Reduced Emissions from Deforestation and Degradation: taking stock of the social and governance dimensions

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Summary

Without addressing deforestation, climate objectives cannot be reached. Not only do forests have a role in the preservation of global ecological systems, they are especially important source of livelihood for local populations.

Reduced emissions from deforestation and forest degradation (REDD), which basic idea is to generate a significant level of compensation or economic incentive to outweigh the income generated through deforestation, emerged as a major climate change mechanism that has the potential to influence the governance of forest at the global level and to do so in a socially acceptable way. Concrete proposals Proposals for REDD are based largely on experiences related to PES programs.

But despite much scholarly and advocacy work, most literature has focused on technical issues, the prospective design of the scheme or normative opposition to it. We believe there is too little attention focused on the social (impacts on livelihoods and economic factors) and governance (institutional and norms-setting procedures at different levels) dimensions, and on the lessons learned from many years of intervening in developing countries' forests. For REDD to be socially acceptable by the 1.6 billion people dependent on forests, and to be a cost effective mitigation option for climate change, REDD needs to include a thorough reflexion on these aspects from the start.

This paper aims at critically taking stock of the existing literature on REDD and on early field experiences while focusing specifically on the social and governance dimensions.

[1] This draft is largely based on an earlier publication (Hufty, M. and Haakenstad, A. (2011). Reduced Emissions from Deforestation and Degradation: A Critical Review. Consilience. Columbia University. 5 (1): 1-24). It has not been presented in a conference until now. The present paper will be modified for the Conference to take into account the most recent literature.

Introduction

The services forests provide (regulation of bio-geo-chemical cycles, timber and non-timber forest products, biological resources) have convincingly been brought to light (MEA 2005a). Tropical forests harbour over 50% of the terrestrial biological diversity for only 6% of the world's surface (Wilson 1992). Forest also store 50% of terrestrial organic carbon for only 29% of the terrestrial surface (Schmitt et al. 2008). They obviously play a crucial role for the Earth and human beings.

But globally, sustainable forest management remains insufficiently competitive compared with more destructive uses (van Dijk & Savenije 2009): 13 million hectares are lost annually to deforestation (approximately the size of the United Kingdom) (FAO 2010), of which 97% takes place in tropical countries (Nabuurs et al. 2007). Carbon emission from feforestation annually contributes to 12-20% of greenhouse gas (Metz et al. 2007; Stern 2006). Deforestation also inflict high high biodiversity losses (MEA 2005b), and trigger the loss of key ecosystem services (Elmqvist et al. 2010).

Proximate causes of deforestation (infrastructure expansion, logging, conversion of land for agriculture and ranching, extractive industries, etc.), and underlying factors (economic aspects, such as the global demand for timber, soybeans or meat, as well as policy-related, institutional, technological, socio-cultural, demographic, etc.) are well known (Geist & Lambin 2001).

Many international mechanisms aimed at curbing deforestation are already in place.[2] They have proven useful under certain conditions, but manifestly insufficient if the global deforestation rate is considered (Humphreys 2006). No effective mechanism for forests governance was able to overcome the fierce opposition of developing countries on the basis of national sovereignty over their resources and their right to economic growth. Industrialized countries have only weakly backed the efforts for forests conservation and the resulting international forests (non) regime is segmented, fragmented, underfunded, and incoherent.

The recent efforts pursued under the Kyoto Protocol's Clean Development Mechanism, forest-related carbon sinks projects, have showed very modest results and have been widely criticized, among other aspects, for promoting "large monoculture tree plantations" (Kill et al. 2010). The "payments for ecosystem services" schemes related to forests have mainly focused on water provision (Gómez-Beggethun et al. 2010; TEEB 2010; Wallace 2007; Wunder et al. 2008), with the risk of oversimplifying the complexity and the multiple functions of forests (Kosoy & Corbera 2010).

Based on PES experiences and in the context of climate change, has emerged a new mechanisms aimed at generating a significant level of compensation or economic incentive to outweigh the income generated through deforestation (FoEI 2008: 9), the REDD mechanism, which has has the potential to influence the governance of forest at the global level and to do so in a socially acceptable way.

[2] Led by some major organizations such as WB, FAO, ITTO, etc.

REDD, a description

In the context of United Nations Framework Convention on Climate Change (UNFCCC) negotiations, 'avoided deforestation' was not originally included in its implementation agreement, the Kyoto Protocol. At the 11th Conference of the Parties, in 2005 in Montreal, a mechanism called 'Reduced Emissions from Deforestation and Forest Degradation' (REDD)[3] was proposed by developing countries[4]. Portrayed as a 'win-win' for developing and developed countries alike, the mechanism has gained momentum and support. It became a widely discussed subject in view of post Kyoto arrangements and it was in fact one of the few consensual solutions established by the UNFCCC negotiators in Copenhagen (CoP-15, 2009) and Cancún (CoP-16, 2010).

It has also generated such an abundant literature, academic papers[5], reports and advocacy papers, that it is illusionary to keep pace with. This is noteworthy for a mechanism that remains experimental, only due to start after 2012. Is there a chance for REDD to be "first attempt to manage forests at global scale" (Grainger & Oberteiner 2010)?

Influential reports have presented avoided deforestation as a "cost effective mitigation option for climate change" and a "significant development opportunity", since it would – in theory – provide additional financial resources for national governments and local communities to invest in health, education, and sustainable development (Chomitz et al. 2007; Eliasch 2008; Lubowski 2008; Murray et al. 2009; Stern 2006).

While the prospective costs of deforestation's contribution to climate change have been estimated at up to US$1-2 trillion annually (Eliasch 2008; Lubowski 2008; Tavoni et al. 2007), the annual costs for halving emissions from forest could range from US$ 7-33 billion, sums developing countries would receive for their efforts (Eliasch 2008; Kindermann et al. 2008; Torres et al. 2010). To attain these figures, models employ estimates of the opportunity costs of the timber, agricultural products, livestock and fuel production that drive deforestation (Chomitz et al. 2007;

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[3] The initial discussion was about 'avoided deforestation' (AD), which would have covered slowing deforestation rates in existing forests. In 2005, the discussion turned to 'Reduced Emissions from Deforestation in Developing Countries', with only one 'D' (RED). Gradually, the idea of including forest degradation was accepted and the acronym gained a second 'D' (Reduced Emissions from Deforestation and Forest Degradation). This was confirmed at Bali (UNFCCC CoP 13) in 2007. The 'Bali Action Plan' (Paragraph 1b.iii) also mentioned the role of conservation, sustainable management and carbon stock enhancement, an innovation that was dubbed REDD+. The debate on whether or not to include CDM's afforestation and reforestation (creating or re-creating a forest) in REDD is still ongoing.

[4] It was proposed by Papua New Guinea and Costa Rica. Papua New Guinea and Costa Rica in 2005. Reducing emissions from deforestation in developing countries: approaches to stimulate action. FCCC/CP/2005/MISC.1: UNFCCC.

[5] For 2010 alone, we have compliled over 60 papers in international peer-reviewed journals such as Science, Global Environmental Change, Ecological Economics, Environmental Science and Policy, Climatic Change, International Environmental Agreements, The Journal of Environment and development, etc. We therefore do not pretend to cover the entire literature base, but a selected sample.

Eliasch 2008; Lubowski 2008; Stern 2006). The message emanating from this body of work is that by preventing deforestation, global carbon emissions could be reduced significantly and at a lower cost, while simultaneously accomplishing important development objectives[6] (Eliasch 2008; Nepstad et al. 2009; Stern 2006; Sohngen and Sedjo 2006).

In general, REDD can be seen as being in continuity with PES, with several specificities, such as the scale at which it operates and the focus on the carbon stocking function of trees (while classical PES schemes may address different services and often focus on water). Indeed, while being more specific, proposals for REDD are based largely on experiences related to payments for ecosystems services (PES) programs.

However, the manner in which the REDD mechanism will be applied has been highly disputed. Many points of contention remain (Alvarado and Wertz-Kanounnikoff 2007; Angelsen 2008; Densham et al. 2009; FoEI 2008; Karsenty and Pirard 2007), which can be summarized as follows.

Funding. Several models are proposed (Karsenty 2008), on one side a specialized public fund (Brazil's proposal in 2006, also discussed by the Stern Review) (Grasl et al. 2003; Hoogeveen et al., 2008; Viana, 2009), on the other side a private, carbon market-based approach (ICF International 2009; Loisel 2008), or on a combination of both (hybrid or 'basket' approach) involving both public and private funds (Thies & Czebiniak 2008). Other concerns have involved prospects for long-term funding, phases of implementation, distribution and safeguards, and sensibility to carbon market variations (Brown et al. 2009; Minang & Murphy 2010). Under the current negotiations, it appears that the framework would use a hybrid approach, with capacity building funds available for start-up and linkages with the carbon market for scale-up (Minang and Murphy 2010; UNFCCC 2010; Verchot & Petkova 2009).

Scale. Different scales for implementation have been suggested as well. Under currently agreed terms, countries would report to an international funding mechanism (UNFCCC 2010), although the financial mechanism and the reporting system still have to be designed (December 2010 CoP 16 has deferred these sensitive issues to the next Conference of the Parties in Durban). The mechanism would mainly follow a 'national' or 'country-driven' approach: states will be responsible for the implementation of REDD within their borders according to the principle of national sovereignty (Anderson & Richards 2001; Plantinga & Richards 2008; UNFCCC 2010). This national model is another major difference with PES, mostly oriented towards local and regional projects or carbon sinks, financed by the market-based mechanisms of the Kytoto protocol. It would in certain versions allow compensations for the maintenance of protected forests. Concrete REDD projects would nevertheless be 'sub-national' (Santilli et al. 2005), which allows for projects to be established on a small scale at the outset (opposed to unified nationwide

[6] To keep things in proportion, official development assistance from OECD countries is expected to reach US$ 126 billion in 2010 (OECD 2010).

implementation). This combination is called the 'nested' approach (Angelsen et al. 2008; Pedroni et al. 2009). The scale of REDD has been linked to issues such as leakage, additionality, permanence, scope, baseline and monitoring, but also effectiveness, capacity and governance (Angelsen et al. 2008; Pedroni et al. 2009; Densham et al. 2009). The national approach poses problems for countries with weak governance capacities or institutions (Plantinga & Richards 2008), while a purely sub-national approach would risk leakage and raise questions such as to additionality and permanence (see below). Further questions, such as the relationship between a REDD carbon market and existing carbon markets, as well as to which specific entities should manage REDD funds and coordinate the many funds recently created (e.g. the Oslo-Paris REDD Partnership), and under what monitoring system, remain open.

Leakage, Additionality and Permanence. Leakage is a situation in which deforestation avoided in one area results in deforestation in another, whether within or between countries (Plantinga & Richards 2008). Leakages could severely undermine the effectiveness of REDD (Schwarze et al. 2003). Additionality is the idea that reduction in deforestation should be additional to what would have occurred otherwise. A related concern is permanence, the maintenance over time of forests and their carbon sequestration capacities (Dutschke & Angelsen 2008). Insurance policies, temporary crediting, shared liability, long term accounting, buffering and pooling of credits have been proposed to combat the possibilities of accidents like fires or pest invasion or incidences of deforestation once credits have been disbursed (Dutschke & Angelsen 2008; Olander et al. 2009).

Scope. The activities and forests eligible for financing are debated. The model presently accepted by UNFCCC parties is an enlarged version of REDD ('REDD +') that includes activities such as conservation, reforestation, afforestation and other forest enhancement activities rather than simply deforestation and forest degradation. As FAO's current definition would admit plantations as forests, at a national scale, a country could thus in theory increase its forest area through plantations while deforesting its standing old-growth forests simultaneously, thereby distorting some of REDD's environmental co-benefits, linked to biodiversity conservation and sustainable development (van Noordwijk & Minang 2009). As an answer to this concern, Paragraph 2(e) of the Annex I (Guidance and safeguards) of the Decision adopted in CoP 16 states that REDD actions should be consistant with the conservation of natural forests and not used for their conversion (UNFCCC 2010).

Baseline. Another concern in designing REDD has been determining the 'baseline' or 'a level of emissions that would occur in the absence of a forest carbon policy and is used as a reference case for quantifying mitigation performance' (Olander et al. 2009: 32). Baselines serve to assess the effectiveness of programs and allocating emissions reduction credits; they have thus been a source of contention (Olander et al. 2007). The use of historical deforestation to project deforestation rates (Sathaye & Andrasko 2007; Schlamadinger et al. 2005), or the use of 'business-as-usual' projections (Soares-Filo et al. 2006) have been critiqued as perverse incentives encouraging adverse selection – i.e. those historically responsible for

deforestation emissions are selected and rewarded rather than those who have historically left their forests intact (Plantinga & Richards 2008).

Monitoring. A consensus has emerged that emissions reductions should be measurable, reportable and verifiable (MRV) (Verchot & Petkova 2009), but verifying how much carbon is in fact sequestered and the effective reduction of deforestation is difficult. Lack of transparency (Anderson et al. 2009), over or under-estimations (Balzter & Shvidenko 2000), and the cost and accuracy of current technologies (Anderson et al. 2009; Murray et al. 2009) are limiting factors. Monitoring deforestation and degradation, and evaluating the carbon sequestered have greatly improved with remote sensing (DeFries et al., 2006; Gibbs et al. 2007), but many questions remain, such as who should certify REDD schemes, on what basis, with which techniques, and whether the capacity of developing countries to undertake the program's technical requirements and enforce restrictions is sufficient, even with capacity-building activities (Westholm et al. 2009).

Most of the vast and fast-growing body of literature has been dedicated to these questions, but it remains mainly prospective as relatively few field cases are available for early empirical assessment. In 2007 the UNFCCC called upon parties and international organizations to promote REDD through capacity building and demonstration activities. Consequently UNDP, UNEP and FAO created a program (UN-REDD) to help countries prepare themselves for implementing REDD. The World Bank also administers the Forest Carbon Partnership Facility (FCPF) to this end. This support has prompted the involvement of many new actors of different natures (NGOs, private firms, research networks) in REDD activities and the rapid emergence of REDD experiments at the sub-national level.

Wertz-Kanounnikoff & Metta Kongphan-Apirak (2009) have studied over a hundred of pioneer REDD projects underway, and differentiated between REDD-readiness activities (65 cases of legal and institutional preparation of national strategies) and 'demonstration activities' (44 projects implemented on a field level). Of the latter, half are concentrated in Indonesia (the country with the highest amount of greenhouse gas emissions sourced from deforestation) and they all are local and pioneer experiments.

One year later, Cerbu et al. (2010) surveyed 79 preparedness activities (national level) and a hundred demonstration activities (sub-national level), in 40 countries, but most took place in Brazil (17), in addition to Indonesia (22). They conclude that a bias exists for activities in Latin America to the detriment of Africa. Factors such as prior experience, the quality of partnerships, the perceived threat to forests and biodiversity, and the quality of governance determine where projects are established. Clearly, the number of REDD projects are growing rapidly, a rush that could be harmful for the eventual social and even environmental impacts. Additionally, the concentration of projects in specific regions could be detrimental to future design. If success is highly dependant on specific conditions, reproductibility upon scale-up and across different nations might not be feasible.

Governance and social aspects

The review of literature and research on REDD reveals there is clearly a gap on two issues: governance and social impacts. While governance and social aspects have been addressed in several studies and papers regarding REDD, a structured, balanced, systematic and evidence-based argument is still lacking.

Governance includes the design of the mechanism at all levels, norms-setting procedures, related legal and informal institutional arrangements, interactions between involved state and non-state actors, and horizontal (within a given level) as well as vertical (across levels) interlinkages with other issue-areas (e.g. biodiversity, finance, trade, etc.), existing policies and institutions at the international, national or local levels (Forsyth 2009; Minang & Murphy 2010; UNFCCC 2006). In general, forests are notoriously poorly governed (Hoogeven et al. 2008). During the last 10 years efforts to slow deforestation rates globally have had little success (Pfaff et al. 2004). Estimates contend that deforestation rates will continue in all geographic areas (Sathaye et al. 2007).

Much of the literature covering the governance of REDD relates to comparing the effectiveness, efficiency and fairness of the different proposed mechanisms such as scale (Clarke 2010; Kaimowitz 2008; Viana 2009), funding designs (Dooley et al. 2008; Viana 2009; Hoogeveen et al. 2008; Clarke 2010), monitoring systems (Lutrell et al. 2007; Peskett & Harkin 2007), the role of national forest policies, their risks, benefits and effectiveness (Funder 2009), the roles of state and non-state actors and the local scale as barriers and opportunities (Scriven 2009). While it appears that much of the 'what' related to governance may have been resolved, the majority of the 'how' is yet to be thoroughly investigated.

Governance capacities at the national level will be a key factor in the success of REDD (Peskett et al. 2008). A current significant concern relates to sending large sums of money to governments with poor track records, low institutional and governance capacities and weak commitments to transparency, accountability and participation (Peskett et al. 2008; Ebeling & Yasue 2008; Westholm et al. 2009). Some see REDD as an opportunity to strengthen forest governance, institutions and capacities (TNC 2009; Olander et al. 2009). But the capacity of REDD to produce such co-benefits has also been questioned (Bullock et al. 2009; Hall 2008; Livengood & Dixon 2009; REDD Monitor 2009).

When past experiences are examined, investing in governance institutions, engaging the local communities and addressing their needs has proven crucial to reducing deforestation in protected areas (Madeira 2008). In the PES programs implemented so far, which in some ways can be taken to indicate REDD impacts, there appears to be a bias against the poorest of the poor, although it is not clear whether this is due to correlation with other targeting criteria of the programs or to barriers to participation linked to poverty (Muñoz-Piña et al. 2008; Pagiola et al. 2007). Conflict over local and community land tenure, restricted access to forest resources, and unfair distribution of carbon revenues have been identified as possible consequences of poorly designed forest carbon programs (Olander et al. 2009). The effectiveness of PES schemes, conversely, have been shown to depend on an array of

factors that enhance the role of the poor, such as community involvement, institutional and economic drivers, and resources for surveillance and policing (Mertens et al. 2004). Ensuring co-benefits could thus result in more efficient and effective programs (Durbin 2007; Olander et al. 2009). A comprehensive, integrative approach with strong stakeholder participation may be more likely to address downfalls in REDD programs, as well as ensure success in terms of preventing carbon emissions. In effect, legitimacy can be seen as a condition for effectiveness.

In addition to governance, another central challenge for realizing REDD objectives is assuring social needs are also met and sustained alongside the conservation of forests. The reduction of the biodiversity of forest areas, for instance, is a critical concern for REDD. Biodiversity is already under threat, as recorded by the Millennium Ecosystem Assessment in 2005. The assessment concluded that, poor countries are not progressing in reaching the Convention on Biological Diversity (CBD) objectives of conservation and sustainable use of biodiversity. The loss of biodiversity deprives people of ecosystem services worth 250 billion dollars annually worldwide (MEA 2005) and ecosystem services and other non-marketed goods are estimated to account for 47 – 89 percent of the 'GDP of the poor' (TEEB 2009). Poor people are most critically dependent on well-functioning natural environments for their survival (Angelsen & Wunder 2003).

The need to seek synergetic solutions for diverse social-environmental challenges is recognised in report on The Economics of Ecosystems and Biodiversity (TEEB 2008: 16). The TEEB study concludes that investing in the restoration and maintenance of the Earth's ecosystems (valued at multi-trillions of dollars) – from forests and mangroves to wetlands and river basins – can have a key role in countering climate change while providing ecosystem services necessary for the sustenance and vibrancy of human life. The TEEB findings recognize that enhancing the resilience of ecosystems and maintaining the planet's biodiversity are key elements in the mitigation and the adaptation agendas, and are culturally and socially valuable to diverse groups of peoples (TEEB 2010). If REDD were designed to contribute to the conservation of biodiversity and ecosystem services by protecting vast areas of standing forest, it could contribute to guaranteeing long-held cultural practices and social benefits.

Aligning social and environmental goals to promote human well-being has always been and still is the weak link in implementing sustainable development and biodiversity conservation (GBO 2010) and REDD is no exception. The appeal of REDD for many of its advocates has been the prospect of significant 'co-benefits' for indigenous people and other forest dwellers in terms of development and livelihoods (Brown et al. 2008), but fears about local rights, unfairness, impacts on development, land use, livelihoods and food production have driven critiques of REDD (Griffiths 2007). Whether conservation and social goals can be achieved simultaneously is debated (Newmark & Hough 2000; Adams et al. 2004; Barrett et al. 2005). Many authors have recorded how local and indigenous people have suffered under previous conservation schemes, whether due to forced resettlement from protected areas (Adams & Hutton 2007; Agrawal & Redford 2009; Bray & Velazquez 2009; Colchester

1997; Dowie 2009; Krueger 2009; Schmidt-Soltau 2003), inadequate compensation for limitations on natural resource access (Peters 1998; Shyamsundar & Kramer 1996), or the exacerbation of local conflicts (Agrawal & Gibson 1999; Koch 1997). Also, evidence from benefit sharing schemes based on forest taxes or other revenues that were intended to be pro-poor have not been particularly successful (Bond et al. 2009), and have often not reached those intended to benefit (Bandyopadhyay et al. 2008; Egbe 2001; Frost & Bond 2008), or have had only modest impacts on livelihoods (Bond & Mayers 2009; Porras et al. 2008). Given this history, many questions and concerns related to the impacts of REDD have emerged, but most recent literature is composed of preventive denounciations and policy recommendations.

In responding to these concerns, research relies primarily on projections or hypotheses for the scheme, economic modeling, historical examples from PES or other conservation-development projects or the few empirical examples existing to date, notably the Noel Kempf Project in Bolivia (Densham et al. 2009; Griffiths 2007; TNC 2009). Because of these methods and the limited information available until now, much of the work related to these concerns simply raises many more questions than answers.

Gaps in the literature

The narrow breadth of literature covering the design of REDD means we are still at the stage of speculating how REDD will be governed and what prospective effects it will produce in terms of development, livelihoods, human rights and equity. These issues are critical, as an estimated 1.6 billion people, 60 million of which are indigenous people, depend on forests for their survival (CBD 2009; WB 2004). But as the literature stands now, much more information is needed in order to design REDD properly in these terms; little attention has been given to the social dimension of any of the proposals being made to address climate change and forest protection. Among the main social issues requiring investigation, rights, development and equity are prominent.

Rights, local and indigenous people and land tenure. Widespread concerns relate to the impact of REDD on local and indigenous people's rights, most particularly their right to land (Butler 2008; Castro Diaz 2008; Griffiths 2007; Peskett et al. 2008). Funder (2009) hypothesizes that the implementation of REDD could be good or bad for local peoples – in solidifying recognition for their right to land or in ignoring and abusing such rights. According to its promoters, the Noel Kempff project in Bolivia demonstrated that REDD can reinforce and augment certain customary property rights (TNC 2009). However, most of the literature questions this assertion. Weak land rights can potentially create or exacerbate local conflicts and leave local people open to being manipulated (Mayers et al. 2006). Cotula & Mayers (2009) lay out the complexity and variability of land tenure issues that will be affected by REDD, emphasizing the past failures of benefit sharing schemes associated with forests. Bond et al. (2009), similarly, look at PES schemes worldwide and observe their potential for weakening land and resource rights. The risk is that

REDD schemes may result in governments, companies, conservation NGOs or speculators carving up forest lands, and pursuing forest protection approaches that marginalize rather than empower forest people through the recentralization of forest governance (Phelps et al. 2010; Sikor et al. 2010) or in what have been known as 'land grabs' (Castro Diaz 2008; Griffith 2007; Peskett et al. 2008; Robledo et al. 2008). Land grabs and the re-zoning forest land by external actors without the participation of local people have been directly observed (Griffith 2007). Castro Diaz demonstrates how indigenous people have been left out of negotiations related to REDD projects (Castro Diaz 2008). The recent case of Pupua New Guinea further illustrates the importance of clear and enforced land rights (Melick 2010; Mongobay 2010; Palmer 2010). Weak land tenure and associated problems also potentially play a negative role in poverty alleviation, for if payments depend on owning land, it is likely that they will not go to mostly poor people, even if they go to poor areas (Kerr et al. 2004; Grieg-Gran forthcoming).

Development. There is a general hope that REDD funds could contribute to providing the resources needed for economic growth and development (Olander & Murray 2007). For Patanayak et al. (2009), for example, protecting forests in Brazil could reequilibrate the distribution of income, health and education in favor of rural residents. Watershed PES schemes have for example shown to have significant potential for impacting poverty (Bond & Mayers 2009; Bond et al. 2009; Porras et al. 2008). But this enthusiasm is tempered by many interrogations based on earlier experiences. At the macroeconomic level, several preoccupations are linked with the absorption capacity of some countries and the impacts of large sums of money on national economies. Implementing the program on a large scale implies opportunity costs and a reorientation of economic activities based on forest exploitation (Chomitz 1999; Chomitz et al. 2007; Grieg-Gran forthcoming). The dependence on one source of revenue, comparable to external aid, has been highlighted, as well as the danger of provoking 'Dutch disease' (the distortion of economy due to high dependence on one economic sector) (Peskett et al. 2008). The possible impacts on internal prices, for food or energy, could produce depressive macro employment effects (Bond et al. 2009) and be detrimental to the poorest communities. Ebeling & Yasue (2008) correlate Human Development Indicators (HDIs) with areas likely to benefit from REDD schemes and find that the program will most likely not target the regions with the direst human development needs. Griffiths (2007) further foresees an unequal imposition of costs for the protection of forests onto local communities and indigenous peoples, underlined and enforced by inequitable and abusive contracts; he records that the socioeconomic situation has sometimes worsened under these programs. One of the most spectacular gap in the related literature is an almost complete absence of interconnection between REDD and the abundant development literature. One reason may be the divide among technical domains; as most of the REDD literature being concerned with forestry, finance and technical issues, it hardly connects with development's. It appears for some authors as if REDD would emerge in a virgin world where everything is to be (re)invented, whereas many of the issues REDD implementation is faced with are in fact well-known development aid problems and trade-offs. Building on the lessons learned in development over the

last 50 years would most probably avoid much disappointment and waste of resource.

Equity. Closely linked to the issue of poverty alleviation are concerns related to equity and whether REDD will instigate capture and control by the elite, to the detriment of those with less power and resources, as has been the case with other conservation schemes (Balint & Mashinya 2006; Fritzen 2007; Kellert et al. 2000; Thompson & Homewood 2002). Sommerville et al. (2009) hypothesize that REDD will benefit the elite more than the non-elite and that the failure to consider fairness and distribution issues can undermine PES or other conservation projects. Cotula & Mayers (2009) observe that as the value of the standing forest increases, powerful actors look to gain power over these carbon based assets, often to the detriment of the less powerful, arguing that elite capture and misappropriation of the funds are potential byproducts of REDD funding. Opportunity and transactions costs have also been linked to inequity and the perception of fairness of distribution (Adhikari 2005; Kumar 2002). Bond et al. (2009) question the possibility that local peoples can participate as equals in selling carbon, emphasizing the potential for divergence in equity of payment levels and other terms due to negotiating capacity.

Conclusion

The literature suggests the existence of two major gaps in the way REDD is being studied. The first and most salient gap lies in the absence of sustained analysis on the social impact of implementing REDD over the long term. This gap stems from the fact that most of the empirical studies conducted so far focus on how to make REDD work for reducing deforestation and channeling funds to developing countries and not on the problems that such mechanisms, even if they were successful from the perspective of the two aforementioned objectives, would pose from a social perspective. Conversely, the literature that does point out the potentially adverse social impact of REDD tends to be rather normative in this regard, condemning REDD as a dangerous and manipulable tool rather than objectively assessing its positive and negative contributions, and proposing means to adjust it. If REDD is to become a socially acceptable large-scale mechanism for fighting climate change, managing forests and transferring resources, not only the lessons learned form earlier experiences (forest governance mechanisms, carbon sinks, payments for ecosystem services) must be turned to good account, but the economic, political and legal impacts of experimental REDD projects must be assessed empirically, using the full range of social sciences methods.

Whereas forest conservation mechanisms have often required important legal reforms, most notably with respect to land apportionment and distribution, there is little material on how such reforms affect the human rights of both indigenous peoples (with non-formal entitlements to their traditional land) and other sectors of the population (with a right to the enjoyment of property, or social rights, including access to unemployment benefits in case of relocation or professional re-orientation from forest-based activities to other sectors). Earlier experiences would suggest that if REDD were to fulfill the expectations of both developing (regarding

funding) and developed countries (regarding cheaper emission reductions), such results would come at the price of considerable social costs. The extent to which such costs may be worth bearing in the light of the potential benefits to be received from the implementation of REDD is a matter of empirical assessment, an assessment that has yet to be conducted.

The second gap concerns the link between the operation of REDD schemes and governance structures. The lion's share of the literature focuses on those mechanisms that would be effective in making REDD work from the perspective of emissions reduction and financing. Some authors also mention the difficulties arising from implementing a complex system in countries and/or regions with a substantial governance deficit, but such difficulties are seldom, if ever, studied empirically. Most often, the experience of other forest-related mechanisms is brought to bear in order to shed light on the link between REDD and governance. However, the particular features of such other forest-related mechanisms make such assessments difficult to transpose. Only through an empirical assessment of ongoing REDD projects will it be possible to understand the link between REDD and governance structures.

Based on the unprecedented crisis of climate change and the apparent consensus of the UNFCCC parties on this mechanism, REDD could be the first successful attempt to govern the forests at a global scale and to do so in a socially acceptable way. But with the mechanism as it stands, and not sufficient research to improve it, REDD could also very well constitute a missed opportunity to address these issues and repeat the pitfalls of earlier forest governance mechanisms. It is still time to address these shortcomings and design REDD appropriately.

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