

Forest and Climate Change Policy: What are the **costs of inaction**?

Dr. Tim Forsyth London School of Economics and Political Science



Abstract

Deforestation and forest degradation are some of the main contributors to anthropogenic climate change. Accordingly, policies to arrest deforestation or increase forest areas are proposed as important forms of climate change policy. This paper summarizes current proposals for addressing the contribution of forests to climate change, and the political problems of implementing these policies, especially in developing countries. The paper argues that current estimates of the likely sequestration benefits and costs of forest policies need to be tempered according to the political barriers and need for local consultation in formulating and implementing these proposals. These problems are likely to be most felt concerning current plans for Reduced Emissions from Deforestation and forest Degradation (REDD).

Introduction

According to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), one third of anthropogenic greenhouse gas emissions during the last 250 years have resulted from changes in land use, and especially deforestation. Sir Nicholas Stern's report on climate change suggested avoiding this deforestation was a 'highly cost-effective option' to mitigate climate change (Stern, 2007: 537). Today, various schemes have been proposed to integrate forests into global climate change policy, which seek to protect existing forests, or plant new trees.

This paper summarizes the challenges and proposals to mitigate anthropogenic climate change, and with special reference to Southeast Asia. The paper argues that many projections of costs have been made about deforestation and forest policies concerning climate change. But these costs are difficult to assess without understanding the difficulties of implementing forest policies in diverse political settings in Asia, or without acknowledging the political opposition to some of these policy proposals.

The paper starts by considering the information about the impacts of deforestation on anthropogenic climate change. It then proceeds to analyse the different proposals for integrating forests into global climate change policy, and especially recent debates about Reduced Emissions from Deforestation and forest Degradation (REDD). The paper concludes by arguing that the estimated costs of deforestation and forest policies are of little benefit without also considering the costs and difficulties of formulating and implementing effective policies.

Deforestation and anthropogenic climate change

According to recent statistics, Southeast Asia contributed 12 percent of global greenhouse gas emissions in the year 2000 (WRI, 2008). Some 75 percent of these emissions came from land use change and forestry. Climate change policy in Southeast Asia is therefore clearly connected to forest policy at an unusually high level.

Deforestation contributes to climate change in three important ways. First, the removal of trees often includes the burning or decomposition of vegetal matter. These processes release carbon dioxide, but also the additional and more powerful greenhouse gases of nitrous oxide and methane. Second, removing, or changing land cover usually reduces the absorption (or sequestration) of carbon dioxide from the atmosphere, and can change the reflection of heat into the atmosphere (or albedo). And thirdly, many new land uses might release further emissions, such as cattle ranching or enhanced fertilizer use, which also release methane and nitrous oxide.

According to the IPCC (2007), global emissions from deforestation in the 1990s alone were estimated to be 5.8 Gigatons of carbon dioxide equivalent per year (Gt/CO₂-eq/yr). Related to this change in land use and land cover, the IPCC (2007) also estimated that some 35-40 percent of global methane emissions arise from livestock-related emissions, and more than 60 percent of nitrous oxide emissions to fertilizer use (see Nabuurs et al, 2007).

These themes are particularly important in Southeast Asia. Indonesia is a country with large levels of forest, and alone accounted for 59 percent of the region's total greenhouse gas emissions in 2000 (WRI, 2008). The second highest emitter, in terms of proportion, was Thailand with just six percent. Indonesia also has the highest levels of deforestation in the region, of some 1.9 thousand hectares a year – although this is still some way behind the world's leading deforester of Brazil with 3.1 thousand hectares (FAO, 2005). Myanmar has Southeast Asia's second highest rate of deforestation with nearly five hundred thousand hectares. The Philippines and Papua New Guinea also feature highly. A key contributor to greenhouse gas emissions from forests is uncontrolled fires, such as occurring during drier (El Niño) years. According to one estimate, burning of rainforests and peatlands in Indonesia, Malaysia, and Papua New Guinea released an average of 128 million tons of carbon (or 470 million tons of carbon dioxide) per year between 2000 and 2006. Borneo and Sumatra were largest sources (van der Werf et al 2008).

























Not surprisingly, much debate about mitigating climate change has focused on how these emissions related to deforestation can be controlled or reduced. Some of the most common suggestions are:

- **Avoided Deforestation** – or policies to reduce levels of deforestation, such as by slowing down agricultural expansion or illegal logging.
- **Afforestation and Reforestation** – afforestation is planting trees in new locations, reforestation is replacing lost trees. When conducted well, planting trees can also increase the fixing of carbon in soil through the growth of roots and the accumulation of organic matter.
- **Extend the carbon retention of harvested wood products** – this allows wood products to be used for longer before they deteriorate. For example, it might mean protecting wood products used in housing or construction, or reducing the disposal of wood through burning.
- **Product Substitution** – finding alternatives to wood to supply certain products or services such as fuelwood.
- **Producing biomass for bio-energy** – for example, some tree crops such as oil palm can replace fossil fuels or even reduce demand for fuelwood. Indeed, the IPCC (2007) has estimated that biomass from forestry can contribute roughly 0.4-4.4 GtCO₂/yr depending on whether biomass replaces coal or gas in power plants.

Related to these, the IPCC (2007) also estimated the potential contribution of these actions towards mitigating climate change. These estimates are based on assuming a carbon price of 100 US\$/tCO₂-eq. Furthermore, there is a range of estimates according to whether mitigation is estimated using global climate models or ground surveys and additional data. Using the more conservative ground survey data, forest policies could mitigate between 1.3 and 4.2 GtCO₂-eq/yr (or an average 2.7) in 2030. Using the more ambitious global models, this number rises to 13.8 GtCO₂-eq/yr in 2030.

The IPCC also estimates that about half of these actions could be achieved at a cost of under 20 US\$/tCO₂ (or, approximately 1,550 MtCO₂/yr). But, clearly, the costs and attractiveness of different options vary according to location and activities. One important debate is whether it is more attractive to implement forest policies in developed or developing countries. Developing countries are often considered more attractive for forest policies because much deforestation is occurring in these countries now. Furthermore, labour, land and inputs can be cheaper than in developed countries. Trees often grow faster in tropical climates. Accordingly, the IPCC (2007) has estimated that the costs of carbon sequestration forestry projects can vary between 0.5 US\$ to 7 US\$/tCO₂ in developing countries, and between 1.4 US\$ to 22 US\$/tCO₂ in developed countries (Cacho et al., 2003; Richards and Stokes, 2004). But all of these figures are openly acknowledged to be estimates and hence likely to contain errors (see Nabuurs et al, 2007).

Figure 1 shows the IPCC (2007) summaries for the likely impacts, costs, and timing of costs associated with each of the proposed mitigation activities involving forest policies. This diagram shows, for example, that increasing the forest area might have upfront costs but long-term benefits. In macro terms, the Stern Review (2007) estimated that halving global deforestation would cost around US\$5 billion per year.

	Mitigation Activities	Type of Impact	Timing of Impact	Timing of Cost
1A	Increased forest area <i>(eg. new forests)</i>			
1B	Maintain forest area <i>(eg. prevent deforestation, LUC)</i>			
2A	Increase site-level C density <i>(eg. intensive management, fertilize)</i>			
2B	Maintain site-level C density <i>(eg. avoid degradation)</i>			
3A	Increase landscape-scale C stocks <i>(eg. SFM, agriculture etc)</i>			
3B	Maintain landscape scale C stocks <i>(eg. suppress disturbances)</i>			
4A	Increase off-site C in products <i>(but must also meet 1B, 2B and 3B)</i>			
4B	Increase bioenergy and substitution <i>(but must also meet 1B, 2B and 3B)</i>			

Legend







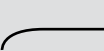

Type of Impact	Timing *change in Carbon over time	Timing of cost *dollars (\$) over time
Enhance sink 	Enhance sink 	Enhance sink 
Reduce source 	Reduce source 	Reduce source 
	Sustained or repeatable 	On-going 

Figure 1: Estimates of the timing of costs and impacts for forest-based climate change mitigation policies (IPCC, 2007) (note: C = carbon)

Political opposition

Implementing these forest policies globally, however, has encountered controversy. One of the earliest controversies lies over the extent to which controlling deforestation in developing countries is an ethical or appropriate request to make to countries that are undergoing industrialization. In 1990, the US-based think tank, the World Resources Institute (WRI) published a report concerning national responsibility for anthropogenic climate change that was based on an index that gave particular attention to rates of deforestation (WRI, 1990; later published as Hamilton et al 1991). Perhaps unsurprisingly, this report listed China, India and Brazil among the top six emitting countries.

This report started one of the most famous disputes in global environmental politics. In response, the Indian NGO, the Centre for Science and Environment (CSE), published a critical report called *Global Warming in an Unequal World* (Agarwal and Narain, 1991). In this report, the CSE pointed out that the WRI index was based on total national emissions, rather than on per capita emissions. At the time of the report, the USA had per capita emissions of approximately six tons per person, while India and China had less than 0.5 tons. Secondly, the index used highly simplistic estimates for both deforestation and methane emissions. For example, estimates of wet-rice methane emissions were extrapolated globally from Italian figures; deforestation was treated uniformly, with no distinction made between export-led logging and smallholder food production; and no account was taken of the impacts of vegetation that might replace forest. Thirdly, the index focused chiefly on current tropical deforestation, and did not consider historic deforestation in developed countries (which is important as greenhouse gases can exist for many years).

Together, these arguments implied that the standardized statistical analysis applied by WRI did not take into account important questions of social justice in greenhouse gas emissions, concerning whether deforestation in developing countries was because of poverty and food production. Moreover, they also

implied that developed countries should not ask developing countries to protect forests when richer countries had already conducted deforestation, and when many current greenhouse gas emissions might be linked to affluence rather than just livelihoods.

These themes have influenced debates about the role of forests within climate change policy since. At the First Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) at Berlin, in 1995, it was agreed in principle to investigate the possibility for achieving future national greenhouse gas emission reduction targets through investing in projects in other countries. This tentative agreement led to the establishment of so-called Activities Implemented Jointly (AIJ) as a pilot phase for international cooperation on reducing greenhouse gas concentrations, and which saw a number of carbon-offset forestry projects established in a number of countries by large emitters such as Japan and the USA. Such projects were also supported by additional organizations such as the United States Initiative on Joint Implementation, and by the World Bank Prototype Carbon Fund (operational from 2000).

The arguments for forest-based climate change policies were clear. Forests offered important contributions to greenhouse gas concentrations, and protecting, or increasing forest areas, could reduce these concentrations. Moreover, statistics from the IPCC (mentioned above) suggested that so-called 'sinks,' or land-use, based investments in developing countries could be significantly cheaper than projects in richer countries, or projects involving industrial technology and energy efficiency. Many developing countries, however criticised forests-based projects because they saw these investments as ways of clever accounting to allow richer countries to avoid responsibility for reducing emissions at home. Moreover, some developing countries preferred to see investment go towards industrial technology transfer, and feared that forests projects might not assist with industrialization, and might even reduce livelihood opportunities for poorer farmers. Critics also claimed that forest projects that could generate

good sequestration and local development benefits would always be more costly than those predicted by the IPCC.

As a result of these concerns, the 1997 Kyoto Protocol produced a compromise under the Clean Development Mechanism (CDM). The CDM was one of the three so-called flexible mechanisms of the Kyoto Protocol, which also included Joint Implementation (allowing climate-friendly investment within Annex I countries), and Emissions Trading (between the national targets of Annex I countries). (Annex I countries are the richer countries that had specific greenhouse gas-reduction targets allocated to them at Kyoto).

The CDM was different to other flexible mechanisms because it specifically referred to investment in climate-friendly activities from Annex I countries in non-Annex I countries (usually developing countries). Furthermore, the CDM was intended to offer a 'development dividend' that helped create local sustainable development in host countries as well as cheap climate change mitigation (see Grubb et al, 1999).

But the demand for forests-based climate investment was still strong. For many environmentalists, reforestation has been represented as somewhat of a 'magic bullet' to address a range of environmental problems comprising climate change; declining biodiversity; controlling erosion and water shortages; and the aesthetics of lost wilderness.

For example, the British explorer and popular writer, Robin Hanbury-Tenison, wrote, somewhat romantically:

Carbon sinks... these are exactly the elements of the Kyoto protocol that offer our last hope of saving the rain forests.

(Hanbury-Tenison, 2001)

And Lester Brown, a founder member of the Worldwatch Institute wrote:

Restoring forests... means reversing decades of tree cutting and land clearing with forest restoration, an activity that will require millions of people planting billions of trees. ...A small area devoted to plantations may be essential to protecting forests at the global level.... At present tree plantations cover some 113 million hectares. An expansion of these by at least half, along with a continuing rise in productivity, is likely to be needed both to satisfy future demand and to eliminate one of the pressures that are shrinking forests. This, too, presents a huge opportunity for investment.

(Lester Brown, 2001:82, 85, 95)

But against these kinds of statements, critics argued that simply planting trees as a response to increasing greenhouse gas concentrations was partly a strategy to reduce pressure for reducing industrial emissions at source. Indeed, one reporter noted that an official at the US Department of Energy allegedly claimed in 1994 that 'tree planting will allow US energy policy to go on with business as usual out to 2015' (in Lohmann, 1999:2). There was also worry that emphasizing plantation forestry would restrict local livelihoods and development options within poorer countries. One angry African negotiator told a meeting in London in 1997, 'Our countries are not toilets for your emissions!' (Forsyth, 1999:255). Similarly, other critics, such as the Uruguay-based NGO, the World Rainforest Movement, have claimed that carbon offset forestry is equivalent to 'CO2lonialism.'

Furthermore, many observers have pointed out, rightly, that carbon-offset forestry is difficult to measure on account of establishing clear baselines for measuring the additionality of projects, or whether forest conservation in location might cause 'leakage', or displacing deforestation elsewhere (Cullet and Kameri-Mbote, 1998). Such concerns, in turn, have influenced how forests have been defined by the UNFCCC. Between 1997 and 2000, some 130 definitions of 'forest' were mentioned in debates among states alone, before a universal definition of forest was defined by the Conference of the Parties to the UNFCCC at The Hague in November 2000:

'Forest' is an area of land of 0.3–1.0 hectares (ha) with tree crown cover (or equivalent stocking level) of more than 10–30 percent with trees with the potential to reach a minimum height of 2–5 meters (m) at maturity in situ. A forest may consist either of closed forest formation where trees of various storeys and undergrowth cover a high proportion of the ground; or open forest formations over an area of 0.3–1.0 ha with a continuous vegetation cover in which tree crown cover exceeds 10–20 percent. Young natural stands and all plantations which have yet to reach a crown density of 10–30 percent or tree height of 2–5 m are included under forest (UNFCCC/ SBSTA/ 2000/ CRP.11; pp.7, November 2000) (UNFCCC, 2000).

This definition is useful because it clarifies which kinds of forest are permissible for accreditation under the UNFCCC. But it also excludes certain forms of land cover such as savanna that have been called forests by biologists, or the various social and livelihood services offered by forest ecosystems. This definition of 'forest' is also related to the debate concerning official certification of forests through other means, such as by the Forest Stewardship Council, which has provided official certification to several monoculture plantations, to the concern of NGOs such as the World Rainforest Movement.

Indeed, in 2000, a number of NGO activists, including representatives from Greenpeace and the Rainforest Action Network, signed the 'Mount Tamalpais Declaration' (after the site in California) to oppose the use of the CDM for supporting plantations, and to urge greater consultation of local users of forests in decisions about climate change policy.

Reduced Emissions from Deforestation and forest Degradation (REDD)

REDD is the proposal to incorporate forests into climate change policy by rewarding actors for slowing down deforestation, or taking further action to increase forest areas. It is a market-based mechanism that allows actors to demonstrate climate-friendly activities concerning forests, and then to sell these achievements on the international carbon market. Furthermore, REDD is also a political mechanism that can allow developing countries with large areas of forest to participate in, and benefit from, the UN Climate Change Convention. In effect it offers incentives such as payments to countries, and sub-state actors to protect forests.

For the sake of clarity, it is worth defining some terms. The basic term of REDD refers to the ability to slow down deforestation by taking demonstrable action to reduce emissions resulting from deforestation and the degradation of forest areas. Over time, however, two further terms have emerged. REDD+ refers to the reduction of deforestation in addition to acts of afforestation and reforestation. And REDD+ with co-benefits refers to all of these activities plus the establishment of additional socio-economic benefits such as livelihood options for people living in forest areas, or the enhancement of local biodiversity. As discussed above, the historic debates about the role of forests in climate change policy has influenced these terms. Many negotiators would like to see REDD+ as a policy focusing mainly on mitigation of climate change. REDD+ with co-benefits, however, is more attractive to negotiators who wish to see a more holistic form of climate change policy that can provide a 'development dividend', and which avoids social impacts of controlling land use change.

The objectives of REDD (or its associated terms) are, again, very clear. Changes to forest and land use are important contributors to rising greenhouse gas concentrations. To date, efforts to reduce deforestation have been hampered because deforestation is caused by many diverse factors, such as commercial logging; illegal logging; and agricultural expansion by state-led activities in countries such as Indonesia and Brazil, or by large-scale settlement and food production by poorer populations in developing countries. International treaties to address deforestation have also been difficult because many developing countries with forests have rejected the idea that they should not use their forest resources when so many developed countries have already done so. Moreover, in some countries states have little domestic capacity to control local governments or farming communities who wish to extend agricultural production into forest areas.

The question of 'avoided deforestation' has also been discussed at UNFCCC meetings for some years, but with controversy. Many scientific observers rightly

pointed to the contribution of land-use change and deforestation to global anthropogenic climate change. But some developing countries such as Brazil, and NGOs such as Greenpeace argued that avoided deforestation was a spurious concept because it focused on emissions that were not yet occurring, and that international discussions should focus on reducing industrial greenhouse gas emissions at source. Moreover, as with most activities involving forests and climate change, it can be very difficult to demonstrate additional and measurable changes to carbon sequestration, or overall declines in deforestation – although in principle, these measurements are technically feasible.

Since 2000, however, there have been important steps towards incorporating the principles of REDD into global climate change policies. One important step here was the ninth UNFCCC Conference of the Parties in Milan in 2003, which was known as the 'forests conference' because it involved much discussion on establishing rules and methodologies for evaluating afforestation and reforestation. This was followed by the creation of the Coalition of Rainforest Nations (CfRN) in 2005, after a speech by Sir Michael Somare, Prime Minister of Papua New Guinea at Columbia University. (The economist, Jeffrey Sachs, who works at Columbia was an important encourager of this initiative). The aim of the Coalition was to bring together developing countries with large areas of forest in order to make a unified voice calling for economic incentives for forest conservation. At the thirteenth UNFCCC Conference of the Parties at Bali in 2007, some agreement on forests (incorporating REDD) was mentioned as part of the so-called Bali Roadmap, which was a list of important themes to be clarified before the agreement of the post-Kyoto climate agreement.

One of the important dilemmas of REDD is to incorporate countries with different levels of forest cover. Figure 2 demonstrates a common representation of the so-called Forest Transition. This concept is based on the idea that countries will initially have a large area of forest cover, which

will decline as population and economic or agricultural development increases. Rewarding countries for avoiding deforestation, or increasing forest areas, might therefore require providing different mechanisms for both sides of the Forest Transition. Countries with existing forest stocks might require funds to help protect forests and build monitoring systems to ensure this is happening. Countries that have already lost forest areas might need different funds to increase forests. Figure 2 shows this proposed transition for the case of Vietnam (Meyfroidt and Lambin, 2009) – although it is worth noting this model is controversial for reasons stated below.

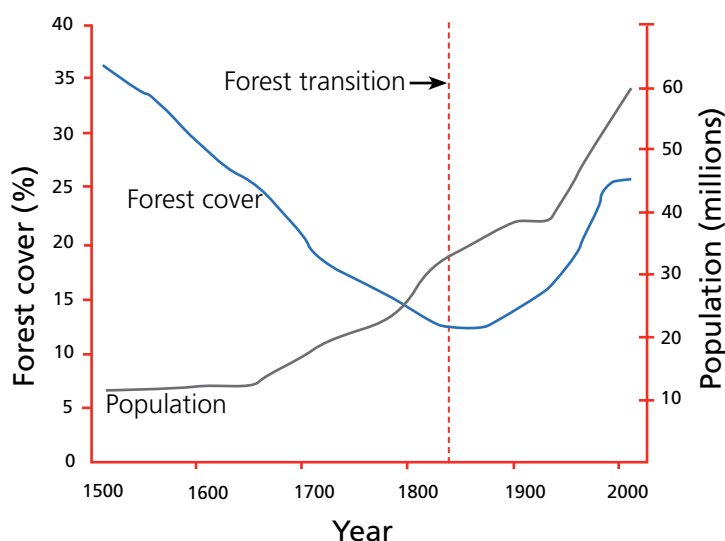


Figure 2: *The Forest Transition (as reported in Meyfroidt and Lambin, 2009)*

The UNFCCC negotiations have accordingly proposed a variety of levels to the REDD mechanism (UNFCCC, 2006). Proposals are for three key funds:

- The basic REDD Mechanism: providing credits for countries that have produced demonstrable reductions in emissions resulting from deforestation or forest degradation. These credits can then be sold in international carbon markets.
- A REDD Stabilisation Fund: to encourage countries that have already stabilised deforestation to continue (and hence avoid perverse incentives for these countries to increase deforestation in order to be rewarded under REDD for then reducing them).
- And a REDD Enabling Fund: to provide upfront finance to build capacity for countries without accounting or monitoring infrastructure. These funds could be paid to countries such as Myanmar or the Democratic Republic of Congo, which have relatively larger areas of existing forest, but little official capacity to monitor rates of deforestation or illegal logging.

Furthermore, new funding for REDD-related activities have emerged from the World Bank's BioCarbon Fund (2004), and Forest Carbon Partnership Fund (2007). The Global Environment Facility has provided a new Tropical Forest Account, and the UN has its new REDD Programme. Various other regionally specific funds have also emerged such as the Congo Basin Forest Fund; the Norwegian Forest and Climate Initiative; and the Asia-Pacific based International Forest Carbon Initiative. Private-sector investment might also be attracted

and forthcoming. In one estimate, the Stern Review (2007) proposed that halving global deforestation would cost around \$5 billion per year.

But, predictably, there are also many important question marks and criticisms of current proposals for REDD. We have already mentioned the ongoing problems of measuring reduced deforestation, additionality and leakage. But in addition, some critics have argued that REDD (or REDD+) in its current proposed form does not take into account the needs and rights of local forest users, or the implications of REDD+ for large-scale industrial plantations. According to one representative of the NGO, the Forest People's Programme,

'there is a growing realisation that REDD policies as currently proposed contain serious moral hazards because they plan to reward polluters with a history of forest destruction, but would fail to recognise and reward the role of indigenous and local forest custodians who protect and sustainably use standing forests' (Griffiths, 2008: 2).

Some research on existing payment for environmental services schemes have also suggested that poorer, forest-dependent people might not always benefit. For example, Granda (2005) assessed a Dutch-sponsored monoculture tree plantation in Ecuador, and concluded there were immense costs and problems in implementing a meaningful level of participation within the scheme. The research claimed communities were never informed by the carbon forestry company about payments they would receive per hectare; local people did not know the purpose of carbon credits; they did not know about penalty clauses, and consequently were now in debt in order to pay such penalties. Villagers also felt aggrieved they had to pay all unforeseen costs of forest plantations, such as failed seedlings or fire damage.

A further report by Greenpeace (2007) in the Democratic Republic of Congo argued that the World Bank's strategies there increased, rather than avoided deforestation, by using logging as a form of economic development – and that logging titles have frequently been allocated without acknowledging local land rights. Indeed, the report claimed payments of just salt and beer have been made to community leaders in return for logging rights. In another study of the World Bank in Guyana, Griffiths (2008: 11) argued, 'the national REDD concept submitted to the [Forest Carbon Partnership Fund]... contains misleading and inaccurate information on land tenure, governance and deforestation,' and that in Peru, the Bank's technical advisors explicitly refused to acknowledge forest peoples as key rights holders in REDD.

These kinds of problems have given rise to a new term in forest management of carbon tenure. Carbon tenure is the rights of individuals or the state to hold, or profit from the ability to use forests for purposes of climate change mitigation. In Papua New Guinea in 2008, local farmers were surprised to learn that the national government claimed all carbon rights relating to forests in this country. On one hand, this decision gives the state more incentives to agree to, and implement REDD-based policies. On the other hand, some critics see this as restricting the rights of local landholders. (Marshall, 2008) Furthermore, some critics such as the World Rainforest Movement have claimed that the movement towards REDD+ (including afforestation and reforestation rather than avoided deforestation alone) will legitimise the movement towards large-scale plantations, rather

than the protection of old-growth forest. Indeed, large-scale industrial plantations can frequently sequester more carbon than old-growth, or more biodiverse forests because the newer forests grow more quickly. Consequently, the model of the Forest Transition (see Figure 2) is useful for showing forest land cover alone: it says nothing about forest quality, or the proportion of forest land covered by plantations.

In response to these dilemmas, development-oriented NGOs have called for a more inclusive and longer-term approach to planning REDD or REDD+ in developing countries. For example, one approach known as Free and Prior Informed Consent (FPIC) has been urged by various analysts (Forest People Programme, 2007; Global Witness, 2008; Wilson, 2009). Indeed, Griffiths (2005, 2008) has argued that the World Bank approach to forest-related climate investment has used the term 'consultation' to imply a higher level of participation than actually achieved, and that FPIC should be the driving principle for REDD projects.

The arguments for implementing a more inclusive form of REDD are to ensure that local people do not have livelihoods restricted by heavy-handed regulations or new plantations. Moreover, extra consultation will probably lead to more successful of REDD policies if local people are in favour of them and understand the objectives. The argument against more consultation is that it takes more time raise costs. But there are some emerging examples of successful implementation of REDD, or models that can involve more consultation. Wilson (2009: 31) outlines the activities by one investor (Veracel) for ensuring social participation in Brazil. These activities include a social networks program (to engage communities with collaborations); a social inventory (to map communities); social articulation and mobilisation (to allow business employees to work with communities); and dialogues with local governments and neighbouring landowners. Veracel's main work is in eucalyptus plantations, but it also engages in environmental restoration in degraded land.

Conclusion: What are the costs?

Forest policies are fundamentally important for any international regime to address anthropogenic climate change. There is no doubt that addressing problems of deforestation and forest degradation will impact beneficially on global attempts to mitigate climate change. It will also bring benefits to protecting biodiversity, and – if done in a consultative way – will also help address poverty and development by maintaining and protecting local livelihoods in poorer countries.

But the discussions about formulating and implementing forests-based climate change policies are so far dominated by discussions of their costs and benefits that do not take into account the political realities of what these policies actually mean, or need, in order to be implemented successfully.

For example, this paper started by repeating Sir Nicholas Stern's initial statement that avoided deforestation was a 'highly cost-effective option' (Stern, 2007: 537). Moreover, the IPCC Fourth Assessment Report (2007) has stated that forest-based projects are likely to be significantly cheaper in developing countries than in richer countries.

But Stern later added: 'clarity over boundaries and ownership, and the allocation of property rights regarded as just by local communities, will enhance the effectiveness of property rights in practice and strengthen the institutions required to support and enforce them' (Stern, 2007: 541). Yet, these actions are necessary in order to make forest-based climate change policies work. Moreover, paying attention to these matters will also probably mean that political opposition to REDD or other forest-based policies will not undermine the suggestion in the first place. Neither Stern nor the IPCC (2007) pay any attention to how these considerations will affect initial estimates of costs or cost effectiveness. In particular, many estimates within the IPCC (2007) Fourth Assessment Report are based on an assumption that carbon prices might reach US\$100 per ton. In late 2009, the European Trading System priced one ton at close to €14. Much more public acceptance of the need for carbon trading, and a resulting rise in carbon prices need to occur before we can accept these estimates based on higher carbon prices.

REDD (and its associated forms), of course, is still in its early days. Cautionary examples should not be taken as proof that REDD will fail. But it would be foolish to assume that difficult tensions between different stakeholders can be ignored. If REDD is to succeed – and especially where there are local forest users – there is a need for a multi-actor, multi-level form of governance that can anticipate different capacities, objectives, and values of various stakeholders. Some analysts might consider that these processes are too time consuming or costly. The obvious response to these concerns are that implementing policy without acknowledging different values and objectives between stakeholders will only result in failure, and in an additional loss of trust in the UNFCCC and climate change policy process. The climate change negotiations need more attention to these political processes rather than just considering simple estimates of the likely impacts of policies on greenhouse gases, or the relative costs without considering these politics. ■

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