPS OR INDIVIDUALS OCCUPYING LAND

This third situation, in between the two extremes of legal right to deforest and legal prohibition against deforesting, involves a large area of forest in tropical countries and primarily the poorer and most disenfranchised segments of a society – indigenous peoples, forest communities, migrant or “slash and burn” farmers and so forth. Most of these groups also live largely outside the market economy and live under traditional group rules for land use rather than formal property laws. As mentioned above, there is a welcome trend towards converting traditional rights or de facto rights taken through “spontaneous” settlement into legal land use or property rights. (cf. Caldes, et al 2010 and Simmons et al 2010) As mentioned, while some 35 percent of the Brazilian Amazon public domain lands have been allocated legally to Indigenous Peoples and protected areas, there still is 40 percent of the public domain land where many poor and disenfranchised people live without tenure security and ownership and thus would not be in a position to participate in a carbon offset REDD market that requires compliance level carbon offsets (and thus legal rights to the forest land involved) in order to enter the market.

In fact, if REDD funding takes place through a market-based mechanism at a national scale,

where governments would receive carbon credits in exchange for reducing deforestation, it could end up seriously hurting people living on and using forest lands that are poorly defined in terms of legal use rights. These people at present are for the most part merely tolerated by governments because there is no other economically pressing demands on the land and moving them off the land would create pressing social and security problems and could involve major costs. With the incoming REDD funds, governments now could see some economic value in instituting coercive measures to have these groups stop any deforestation they are causing. Governments might establish preserves and not compensate adequately (the opportunity costs of) the groups that were using the land beforehand, thus creating a serious socioeconomic problem and a likely problem in terms of halting illegal use of the new preserves.

If governments pay these people anything to help protect public domain lands, it is unlikely to have much to do with their opportunity costs; and to be effective, payments most likely will need to include government investments in alternative sources of livelihoods and in community development²³.

If we should attempt to calculate opportunity costs and use them in designing compensation

and incentive payment schemes for these types of groups, we have to remember that it is perceived opportunity cost on the part of the potential recipient of a payment that matters in terms of them making a voluntary choice to deforest or not to deforest. In this case, it relates to, but definitely is not defined by the market value of what the occupiers of the forest land would have produced on the land in the way of food, materials to build shelters, firewood to cook their meals, and perhaps a few products to sell in local markets. How would we value these mainly non-market outputs per ton of carbon not released, particularly considering that the land might or might not be totally deforested, be abandoned in a few years, and possibly go back to forest? We would have to pay careful attention to the estimation of carbon losses over time from shifting cultivation or slash and burn agriculture. Many indigenous people farm or use the forest in agroforestry systems with very little disturbance of the large trees; and this is where most of the above ground carbon in a natural forest is stored.

More importantly, even if we could value their meager outputs foregone, giving the forest dwellers or farmers money equivalent to the market values of those outputs foregone wouldn't help them much: Assuming that they won't go elsewhere and practice their traditional slash and burn agriculture (i.e., we need to consider the likelihood of leakage and do something about it), where do they go to live? Where do they get housing, food, fuelwood, furniture, etc., and how much will those things cost, if they can find a place to purchase them? What are their alternative sources of livelihood? Will there be problems if they move to cities or towns where they can find the housing, food, wood fuel etc., that they normally get from the forest? What do they do with their lives? Their perception of their opportunity cost should include consideration of these questions plus the uncertainty associated with an unknown change in their lives. Even though they live with risks day to day, this new and different kind of uncertainty may be accompanied by fear of the unknown, which could raise their perceived "opportunity cost" or more correctly their required

payment significantly to voluntarily give up their way of life. Of course, governments can always force them to quit their migrant agricultural practices since in most cases they have no legal rights to the land they occupy. However, then a major social problem would be created and leakage would be much more likely. The costs of resolving such problems could be large.

In addition to the above problems with using opportunity cost as an indicator of compensation required for these kinds of land users, the transactions costs could be very significant: Setting up payment schemes for such groups could become a logistical nightmare with very high transactions and implementation costs, especially in "weak states" where institutions are ineffective and infrastructure is poor or nonexistent in forested areas. Let's imagine the cost of reaching remote areas in the DRC, negotiating and contracting with communities who will be prompt to compete for forest tenure since there is a new financial opportunity (conservation PES) at stake; and imagine trying to do an adequate job of monitoring, reporting and verification (MRV) in such a context. In many cases the local people are not organized, so there is no one central entity with whom to bargain for an appropriate REDD+ payment.

The bottom line is that, while these groups may have traditional rights to the land, if those have not been translated into modern legal rights, they would not be able to make legal agreements about the land and the forest on it. So they are at the mercy of the government and project supporters in terms of sharing in REDD+ funding. Fortunately, as mentioned, more and more countries are transferring legal rights to forest communities and indigenous peoples on demarcated lands, such as in the case of Brazil. However, in other countries, such as in West & Central Africa, not having undertaken the same process as Brazil, the perspective of "payments for avoided deforestation" schemes is likely to turn numerous current low-intensity disputes over land control into open and sometimes violent conflicts for the land (and the expected "carbon rents").

Preventing such conflicts, fixing them and initiating consensual mapping processes followed by land rights registration, appears a prerequisite for implementing large-scale PES payments in REDD schemes for the many millions of poor people who currently live on forest lands with poorly or non-defined legal use rights. Costs could be high and politically unpopular. However, they are a necessary part of implementing a successful REDD+ program involving the millions of people who live in legal limbo on public domain lands.

If fairness in treatment of such people enters into consideration, Then the “transition” or “transaction” costs involved would likely be substantial. Yet, even though these costs are mentioned by all, they do not seem to be adequately considered by many of the major studies looking at opportunity costs. For example, such costs are acknowledged but left out of the “mitigation costs” provided by McKinsey and Company (2009). Others explicitly recognize such costs. Grieg-Gran (2008) points out that in the case of Costa Rica, if one assumes “... that 50% of PES recipients have to contract intermediaries to help them with their applications, including these costs in the calculation would almost double the administration costs bringing them to US\$6 per ha at least for the first five years of a payment contract.” (p.9)

Since that estimate is for Costa Rica, which is institutionally and in terms of literacy one of the more advanced countries, this has to be taken as a lower bound figure. In the poorer countries there generally is an inverse relationship between the magnitude of the opportunity costs and the transaction and implementation costs: The lower the opportunity costs, the higher the transactions and long term implementation costs. Viana et al (2009, p.1) point out that “Juma (Forest Reserve REDD project) shows that significant expenditure is likely to be needed over and above the rewards to local communities and up to 40 per cent of the total costs to ensure that permanent emission reductions are generated.”

Karsenty (2007) points out that going after the often perceived lowest cost REDD options, such

as the slash and burn farmers, forest communities and indigenous peoples, risks perpetuating their poverty. In that sense, this mechanism risks imposing the role of biodiversity (and carbon) reservoirs on the poorest forested countries. This is certainly in exchange for some rent, but only a ‘poor man’s rent’ since the latter is calculated according to the ‘lowest cost’ based on compensations in under-developed countries and regions.

Actually, such an issue also is acknowledged by McKinsey and Company (2009 p.122): “Practical, political and ethical reasons are likely to disconnect compensation to potential deforesters from the opportunity cost. For example, transfers to forest people or the landless poor might need to exceed opportunity costs substantially...”. However, this lucid statement did not lead to a revision of their “mitigation cost curve”, nor soften their claim that “avoided deforestation from slash-and-burn agriculture, and avoided deforestation from cattle ranching, offer high potential abatement at a very low average cost of below € 2/ tCO₂e” (pp.120-121).

In the case where fairness, and traditional rights and cultural values of indigenous peoples and forest communities are respected and considered, the degradation of the forest can be reduced through use of REDD+ funds not only to pay these groups not to deforest, but also to: (i) increase productivity of the already cleared lands in such a way as to permit the farmers to stay longer on a given tract of land, (ii) find and create alternative sources of livelihoods, including outside the forest, and (iii) encourage development of more permanent settlements by clarifying legal rights to the land and titling land to the IPs, communities or settlers involved. Most of these options would involve public “investment costs” quite different from the opportunity and transactions costs normally calculated for this category of potential agents of deforestation. The institutional costs of resettling people, finding alternative sources of livelihoods for them, etc., have to be considered.

It would appear that opportunity costs are just the tip of the iceberg when it comes to estimating the real compensation that will have to flow into

tropical developing countries to implement effective, efficient and fair REDD+ programs. The institutional investment costs involved in governance

reforms can be significant and such reforms cannot be done overnight. Yet in many countries they are essential before REDD+ can be a success.

3

THE WAY AHEAD: HELPING GOVERNMENTS GET THE REDD+ RESPONSE FRAMEWORK RIGHT.

We are here that the emphasis at this point should be shifting – as it is in many organizations, from analyzing global costs and options to looking at design and implementation issues at the national level: (a) determining what actions are needed from governments on the policy and legal fronts to improve forest governance;²⁴ (b) developing alternative cross sectoral strategies and approaches (getting rid of perverse policies) to make REDD+ work, and (c) analyzing and assessing in depth the likely longer term institutional investment costs that will need to be incurred and where they will come from.²⁵ The above is not a novel suggestion. In fact, the latest major work on REDD+ coming out of CIFOR (Angelsen et al 2009) concentrates on “national strategy and policy options.” Such nationally focused themes as “Building REDD+ institutional architecture and processes” and “Enabling REDD+ through broad policy reforms” are covered in detail.

The Governance of Forests Initiative (2009, p.2) points out that there is both a need and an opportunity for good forest governance in REDD: “a REDD mechanism that does not address poor governance as a fundamental driver of deforestation poses a risk of reversing past progress on these issues. At the same time, the political momentum behind the REDD debate has the potential to create new incentives and stronger support for tackling some of the most entrenched governance problems.” Current writings on REDD and REDD+ almost all stress to a greater or lesser extent the need to focus on governance issues. Yet most of the available lit-

erature does not get into the subject of governance improvement in depth, and particularly not at the country level. Much more thinking and action in this area are needed.²⁶

This focus on improved forest governance also is supported by a recent survey of ongoing REDD demonstration and readiness activities (Wertz-Kanounnikoff and Kongphan-apirak, 2009). After assigning “governance scores” to countries involved in these activities, the authors conclude that: “None of the countries with REDD+ activities (except one in Latin America) have a high governance level score. Countries with low governance scores have a large share of REDD+ activities.” (p.8) Most of the investment in REDD+ so far has had little concern for the per unit opportunity costs involved. Rather it is government ODA funds determined on political grounds and is related to processes that will lead to “REDD+ readiness” in countries.

Wertz-Kanounnikoff and Kongphan-apirak conclude that “This leaning towards low governance environments offers opportunities to reduce current barriers to carbon finance for REDD+ by investing in measures to enhance governance (e.g. tenure reform, command-and-control). At the same time, governance investments or other non-PES policies can directly result in reduced emissions and, hence, function as direct instruments for REDD+.” (p.9)

The authors go on to make the important suggestion that, “especially in low governance contexts, policy makers, donors and other REDD+

investors could pay explicit attention to the potential of governance or other policy investments (e.g. enhanced enforcement of tenure rules and responsibilities) as a more cost-effective option than PES-type deals to directly reduce forest emissions.” (p.9)

The prerequisites for good governance are discussed elsewhere.²⁷ While good governance explicitly has to involve civil society and the private sector, the dominance of government in setting the course for governance reform in the context of the mix of institutions involved in most tropical countries is clear under present circumstances. Thus, the rest of this discussion focuses on the needed public sector tools and investments to support governance reform and guide REDD+ related activities undertaken by various entities in the private as well as public sectors.

There basically are three sets of policy instruments that governments have available to influence those who own or control forests. These become the implementing tools of good governance. One is laws and regulations that define rights and ownership and put limits on what one can and cannot do with forests, e.g., the establishment of forest preserves and various zoning tools; and it includes organization reform laws that deal with transparency, inclusiveness, and communication improvements. A second tool is fiscal mechanisms, e.g., taxes and payments that create incentives not to deforest and provide the source of funding for action. And the third is public management and investment, including investment in activities that help create markets for forest environmental services (PES type activities) and help strengthen local law enforcement, reduce corruption and other essential elements in good governance. The three sets of instruments are of course closely linked. A good REDD+ governance framework or architecture will draw on all three of these sets of instruments.

Some of the main options that need to be considered within each category include:

Laws and regulations:

- clarifying and legalizing existing traditional and undefined tenure and land use rights, both on paper and on the ground if a good cadastral system

is not already in place; redefining land use laws and policies, including zoning regulations, to create increased incentives not to deforest; establish more restricted use protected areas, preserves and conservation areas;²⁸

- improving the enforcement of forest laws and expanding the control of illegal forest activity and corruption;
- passing governance reform legislation that deals with transparency, inclusiveness and accountability;
- Rationalizing forest industry contracts for harvest on public lands and encouraging low impact logging where feasible;
- Getting rid of perverse laws and policies in other sectors that encourage deforestation; and developing laws that deal directly with intersectoral policies needed to control the relationships between the forest sector and those sectors that are linked to deforestation (e.g., agriculture, energy and mining, transportation, etc.).

Fiscal mechanisms – taxes and payments:

- stopping the subsidization of forest clearing and forest degradation via agricultural subsidies and tax incentives, public road building that opens up lands, etc., encourage restructuring of some industries and encourage the agriculture sector to improve productivity on existing agricultural lands in ways that take pressures off forest clearing;
- expanding micro credit programs and other incentives for villagers and communities to establish businesses that provide alternatives to forest destruction; encouraging, e.g., through tax incentives, certification of forest operations and the benefits that go along with certification;
- using fiscal mechanisms to encourage industries to source their inputs from companies that do not use unsustainable practices involving deforestation in producing those inputs;

Public management and investment

- investing in the institutional infrastructure needed to clarify and make property rights secure, and managing the process openly and fairly as the process is implemented.

- Investing in the design and distribution of fuel efficient stoves and charcoal production systems, given that a lot of forest degradation is due to wood fuel and charcoal demand;²⁹
- investing in education, extension, research and technology development that favors intensification of agricultural production on existing lands rather than newly deforested land, and that encourages longer productive use of given areas of land already deforested, e.g., in the case slash and burn or shifting cultivation agriculture.³⁰
- investing in plans, programs and procedures, including financing mechanisms beyond REDD+, to encourage and support forest rehabilitation and restoration (R&R), and reforestation and afforestation where appropriate as part of an overall attack on poor land use that contributes to poverty, carbon release or reduced sequestration capacity, and loss of biodiversity;
- investing to make sure that the co-benefits from REDD are fully realized. It is very conceivable that in given areas carbon benefits alone may not justify payments that would lead to less forest degradation and deforestation. However, when watershed, biodiversity and other benefits are added in, the total benefits may justify from an economic perspective adequate payment to change behavior;
- investing in development of effective and realistic approaches and procedures to ensure fair and transparent sharing of benefits from REDD; which means investing in clarifying and assigning property rights, development of participatory governance processes, involving local forest communities in decision making, etc;³¹
- Investing in climate adaptation measures that can lead to avoiding a speeding up of carbon losses from forests, e.g., reducing fire danger, expanded insect or disease early warning systems and controls, etc.

The public investment costs implied by the above suggestions mainly relate to improving governance and REDD+ “readiness,”³² in moving toward a participatory governance capacity and processes that can handle major REDD+ investments both through ODA funding and through carbon offset

markets and special programs designed specifically to support REDD activities. Each country needs to tailor its use of these instruments to its particular socioeconomic and political contexts. Above all each country needs to take ownership of its REDD+ readiness activities. Investment costs involved in such improvements can be quite high and quite variable country by country.³² However, such costs need to be incurred, since as mentioned most assessments of preconditions for effective REDD programs confirm that having good, participatory and fair governance is a prerequisite.³³

It is important to reiterate, as indicated above, that *investments in governance and other non-PES policies can act as direct instruments for achieving REDD+*. Governance improvements are a key element in the overall proposed framework for interim financing put forth by the IWG-IFR (2009). However, not nearly enough thinking and debate have been devoted to the subject and the size and nature of the investment that will be required to make needed improvements in different country situations. We need to focus more in depth on the institutional issues that are at the very heart of whether or not REDD+ will work in practice. And that will have to take place country by country. REDD+ is a “grand experiment” that will involve an iterative process of successive approximations as the associated institutional investment costs and governance issues become better defined and understood. Unfortunately, this is not a “one answer fits all” situation. Although countries can learn from each other and from accumulated experience, the “experiment” still will have to have a distinct nationally focused and owned result.

The real costs that emerge surely are going to be quite different from those estimated so far.³⁴ Some actual costs may seem to be lower than current estimates, especially when the so-called mitigation potentials are associated with baseline scenarios sounding more like environmental black-mail than objective and credible forecasts of likely deforestation.

Some costs likely will be much higher than calculated opportunity costs, especially when in-

investments for creating local economic alternatives that are able to pull poor forest and forest margin dwellers out of poverty are considered. Since fairness and poverty alleviation also are at stake, it appears that the debate on which cost estimates to use is not only a technical economic one, but also about how a world really committed to reducing deforestation **and** poverty (the first MDG) should evolve and proceed in the design of a global REDD+ program - favoring the “lowest cost” efficient carbon sequestration option or the one that also considers poverty reduction.

One bright light in the REDD efficiency- poverty trade-off is that in many cases it may turn out

to be a “win-win” one: “Although the unit costs of carbon abatement via REDD would most likely increase with efforts to integrate equity and poverty concerns, these increased costs need to be met in order to ensure the delivery of (REDD) project or programme outputs – indeed this expenditure is likely to be highly cost-effective.” (Olsen and Bishop 2009, p. iv). We agree with that assessment. The above suggestions hopefully contribute to moving along the path to understanding and making the “win-win” scenarios materialize.

REFERENCES

- Angelsen, A. (ed.) 2008. Moving ahead with REDD: . Issues, options and implications. Bogor, Indonesia: CIFOR. 156pp.
- Angelsen, A. with Brockhaus, M., Kanninen, M., Sills, E., Sunderlin, W. D. and Wertz-Kanounnikoff, S. (eds). 2009. Realising REDD+: National strategy and policy options. CIFOR, Bogor, Indonesia.
- Angelsen, A. and D. Kaimowitz (eds.) 2001. Agricultural Technologies and Tropical Deforestation. Bogor, Indonesia: CIFOR.
- Asia Sentinel. 2010. Trouble for palm oil. Article dated 07 January, 2010. http://asiasentinel.com/index.php?option=com_content&task=view&id=2227&Itemid=229
- Binswanger, H. 1999. Brazilian policies that encourage deforestation in the Amazon. *World Development*, Vol. 19, No. 7: 821-829.
- Börner, J. and S. Wunder. 2008. Paying for avoided deforestation in the Brazilian Amazon: from cost assessment to scheme design. *International Forestry Review* Vol.10(3): 496-511.
- Caldas, M. et al. 2010. Settlement Formation and Land Cover and Land Use Change: A Case Study in the Brazilian Amazon. *Journal of Latin American Geography* ,Vol.9(1)2010: pp. 125-144.
- Campbell, A., S.Clark, L.Coad., L.Miles, K. Bolt, and D. Roe. 2008. Protecting the future: Carbon, forests, protected areas and local livelihoods. *Biodiversity* 9 (3 & 4) 2008.
- Chabal, P. and J.-P. Daloz, 1999. *Africa Works: Disorder as Political Instrument*, Oxford/James Currey, Bloomington/Indiana University Press.
- Chharte A, Agrawal A (2009) Trade-offs and synergies between carbon storage and livelihood benefits from forest commons. *Proc of the Natl Acad Sci U S A* 106: 17667–17670.
- Contreras-Hermosilla, A., H. Gregersen and A. White. 2008. Forest Governance in Countries with Federal Systems of Government: Lessons and implications for decentralization. *CIFOR Forests and Governance Programme*. No.13/2008.
- Contreras-Hermosilla, A. 2000. The Underlying Causes of Forest Decline. *CIFOR Occasional Paper No. 30*, June 2000. Bogor, Indonesia: CIFOR
- Coad, L., A. Campbell, L. Miles, and K. Humphries. 2008. The Costs and Benefits of Protected Areas for Local Livelihoods: a review of the current literature. Working Paper. UNEP World Conservation Monitoring Centre, Cambridge, U.K.
- Eliasch, J. and Office of Climate Change, UK. 2008. The Eliasch Review: Climate Change: Financing Global Forests. H.M.Government, U.K. <http://www.occ.gov.uk/activities/eliasch.htm>
- Geist, H and E. Lambin. 2002. Proximate causes and underlying driving forces of tropical deforestation *Bioscience* 52: 2 (Feb 2002):. Pp.143-150.
- Ghazoul, J., R. Butler, J. Mateo-Vega and L. Pin Koh. 2010. REDD: a reckoning of environment and development implications. *Trends in Ecology and Evolution*. Volume 25, Issue 7, 396-402, 23 April. 7pp.
- Governance of Forests Initiative. 2009. The governance of forests toolkit (version 1): A draft framework of indicators for assessing governance of the forest sector. September 2009. <http://www.wri.org/gfi>
- Graham, J., B. Amos, and T. Plumptre. 2003a. Principles for Good Governance in the 21st Century. Policy Brief No.15– August 2003. Ottawa, Canada: Institute on Governance.
- Graham, J., B. Amos and T. Plumptre. 2003b. Governance Principles For Protected Areas In The 21st Century. Prepared for The Fifth World Parks Congress, Durban, South Africa. Institute on Governance in collaboration with Parks Canada and Canadian International Development Agency, June 30, 2003. Ottawa, Canada: Institute on Governance.

- Grainger, A. 1997. Compensating for opportunity costs in forest-based global climate change mitigation. In Sedjo, R., N. Sampson and J. Wisniewski (eds.) *Economics of Carbon Sequestration in Forestry*. 364pp. Boca Raton, Florida: CRC Press
- Grieg-Gran, M. 2008. The Cost of Avoiding Deforestation Update of the Report prepared for the Stern Review of the Economics of Climate Change. International Institute for Environment and Development
- Hansen, C., J. Lund and T. Treue. 2009. Neither fast, nor easy: the prospect of Reducing Emissions from Deforestation and Degradation (REDD) in Ghana. *International Forestry Review* Vol.11(4), 2009. Pp.439-455.
- Hatcher, J. 2009. Securing tenure rights as a forest-based climate change mitigation measure: Some costs and lessons to inform policy priorities. Draft, August, 2009. Rights and Resources Initiative.
- Hoare, A., T. Legge, R. Nussbaum and J. Saunders. 2008. Estimating the cost of building capacity in rainforest nations to allow them to participate in a global REDD mechanism. Final Report, 15 August, 2008. London: Chatham House. http://www.occ.gov.uk/activities/eliasch/Chatham_House_cost_of_building_capacity.pdf
- IWG-IFR (Informal Working Group on Interim Finance for REDD). 2009. Report Of The Informal Working Group On Interim Finance For REDD+ (IWG-IFR). October 27, 2009. Discussion Document. http://www.unredd.net/index.php?option=com_docman&task=doc_details&Itemid=&gid=1096
- Kaimowitz, D. and A. Angelsen. 1998. Economic models of tropical deforestation: a review. Bogor, Indonesia: CIFOR.
- Kaimowitz, D. 2008. The prospects for Reduced Emissions from Deforestation and Degradation (REDD) in Mesoamerica. *International Forestry Review* 10 (3): 485-495.
- Kanninen, M., D. Murdiyarto, F.Seymour, A. Angelsen, S. Wunder, and L. German. 2007. Do Trees Grow on Money?: The implications of deforestation research for policies to promote REDD. CIFOR: Bogor, Indonesia.
- 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* Vol.9(1), 2007: 503
- Laffont J-J. , 2000. Étapes vers un État moderne : une analyse économique, Conseil d'Analyse Économique, n° 24, La Documentation française, Paris, 117-149.
- Lang, C. 2009. Guyana's President Jagdeo launches "avoided threatened deforestation" scheme. REDD-Monitor, 2nd February 2009. <http://www.redd-monitor.org/2009/02/02/guyanas-president-jagdeo-launches-avoided-threatened-deforestation-scheme>
- McKinsey & Company, 2009. Pathways to a Low-Carbon Economy: Version 2 of Global Greenhouse Gas Abatement Cost Curve. www.mckinsey.com/client-service/ccsi/pathways_low_carbon_economy.asp
- MECNT (Ministère de l'Environnement, de la Conservation de la Nature et du Tourisme), 2009. Potentiel REDD+ de la RDC. December 2009, Kinshasa, DRC.
- Murray, B. 2008. Leakage from an Avoided Deforestation Compensation Policy: Concepts, Empirical Evidence, and Corrective Policy Options. Nicholas Institute for Environmental Policy Solutions, Duke University. Paper NI WP 08-02, June 2008
- Murray, B., R. Lubowski and B. Sohngen. 2009 Including International Forest Carbon Incentives in Climate Policy: Understanding the Economics. Nicholas Institute for Environmental Policy Solutions. NI R 09-03. <http://www.nicholas.duke.edu/institute> .
- Murray, B., B. McCarl and Heng-Chi Lee. 2004. Estimating Leakage from forest carbon sequestration programs. UWO Department of Economics Working Papers 2004-3. (available at <http://ideas.repec.org/p/uwo/uwowop/20043.html>).

- Nelson, A. and K. Chomitz. 2009. Protected Area Effectiveness in Reducing Tropical Deforestation: A Global Analysis of the Impact of Protection Status. Evaluation Brief 7. The World Bank, Independent Evaluation Group.
- Olsen, N. and J. Bishop. 2009. The financial costs of REDD: Evidence from Brazil and Indonesia. Gland, Switzerland: IUCN.
- Pagiola, S. and B. Bosquet, 2009. Estimating the Costs of REDD at the Country Level (Version 2.2 – 22 September 2009). Forest Carbon Partnership Facility. <http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/REDD-Costs-22.pdf>
- Pagiola, S. 2006. "Payments for Environmental Services in Costa Rica" Revised version of a paper presented at the ZEF-CIFOR workshop on Payments for environmental services: Methods and design in developing and developed countries, Titisee, Germany, June 15-18, 2005. Available at <http://mpra.ub.uni-muenchen.de/2010/>
- Persson, U.M. and C. Azar. 2010. Preserving the World's Tropical Forests: A Price on Carbon May Not Do. *Environmental Science and Technology*. Vol.44, No.1: 210-215.
- Pfaff, A., J.A. Robalino, and A. Sánchez-Azofeifa. 2006. Payments for Environmental Services: Empirical Analysis for Costa Rica. Columbia University.
- Pirard, R. 2008(a). Estimating the opportunity costs of 'avoided deforestation' (REDD): Application of a flexible stepwise approach to the Indonesian pulp sector. *International Forestry Review*, 10(3): pp. 512-22.
- Pirard, R. 2008(b). The fight against deforestation (REDD): Economic implications of market-based funding. *Idees pour le Debat*. No.20/2008. IDDRI.
- Ricketts T., Soares-Filho B, da Fonseca GAB, Nepstad D, Pfaff A, et al. (2010) Indigenous Lands, Protected Areas, and Slowing Climate Change. *PLoS Biol* 8(3): e1000331. doi:10.1371/journal.pbio.1000331. <http://www.worldwildlife.org/science/2010pubs/WWFBinaryitem15590.pdf>
- Schmidt, L. 2009. REDD from an integrated perspective : considering overall climate change mitigation, biodiversity conservation and equity issues. Discussion Paper 4/2009. Deutsches Institut für Entwicklungspolitik. Bonn : DIE.
- Simmons, C., Walker, R., Perz, S., Aldrich, S., Caldas, M., Pereira, R., Leite, F., Fernandes, L.C., and Arima, E. 2010. Doing it for Themselves: Direct Action Land Reform in the Brazilian Amazon. *World Development*, Volume 38, Issue 3, March 2010, Pages 429-444
- Stern, N. 2006. *The Economics of Climate Change: The Stern Review*. Cambridge University Press. (Pre publication version available for download at: http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm)
- Viana, V., M. Grieg-Gran, R. Della Méa, and G. Ribenboim . 2009. The costs of REDD: lessons from Amazonas. IIED Briefing, September 2009. www.iied.org/pubs/display.php?o=17076IIED
- Wertz-Kanounnikoff, S. and M. Kongphan-apirak. 2009. Emerging REDD+: A preliminary survey of demonstration and readiness activities. CIFOR Working Paper No. 46. Bogor, Indonesia: CIFOR
- Wertz-Kanounnikoff, S. 2008. Estimating the costs of reducing forest emissions: A review of methods. Working Paper No. 42, November 2008. Bogor, Indonesia: CIFOR
- Wunder, S. 2008. How do we deal with leakage. In Angelsen, A. (ed.) *Moving ahead with REDD: Issues, options and implications*. Bogor, Indonesia: CIFOR. 156pp.
- World Bank. 2009. *Roots for good forest outcomes: An analytical framework for governance reform*. Report No. 49572-GLB, Agriculture and Rural Development Department. Washington, D.C.: the World Bank.

ENDNOTES

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- ¹ Reduced Emissions from Deforestation and forest Degradation. The “+” is added on to include such things as forest restoration, reforestation and other forest related activities (including the vague concept of “forest conservation”) that can increase carbon sequestration and storage rather than just halting emissions. The scope of the “+” is under review, since there are substantial disagreements on what should be included.
- ² such as Stern (2008), Eliasch (2009), and most recently, the “Interim Financing for REDD” report by the “Informal Working Group” on interim financing (IWG-IFR, 2009). They use opportunity cost as a main indicator of the amount that would have to be paid to those who deforest to get them to halt deforestation or degradation. Most studies add on some modest transactions and implementation costs to arrive at estimates of the total institutional costs of implementing REDD+.
- ³ It recently was brought to our attention that a recently published paper by Ghazoul et al, 2010 raises a number of similar questions about opportunity cost in relation to compensation needed to achieve REDD+.
- ⁴ For a more technical discussion of the use of opportunity cost, see. Grieg-Gran 2008, Pagiola and Bosquet, 2009, Murray, Lubowski and Sohngen, 2009, and Wertz-Kanounnikoff, S. 2008.
- ⁵ If people are paid not to deforest when they had no intention of doing so, then the payments have no net impact in terms of REDD according to the additionality criterion; and if someone gets paid not to deforest 1,000 hectares in location X and then goes and deforests 1,000 hectares elsewhere to make up for it, then payments also have no net impact in terms of the leakage criterion.
- ⁶ See discussion of these criteria in Angelsen (ed). 2008, and Angelsen et al (ed). 2009.
- ⁷ We are by no means the first to find problems with the use of opportunity costs in a REDD context. Even the IWG-IFR (2009,p.23) recognizes that “*Opportunity cost – the income foregone by the alternative high-carbon activity – represents a good indication of the funding to be required to alter land use decisions, but it has many shortcomings.*” And Pirard (2008b, p.8) concludes that: “*although numerous studies are available to calculate the opportunity costs of avoided deforestation, in reality their utility seems very limited to forecasting what would be the financial requirement to act against deforestation.*”
- ⁸ In many cases, a main problem will be the time it takes to get acceptable systems of monitoring, reporting and verification (MRV) set up and to get adequate assurances of additionality. Cf. Hansen et al (2009).
- ⁹ Sometimes, the laws are inadequate or unenforceable and removing them can be more appropriate. In such a case, the use of economic instruments might be relevant, once the legislation has been changed.
- ¹⁰ We take note, however, of Boerner and Wunder’s (2008) suggestion that: “Experiments with inverse auction systems where producers ‘self-reveal’ their costs and preferences have progressed sufficiently to also pilot these techniques in the Amazon, thus validating ex-ante cost estimates and avoiding over- or underpaying individual farmers due to aggregation errors.” While we sympathize with the idea, we believe that practical application of such systems on a meaningful scale will only take place far in the future.
- ¹¹ Boerner and Wunder, 2008, citing Toni 2006. Terra Devoluta is defined in Brazilian law (Article 3, law 601 of 1850), as ““untitled, unoccupied government land not earmarked for public use.”
- ¹² Direct action land reform is a social and political process involving mobilization of the poor, the contentious occupation of public or private lands, and the formalization of land holdings in the wake of occupation (Simmons et al. 2010, as cited in Caldas et al, 2009).
- ¹³ See Chabal and Daloz (1999) for an illustration in Africa
- ¹⁴ E.g., in the cases where removal of a certain percentage of forest is required for people involved in land settlement programs to be able to take final title to the property.
- ¹⁵ Imagine asking the U.S. government to stop deforestation in the early nation building days when settling the country and developing its economy, was fueled in many areas by the capital derived from massive deforestation. The amounts of money

that would have been needed to stop that westward movement (and consequent deforestation) would have been astronomical, both in terms of opportunity costs (incentive payments) and in terms of enforcement costs. It probably would not have been of interest to the U.S. government for strategic reasons.

- ¹⁶ While “predictive” models can more or less anticipate *where* the next deforestation will take place (usually close to roads), they are incapable of telling *when* they will occur: this depends particularly on agricultural prices – and, incidentally, on the price of wood – which vary according to global market speculation.
- ¹⁷ It is interesting to note that Unilever, the largest user of palm oil recently suspended a \$31 million contract with a major Indonesian producer group until the group can prove that it is not contributing to deforestation. Producers are concerned that other North American and European buyers might join in the boycott. (Asia Sentinel, 2010).
- ¹⁸ As pointed out by Angelsen and Kaimowitz, 2001, some technologies reduce pressures to clear new forest, but others actually encourage expansion onto new forest land. Thus improvement in technology is not enough. It needs to be coupled with policies, laws and fiscal mechanisms that steer companies away from deforesting.
- ¹⁹ Murray (2008, p.27) suggests that “...the evidence suggests that leakage potential could be large and should be taken seriously by those charged with developing policy options.”
- ²⁰ More detailed discussion on leakage is provided by Wunder (2008), Murray (2008).
- ²¹ Without even speaking of the equity dimension vis-à-vis the poorest populations who will never understand how the government could “compensate” logging companies for not doing what they could have been doing in an hypothetical scenario...
- ²² Called “economically rational scenario” in Guyana by McKinsey and company which, like in the case of the DRC, prepared Guyana’s REDD strategy.
- ²³ Cf. Viana et al, 2009.
- ²⁴ Forest governance is defined here as (Contreras et al 2008): “the set of rules and institutions that control and determine what happens to a nation’s forests and who gains and who gets hurt as a consequence.”
- ²⁵ We note here that the Chatham House and ProForest prepared for the Eliasch Review estimates of “...the cost of building capacity in rainforest nations to allow them to participate in a global REDD mechanism.” (See Hoare et al, 2008). This assessment provides some order of magnitude estimates of initial institutional costs for the 40 rainforest countries thought at that time most likely to be included in early REDD activities.
- ²⁶ Groups such as the OECD and the World Bank also have major programs dealing with governance, (cf., www.oecd.org/dac/governance; World Bank, 2009
- ²⁷ The Institute on Governance (Graham et al 2003a) puts forth the following five generally accepted principles of good governance in general: legitimacy and voice, direction (strategic vision), Performance (responsiveness, effectiveness, efficiency); accountability and transparency, and fairness (equity and rule of law). See also Contreras et al, 2008; Governance of Forests Initiative, 2009; World Bank, 2009;
- ²⁸ A lot of evidence exists that indigenous peoples reserves and protected areas with active involvement of forest dwellers, contribute to protecting forests and avoiding deforestation. The literature was recently summed up by Ricketts et al 2010.
- ²⁹ Given various debacles in the improved wood stove field since it became fashionable about 1980, such added investment would have to be carefully planned. There also is the “rebound effect” - people cook more and more often once they get more efficient stoves, and so total consumption often in fact increases.
- ³⁰ One reviewer reminded us that if research leads to increases in productivity that in turn leads to increases in profitability (otherwise new improved technologies are unlikely to be adopted by companies and farmers), then the pressure to deforest may increase, not decrease, particularly if land is scarce. In Brazil where land is not terribly scarce, increased agricultural production through mechanization left many agricultural workers out of work. They invaded forests to survive as there were no realistic alternatives for them. Increased agricultural productivity can work both ways: less land is needed to produce a given level of output, but also, it will increase profitability and the propensity to expand those profitable activities to other lands. These other lands may be under forests. So, it depends. Research needs to be targeted and complementary policies need to be put in place.
- ³¹ In this regard, Coad et al, 2008, sums up the literature on this subject: “*Involving local communities in the planning and implementation of REDD, and ensuring that financial or other benefits are shared, is likely to result in a more sustainable solution to deforestation than are less participative strategies.*” See also Hatcher, 2009



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