Forest Biodiversity, Climate Change and Governance

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Paper prepared for presentation at the "Biodiversity And World Food Security: Nourishing The Planet And Its People" conference conducted by the Crawford Fund for International Agricultural Research, Parliament House, Canberra, Australia, 30 August – 1 September, 2010

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The main drivers of tropical forest biodiversity loss are land clearing for agriculture, pasture and timber plantation development, followed by logging activities that degrade forests. Deforestation and forest degradation also significantly contribute to climate change, given that they contribute about 12–15% of total greenhouse gas emissions. Climate change in turn negatively affects biodiversity and agricultural activities in tropical countries. Therefore the governance of forest biodiversity needs to be closely connected to the governance of the climate.

The following governance factors need to be addressed to reduce tropical forest biodiversity loss. First, corruption and illegal logging appear to contribute to deforestation and forest degradation. Second, the roles in forest management of the various government levels will need to be clearly spelt out, and the appropriate performance-based financial incentives (and related capacity) for forest conservation be provided to the appropriate government levels. Third, economic incentives need to be present for countries to commit to changes in the policies that drive deforestation and forest degradation. These economic incentives will be most effective when they directly reach the holders of the property and management rights to forests. Property and management rights will need to be adjusted for economic incentives to be effective and equitable, and benefit local and indigenous communities. The paper suggests policies and activities that the Australian government could implement within Australia and through the development assistance program to support a mechanism for Reducing Emissions from Deforestation and Forest Degradation (REDD), to reduce biodiversity loss, reduce carbon emissions, and contribute to local livelihoods.

LUCA TACCONI'S research focuses on the economic, political, and social factors that drive environmental change, resulting in loss of biodiversity and climate change—and their implications for rural livelihoods and poverty. His current research concerns governance, social and economic aspects of deforestation and climate change, payments for environmental services, and research methods for environmental management. Prior to joining ANU, he had been a senior scientist at the Center for International Forestry Research and a Rural Development Adviser with AusAID. His latest book regarding payments for environmental services, livelihoods and deforestation will be published later this year.

Introduction

Deforestation and forest degradation result in loss of biodiversity and contribute about 15% of global anthropogenic emissions of greenhouse gases. Land clearing for agriculture and pastures is the main cause of deforestation, and logging is also a major cause of forest degradation (Geist and Lambin 2002). These activities fundamentally occur because those who degrade and convert forests benefit from them. The benefits may be financial, for example from higher returns generated by oil palm plantations compared to sustainable logging, or simply subsistence benefits, for instance through the conversion of forest to crops for domestic consumption. In the short term, deforestation may contribute to an increase in the production of crops with more land coming under cultivation. However, the long-term effects are likely to be negative. Climate change is expected to reduce crop production in developing countries as a result of decreased rainfall, changes in the seasonal distribution of rainfall and higher temperatures. The loss of biodiversity may also lead to a decrease in the production and diversity of agricultural crops, with possible negative effects on human health as emphasised by the World Health Organization.

There has been so far a failure to develop effective international consensus on actions to reduce the loss of biodiversity. There has been progress, however, on an international agreement to reduce emissions from deforestation and forest degradation (REDD+)[1] in developing countries. The need to implement such a mechanism was recognised in the 2009 Copenhagen Accord on climate change. A REDD mechanism would provide developing countries with financial incentives to reduce deforestation and degradation. These payments are a form of compensation for the revenues from agriculture and plantations that they would have to forego. Given that there is a significant but not complete overlap between carbon stocks and reservoirs of biodiversity, positive developments on the REDD front also need to take into account forest biodiversity and the implications for rural livelihoods.

The land use activities that deforest and degrade the forest may have, in some cases, national benefits that are greater than those that could be generated by conserving forests. However, this is not necessarily the case. In that case, deforestation and forest degradation would not be justified on the basis of the national public good, but they may still occur as a result of corruption and illegal logging. For these reason, this paper also addresses the issue of corruption and illegal logging. Furthermore, it is important to address corruption because it may affect the implementation of REDD+.

Whilst there is a need to address deforestation and forest degradation, community and indigenous advocacy organisations have expressed concern about REDD+, particularly because of the lack of clarity about local entitlements to benefit from REDD+ schemes in countries with poor governance. Griffiths (2007) states that the implementation of REDD+ schemes without due regard to rights, social and livelihood issues could increase the risks of renewed and even increased state and expert control over forests to protect lucrative forest carbon reservoirs, violations of customary land and territorial rights, zoning of forest lands without the informed participation of forest dwellers by the state and or non-government organisations, unequal imposition of the costs of forest protection on indigenous peoples and local communities, unequal and abusive community contracts, land speculation, land grabbing and land conflicts.

It is clear from the above that the implementation of REDD+ would require the implementation of several new policies to ensure that i) reduced deforestation and degradation targets are achieved and that ii) the rural people living in and near forests benefits from REDD+.

To implement REDD+ policies and measures within countries effectively and sustainably, there seems to be a need to link national with sub-national initiatives (Angelsen *et al.* 2008), which would involve the distribution of (or some of) the revenues from REDD+. In this context, the paper considers the issue of decentralised forest management. In relation to the issue of providing benefits to rural people, the paper addresses some issues concerning payments for environmental services.

Corruption and illegal logging

Corruption and illegal logging are widespread in countries that are expected to become eligible for REDD+ schemes. There are, therefore, concerns that unless corruption is controlled, it would be difficult for countries to implement REDD+ in an effective, efficient and equitable manner. Let us first summarise how corruption can result in deforestation and degradation.

The impact of corruption on deforestation may start with the design and implementation of land use plans. Land use plans classify forests for various uses, such as conservation, production and conversion to other uses. The land use allocation process should take account of ecological criteria to identify areas that are significant for conserving biodiversity (i.e. allocation to conservation class) or where soils are not suitable for conversion to other uses (i.e. allocation to production forest). Corruption could lead to deforestation by undermining the land use allocation process and the enforcement of land use plans. Overlaps between production and conservation uses have been documented (e.g. Wells *et al.* 1998), but there is a lack of knowledge as to whether this was due to corrupt behaviour or other causes, for example poor coordination of activities between government officials. If land is put to unsuitable use as a result of corruption, then corruption is a cause of the emissions associated with the change of land use. However, corruption is not a cause of defor-

[1] The remainder of the paper continues to use the term REDD+ but it focuses only on deforestation and degradation.

estation when it affects the allocation of, for example, agricultural concessions (to one company instead of another) in areas that have been allocated to conversion through due process.

Corruption can result in forest degradation in a number of ways. First, logging operators bribe forestry officials to allow them to harvest timber without a legal permit (Smith *et al.* 2003). This also makes legal logging less competitive. Second, bribes may be paid to officials to allow the transport of illegally logged timber (Southgate *et al*. 2000). Whilst this type of corruption takes place after the degradation of the forest, it contributes to degradation because if loggers could not transport the logs they would not harvest them. Third, logging operators bribe local officials to obtain logging permits that are not recognised by the forestry regulatory framework (Casson and Obidzinski 2002) or that are really for other purposes (REM 2006). Fourth, logging concessionaires pay bribes so that over-harvesting on their concessions, or harvesting outside the boundaries of their concessions, is not monitored (Barnett 1990; Friends of the Earth 2009). Fifth, bribes contribute to degradation by increasing logging costs, thus leading loggers to over-harvest their concessions to recoup the costs of bribes (Richards *et al*. 2003).

Illegal logging has been estimated to affect some 70 countries (World Wildlife Fund 2002). Most country-level estimates of illegal logging focus on the rate of illegal harvest, and it has been reported that these rates are above 50% of the total harvest in many countries (Contreras-Hermosilla 2002; SGS Trade Assurance Services 2002; World Wildlife Fund 2002; Tacconi *et al*. 2003; Seneca Creek Associates and Wood Resources International 2004). Reported statistics appear to be, however, rather uncertain and show a large degree of variation, partly because different definitions are often used and confusion arises. There may be significant problems with the statistics reported, as demonstrated by the fact that the illegal harvest in Cameroon may not be as significant as previously thought and it takes place in the small-scale logging sector, which was illegally outlawed by the ministry of forestry (Cerutti and Tacconi 2008). All that can be said, therefore, is that the size of the illegal harvest may be significant in many countries but that there are considerable problems with available estimates. Similarly, there is lack of knowledge of the actual contribution of illegal logging to deforestation and forest degradation. There are reports showing that illegal logging contributes to deforestation (e.g. Curran *et al.* 2004), but it can be expected that, due to its nature (i.e. normally involving logging rather than land clearing), illegal logging is more likely to result in forest degradation than in deforestation.

To develop appropriate policies, we need to understand what drives corruption and illegal logging. Multiple causes of these problems have been identified (Tacconi 2007; Tacconi *et al*. 2009), but the most significant driving force of these economic activities is the financial benefit resulting from them.

In relation to corruption, one approach is to describe it as depending on the levels of monopoly, discretion of decision makers and accountability (Klitgaard 1988):

Corruption = Monopoly + Discretion – Accountability.

Another way (complementary to the above) to look at both corruption and illegal logging is that for them to take place, their benefits need to be higher than the costs, such as loss of income (and business for the companies) following conviction. The costs may be less than the benefits if the anticipated benefits from these activities are large (such as significant extra profit for companies and significant extra income for public servants), penalties are low, and or the likelihood of being discovered and convicted are low. Attention needs to be given, therefore, to both the benefits and costs of illegal activities.

On the government side, forestry ministries have traditionally had sole control (i.e. monopoly power) over the allocation of forest resources to a (often) limited number of company logging and plantation companies. The introduction of a REDD+ mechanism is likely to reduce the 'monopoly' power of forestry ministries and their discretion in the allocation of forests.

On the private-sector side, the business opportunities generated by a new commodity (i.e. forest carbon) would attract new companies (as already demonstrated by the voluntary carbon market and the emergence of carbon traders), thus increasing competition in the sector and reducing the power of the traditional logging and plantation companies. Some caveats apply, however. It could be argued that if a ministry of forestry successfully maintained monopoly over the allocation of forests, corruption could still take place and, due

to the presence of more competitors, forestry ministers and officials could ask for larger bribes. Two issues that make the outcome uncertain need to be considered: i) if 'carbon conservation' companies offered bribes to acquire a concession, this would still be an undesirable outcome from a legal and moral viewpoint, but it would lead to forest conservation; ii) 'carbon companies' may be less likely to offer bribes given that they are more likely to be concerned about corporate reputation, thus still leaving the traditional logging and plantation companies in a position to offer bribes and acquire concessions. The increased accountability noted above would still imply, however, that this is less likely than in the without-REDD+ scenario.

In relation to illegal logging, government commitment to reducing it is influenced by the economics of forest management (Tacconi 2007). The economics of sustainable forest management would need to see significant changes for governments to increase their commitment to sustainable management and to promote its implementation throughout the forest estate. REDD+ related payments for reduced degradation could make sustainable timber harvesting competitive with non-sustainable harvesting (Pearce *et al.* 2003), thus providing a further incentive for governments to control illegal logging.

Decentralised forest management

Forest conservation requires local governments to set aside, within their administrative jurisdictions, a considerable amount of land where revenue-generating activities are restricted. These activities are the land uses responsible for deforestation and degradation. Conservation activities involve opportunity costs because forest exploitation and land-use change generate revenue for local governments from local taxes and revenue sharing. Some revenue-generating activities that can be performed in conservation areas, such as ecotourism and non-timber forest product collection, are often less profitable than forest exploitation and other land-use change activities. While forest conservation involves local costs, it generates global benefits, such as biodiversity conservation and carbon sequestration, across jurisdictions. Local decision-makers often neglect the benefits that would accrue to the outsiders and take into account only those benefiting local residents. Financial incentives to support conservation at the local level need to be provided to induce the localities to provide an efficient level of public goods and services.

In order to ensure the successful implementation of REDD+ in decentralised countries, it is important to consider which tasks could be devolved at what level in these countries. The basic principle of subsidiarity in decentralised public administration is that tasks and powers should rest at the lowest-level subunit possible. Local authorities are considered to have better specific information related to local resources, which results in better-targeted policies and lower transaction costs. Several benefits of having local governments involved in the implementation of REDD+ can therefore be summarised as follows: (i) to ensure greater participation of sub-national groups in the decision-making process where the decision making regarding land-use has been devolved; (ii) to increase the efficiency of REDD+ implementation through internalising costs and reducing transaction costs; and (iii) to tackle the specific causes of deforestation at the local level, as the drivers vary from one location to another within a country depending on the economy and the population's needs.

The involvement of the sub-national level in the implementation of REDD+ can vary depending on the extent of authority devolved in forest management. The implementation process can involve a top-down or a bottom-up model. In a top-down model, local governments implement REDD+ based on certain prescriptions provided by the national government. In contrast, local governments have the authority to develop local implementation plans and to implement them under a bottom-up model. Irrespective of the model adopted, the local governments' involvement in the implementation of REDD+ is under the national-based approach, which should be situated within a framework of intergovernmental relationship between the central and sub-national levels.

Because of space constraints, let us consider only the 'ideal' option in which 'the central and local governments decide on a national reference level jointly and the local governments implement REDD+ measures at the local level'. In this option, the central and local governments jointly decide on a national reference level and the local governments implement REDD+ measures based on their own proposals. The implementation process under this option would apply a bottom-

up model, which views policy implementation from the perspective of the targeted population and local governments, as service providers at the local level. The national government would devise a national program at the macro-implementation level such as establishing strict rules and regulations on illegal logging prevention and sustainable forest management. Local governments, at the micro-implementation level, would then develop their own programs to ensure the implementation of the national rules and regulations in their localities. The implementation of REDD+ under this approach would ensure the widest participation and acceptance from local stakeholders. Participation of local stakeholders in the development of REDD+ strategies or policies is possible when the planning process is conducted at the lowest governmental level. Local stakeholders, who would be directly affected by REDD+ policies and measures, are often geographically distant from national authorities. When the planning process is devolved to the local level, local voices and socio-economic conditions are more likely to be taken into consideration in the development and implementation of REDD+.

This approach would require significant resources and time to be allocated to the consultation and planning process. Furthermore, the problem of leakage applies to this option if some local governments choose not to participate following the consultation process. Leakage could lead to an insignificant reduction in emissions in the country as a whole. As a result, the local governments that implemented measures to reduce land use change would not receive payments, unless the national government took on the burden of providing the payments even in the absence of international payments, which is unlikely. In order to address this issue, a robust enforcement and monitoring system would be required to avoid national leakage. This would involve setting reference levels for participating and non-participating local government areas. The non-participating local governments would not be allowed to exceed their reference levels and could be punished with fines if they exceed those levels. It is obvious that to avoid leakage, even the local government areas that would not commit to reductions would still have to be accounted for in the scheme. The national government would also need to nurture the understanding and capacity of local governments in order for the implementation of REDD+ to be successful. There is, however, lack of precise information related to time and resources required to complete bottom-up land use planning processes. A high-quality plan requires professional technical planners with specified skills and experience. The development of the capacity of local governments to prepare high-quality land-use plans may be necessary in some cases, although in some decentralised countries, such as Indonesia, local governments already carry out land use planning functions. A share of the revenues from REDD+ would need to be provided to local governments to compensate them for the opportunity costs noted above.

Payments for environmental services

Payment for environmental service (PES) schemes provide the custodians of environmental services such as clean water, biodiversity and carbon sequestration with financial or other rewards for their role in providing these services. Community and indigenous advocacy organisations and academics have cautioned that the implementation of REDD+ without due regard to rights, social and livelihood issues could have negative effects on local communities. Distributive mechanisms to share REDD+ income at the local scale are therefore considered integral to the equity and effectiveness of REDD+.

The likely significance of PES as a distributive mechanism for REDD+ calls for a clear understanding of the livelihood impacts of existing PES schemes, so that critical lessons can inform the development of REDD+ mechanisms. Several of these lessons have been detailed elsewhere (Tacconi *et al.* 2010). Here it is relevant to consider the issue of land tenure.

A necessary condition for PES is said to be the identification of 'land stewards with reasonably good control over clearly delimited lands' (Wunder 2009, p. 211). However, in many countries, the state owns the largest share of forest land, the primary focus for REDD+. Tacconi *et al.* (2010) show that PES schemes can proceed outside of land under private ownership, on common property and on state lands.

Where there are conflicting claims over ownership and use rights over state forests, tenure reform has been advocated as a precondition for effective, equitable and efficient implementation of REDD+ (Sunderlin *et al.* 2009). Such reforms could include changes in the ownership of land or in use and or management rights over forests and their

products. The latter approach of devolving more limited use and management rights reflects the situation with all of Asia's community forests (Mahanty *et al.* 2009). Transferring land rights from the state to communities (that is, to common property ownership) would be a better option from the perspective of rural communities because it enables more choices over the use of forest land. An alternative proposal is the transfer of rights to the use of forests and the carbon they contain (Streck 2009). Although the architects of PES have emphasised the role of private landholdings, the case studies presented by Tacconi *et al.* (2010) demonstrate the viability of PES schemes focused on common property resources. PES schemes that involve communities instead of individual landholders in implementation have the further benefit of reducing transaction costs, while building on local community institutions—and if necessary supporting new ones—to strengthen social capital.

What can Australia do to support the implementation of REDD?

Supporting tropical forest conservation through development assistance

With the allocation of $273 million to the International Forest Carbon Initiative (IFCI), Australia was one of the first countries, in 2007, to devote significant support to the development of a REDD mechanism. This is an important initiative, but a more encompassing view of policy options is needed to improve tropical forest management in a way that leads to reduced emissions as well as biodiversity conservation and benefits for rural people.

To be more effective, IFCI should implement demonstration activities at a provincial level rather than at only a project level. Demonstration activities are aimed at showing how REDD can be implemented in practice. Many tropical forest countries, including Indonesia which is the main recipient of funding from IFCI, have a degree of decentralised management of forests. Appropriate systems to involve lower levels of government in forest conservation need to be designed and tested. These programs have to address the governance factors that influence forest management.

Corruption and illegal logging are widespread in tropical forest countries. There are, therefore, concerns that unless corruption is controlled, it would be difficult for countries to implement REDD in an effective, efficient and equitable manner. The impact of corruption on deforestation may start with the design and implementation of land use plans. Land use plans classify forests for various uses, such as conservation, production and conversion to other uses. The land use allocation process should take account of ecological criteria to identify areas that are significant for conserving biodiversity or where soils are not suitable for conversion to other uses. Illegal logging has been estimated to affect some 70 countries. Reported statistics, however, appear to be rather uncertain and show large variation, partly because different definitions are often used and confusion arises. Similarly, there is a lack of knowledge of the actual contribution of illegal logging to deforestation and forest degradation, but it can be expected that, due to its nature, illegal logging is more likely to result in forest degradation than in deforestation.

Capacity-building programs should therefore support improved regulatory frameworks aimed at reducing corruption and illegal logging, and support the strengthening of law enforcement capacity.

Strengthening activities should also build national-level institutional capacity to map carbon stocks and deforestation, coupled with the design of protected areas for biodiversity conservation and the allocation of agricultural lands. Unless biodiversity conservation and agricultural production are explicitly considered, carbon conservation activities could have less than desirable effects. These assessments should also consider politically acceptable outcomes: protected areas would ideally be evenly distributed across local government areas, to avoid burdening too much any one area.

Community and indigenous advocacy organisations and academics have cautioned that the implementation of REDD without due regard to social and livelihood issues could have negative effects on local communities like those of some existing protected areas. To provide benefits to local stakeholders, governments of tropical forest countries could use a mechanism of 'Payments for Environmental Services' (PES) to share funding obtained through REDD activities. PES schemes provide the custodians of environmental services such as clean water, biodiversity and carbon sequestration with financial or other rewards for

their role in providing these services. Governments could therefore use PES to provide incentives for reducing emissions on private or community lands, according to the amount of carbon conserved by those stakeholders. Recent research conducted at the Australian National University shows that PES can have positive livelihoods impacts, but certain design and property rights issues need to be addressed. Programs to strengthen the capacity of governments to implement PES should therefore be supported.

Policy initiatives in Australia

To support forest conservation in neighbouring countries such as Indonesia and Papua New Guinea in an effective and efficient way, policy initiatives should also be adopted within Australia.

The Rudd government had assessed the options to reduce the import of timber derived from illegally harvested logs. However, it did not reach the point of implementing any of the measures. The new government should consider the introduction of a domestic regulatory framework on illegal timber products. This would complement the support provided through the aid program to reduce greenhouse gas emissions and to conserve biodiversity.

Finally, funding is needed for the actual implementation of REDD after the initial capacity-building phase. Various assessments, including the Stern Review of Climate Change, have noted that to substantially reduce deforestation developed countries will need to allocate significant financial resources for developing nations: estimates range between $10 and $40 billions per year. This large amount of resources is unlikely to be available from government coffers, especially in the current environment of high public debts. Markets will have to be tapped. We come therefore to one of the most politically sensitive issues, the pricing of greenhouse gas emissions.

While designing a carbon pricing mechanism, the new government should consider the development of regional or bilateral carbon markets with tropical forest countries. Allowing a regulated, limited share of emissions from forestry in the region to offset emissions in Australia would contribute to lower carbon prices in Australia. Limiting the amount of forestry credits allowed as offset would ensure the price of carbon is sufficiently high to bring about a reduction in emissions by Australian polluters. This proposal could be implemented regardless of whether Australia adopts an emission trading scheme (ETS) or a carbon tax. Forestry carbon certificates could be exchanged directly in the ETS market. In the case of a carbon tax, a fund could be set up to hold some of the revenues from the tax and purchase forestry carbon credits.

Setting a price on carbon would provide an increased incentive to governments in the tropics to address illegal logging. And the lower the carbon price, the larger the size of emission cuts that could be achieved at the same cost in Australia. This would provide a significant contribution to our efforts to address climate change and to reduce the loss of biodiversity.

Acknowledgements

This paper draws on research conducted through the following projects: Australian Development Research Awards (EFCC083) ‘Assessing the livelihood impacts of incentive payments for avoided deforestation’; Australian Research Council (LP 0989909) and Australian Development Research Awards (EFCC 082) ‘Governance and economic incentives for reducing the contribution of tropical deforestation to climate change’; and Australian Centre for International Agricultural Research (FST/2007/052) ‘Improving governance, policy and institutional arrangements to reduce emissions from deforestation and degradation (REDD)’.

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