

REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION IN DEVELOPING COUNTRIES (REDD): IMPLEMENTATION ISSUES

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This article was finalised prior to the Copenhagen Conference of the Parties ('COP15') under the United Nations Framework Convention on Climate Change ('UNFCCC'), held in December 2009. At the COP15, parties failed to agree on a new, binding international pact to supplement or replace the UNFCCC for the period after 2012 (when current targets set under the Kyoto Protocol expire). Reducing emissions from deforestation and forest degradation in developing countries ('REDD') was one of the few issues to achieve significant, widespread support at COP15. The non-binding 'Copenhagen Accord', agreed by a group of parties at COP15, and noted by the Conference of Parties ('COP'), recognised 'the crucial role' of REDD and agreed on the need to provide 'positive incentives' for REDD through 'the immediate establishment of a mechanism ... to enable the mobilization of financial resources from developed countries'.¹ Given this international endorsement of REDD at COP15, the implementation issues discussed in this article are all the more pertinent.

I INTRODUCTION

Globally, forests cover some 30 per cent of the Earth's land surface, amounting to nearly 4 billion hectares.² Forests provide a range of valuable ecosystem services, as well as supplying timber and other products for human uses. In addition, '[t]hey contain the greatest assemblages of species found in any terrestrial ecosystem'³ making them critical to the conservation of global biodiversity. In the climate change context, the role of forests is also crucial. The world's forests represent a significant carbon stock, housing 240 441 million tonnes of carbon in their biomass.⁴ Forests take up carbon in the regrowth phase and an expansion of forest area in some parts of the world means that forests remove a considerable

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1 'Decision 2/CP.15' in UNFCCC, *Report of the Conference of the Parties on its Fifteenth Session, held in Copenhagen from 7 to 19 December — Decisions Adopted by the Conference of the Parties*, UN Doc FCCC/CP/2009/11/Add.1 (2009) 6[7].

2 Food and Agricultural Organization of the United Nations ('FAO'), *State of the World's Forests 2009* (2009) 115. Based on 2005 figures.

3 Emily Matthews et al, *Pilot Analysis of Global Ecosystems: Forest Ecosystems* (2000) 45.

4 FAO, above n 2, 122. Based on 2005 figures.

proportion of anthropogenic carbon dioxide emissions from the atmosphere.⁵ However, processes such as deforestation and forest degradation release carbon into the atmosphere as carbon dioxide ('CO₂'), contributing to global warming and climate change.

Emissions resulting from deforestation and forest degradation are thought to make up a substantial portion of global greenhouse gas ('GHG') pollution. In his influential analysis of the economics of climate change, Sir Nicholas Stern reported that emissions resulting from land-use change, such as the conversion of forests to pasture land, accounted for 18 per cent of worldwide GHG emissions in 2000.⁶ Other estimates suggest levels of around 20 per cent of annual GHG emissions in the 1990s.⁷ This makes deforestation and forest degradation the second largest source of global GHG emissions after the energy generation sector.⁸ In developing countries, 'CO₂ from [land-use change and forestry] constitutes an estimated one-third of total emissions', with tropical countries such as Indonesia and Brazil being amongst the world's largest sources of deforestation-related GHG emissions.⁹ Consequently, bodies such as the Inter-governmental Panel on Climate Change ('IPCC') have proposed activities to reduce deforestation and forest degradation as a climate mitigation option, offering perhaps the greatest short-term potential (in terms of reduction in emissions per unit of funds expended).¹⁰

Strategies to reduce GHG emissions from deforestation and forest degradation in developing countries ('REDD') were put squarely on the international negotiating agenda at the Conference of the Parties ('COP') for the *United Nations Framework Convention on Climate Change* ('UNFCCC') held in Bali in December 2007. The Bali Action Plan, which launched negotiations for a new climate change agreement for the period post-2012, included a direction for negotiating parties to address '[p]olicy approaches and positive incentives' on REDD issues in developing countries.¹¹ These approaches might take the form of a market-based mechanism that assigns tradeable credits for REDD activities, or a funding-based mechanism that awards funds to developing countries based upon their success in reducing

5 Michael Raupach et al, 'Global and Regional Drivers of Accelerating CO₂ Emissions' (2007) 104 *Proceedings of the National Academy of Sciences of the United States of America* 10288.

6 Sir Nicholas Stern, *The Economics of Climate Change: The Stern Review* (2007) 604.

7 United Nations Framework Convention on Climate Change, *Fact Sheet: Reducing Emissions From Deforestation in Developing Countries: Approaches To Stimulate Action* (2009) <http://unfccc.int/files/press/backgrounders/application/pdf/fact_sheet_reducing_emissions_from_deforestation.pdf> at 10 April 2010. The Intergovernmental Panel on Climate Change put CO₂ emissions from forestry at 17.3 per cent of global anthropogenic greenhouse gas emissions in 2004 in its fourth assessment report. See Intergovernmental Panel on Climate Change, *Climate Change 2007 Synthesis Report: Summary for Policy-Makers* (2007) 5.

8 Stern, above n 6, 196.

9 Kevin Baumert, Timothy Herzog and Jonathan Pershing, 'Navigating the Numbers: Greenhouse Gas Data and International Climate Policy' (World Resources Institute, 2005) 91.

10 Gert Jaan Nabuurs et al, 'Forestry' in Bert Metz et al (eds), *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel* (2007) 543.

11 UNFCCC, *Report of the Conference of the Parties on its Thirteenth Session, Held in Bali from 3 to 15 December 2007*, UN Doc FCCC/CP/2007/6/Add.1 (2008) 3.

forest loss or degradation.¹² Both types of options were actively canvassed at the Fifteenth Conference of the Parties ('COP 15') in Copenhagen, December 2009.

While the regulatory form that any global REDD mechanism might take remains unsettled, widespread (albeit not universal) support for pursuing REDD at the international level has led many to anticipate its eventual acceptance as an element of international climate change law.¹³ Indeed, even if REDD does not emerge as part of the post-Copenhagen international climate change legal framework it is likely to continue to be of importance for voluntary offset markets.¹⁴ The focus of the discussion of REDD in the literature and international practice thus tends to be on what mode of implementation will, or should, be used to give effect to the concept. Left to one side are the technicalities (and associated uncertainties) of implementation, which are implicitly assumed to be resolvable once REDD mechanisms are put in place at the international level. However, we argue that when it comes to on-the-ground implementation of REDD it will be these 'technicalities' of a scientific and legal nature that will ultimately determine the effectiveness of REDD and its capacity to deliver both global emissions reductions and local community benefits.

In this article we aim to highlight some of the major technical questions and uncertainties that face the implementation of REDD, from scientific and legal perspectives. Part II of the article provides a backdrop to this discussion by briefly canvassing the emergence of REDD as a potential climate change mitigation option under the UNFCCC. The subsequent parts of the article then take up different aspects of the implementation of REDD, highlighting issues and uncertainties associated with the definition of forests, estimation of forest loss and establishment of criteria for sustainable forest management; ensuring accurate monitoring and verification of REDD activities; and putting in place tenure arrangements at the local level that will allow for appropriate monitoring and assessment of REDD performance over time. While at one level these aspects of the implementation of REDD are technical in nature, the extent to which they are addressed will impinge very directly at the local level in terms of determining whether REDD is able to deliver its often-touted 'co-benefits' to local and indigenous communities in developing countries.¹⁵

12 See also Ad Hoc Working Group on Long-term Cooperative Action Under the Convention, *Non-paper No.39-Contact Group on Enhanced Action on Mitigation and its Associated Means of Implementation* (2009) UNFCCC <http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/awglca1biiinp39051109.pdf> at 19 April 2010.

13 For a critical assessment of the prospects of REDD under the international climate change regime see also Ian Fry, 'Reducing Emissions from Deforestation and Forest Degradation: Opportunities and Pitfalls in Developing a New Legal Regime' (2008) 17(2) *Review of European Community and International Environmental Law* 166; Rosemary Lyster, 'The New Frontier of Climate Law: Reducing Emissions from Deforestation (and Degradation)' (2009) 26 *Environmental and Planning Law Journal* 417.

14 Lisa Moore, 'Voluntary Carbon Offsets: a Legal Perspective' in Wayne Gumley and Trevor Daya-Winterbottom (eds), *Climate Change Law: Comparative, Contractual & Regulatory Considerations* (2008) 159. In fact, as noted the Copenhagen Accord from COP15 suggests strong agreement on the need for REDD as part of the climate change regime.

15 See, eg, UNFCCC, *Report of the Conference of the Parties on its Thirteenth Session, Held in Bali from 3 to 15 December 2007*, UN Doc FCCC/CP/2007/6/Add.1 (2008) 8, which states that '[r]educing emissions from deforestation and forest degradation in developing countries can promote co-benefits and may complement the aims and objectives of other relevant international conventions and agreements'.

II REDD: THE INTERNATIONAL CONTEXT

The idea for a global agreement on REDD first emerged in 2005 in the submissions of Papua New Guinea and Costa Rica to the UNFCCC's eleventh COP as a way for developing countries to engage with the emissions reduction requirements of the *Kyoto Protocol*.¹⁶ These two countries put forward two options for addressing deforestation within the international climate change framework. The first involved the development of a free standing REDD protocol to the UNFCCC. The second proposed relying upon the adoption of a series of decisions under the *Kyoto Protocol* to extend the Protocol's scope to cover emissions from deforestation. Since 2005, REDD has been under continuous discussion within the international climate change regime, with a broad range of countries submitting their views on the topic to the UNFCCC.¹⁷

Although the submission made by Papua New Guinea and Costa Rica was the first occasion raising the question of 'RED' (as it was then known — forest degradation not yet having been included within the concept),¹⁸ the more general issue of deforestation and land-use change has a longer history within the international climate change regime. In negotiations for the *Kyoto Protocol*, which sets emissions reduction targets for developed countries,¹⁹ Australia argued successfully for the inclusion of reduced emissions from deforestation for countries taking on legally-binding commitments (Annex I parties).²⁰ Similar arguments were made by a range of countries for 'avoidance of deforestation' to be included as an eligible activity under the Protocol's Clean Development Mechanism ('CDM'), which is designed to encourage developing countries' participation by generating tradeable credits from certain emissions reduction activities undertaken by developed countries in the territories of developing country parties.²¹ However,

16 UNFCCC, *Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action — Submission by the Governments of Papua New Guinea and Costa Rica*, UN Doc FCCC/CP/2005/MISC.1 (2005).

17 For a discussion of the course of REDD negotiations, see Catherine Potvin and Andrew Bovarnick, 'Reducing Emissions from Deforestation and Forest Degradation in Developing Countries: Key Actors, Negotiations and Actions' (2008) 3 *Carbon and Climate Law Review* 264.

18 Ibid 267. Potvin and Bovarnick attribute the later inclusion of forest degradation within REDD to the activism of African developing countries in the Congo River Watershed. For these countries, threats to their forests come primarily from forest degradation i.e. 'decrease of carbon stock per unit area not resulting in the reduction/disappearance of forest cover'. See UNFCCC Subsidiary Body for Scientific and Technological Advice, *Further Steps under the Convention Related to Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action, Submission of the Views of Congo Basin Countries*, UN Doc FCCC/SBSTA/2007/misc.14 (2007) 25.

19 *Kyoto Protocol to the Framework Convention on Climate Change*, opened for signature 16 March 1998, 2303 UNTS 148, art 3 (entered into force 16 February 2005).

20 Ibid art 3(7). This provides for the inclusion of emissions from deforestation in Annex I parties 1990 baselines. As Australia was the only developed country with significant deforestation, this provision became known as the 'Australia clause'. Indeed, reduced emissions from this cause have been the major factor in Australia being likely to meet its Kyoto commitments.

21 This issue proved to be very divisive, leading to splits within the Group of 77 ('G77'). For example, Brazil, Peru and China were all opposed to the inclusion of avoided deforestation under the CDM. For further discussion, see Ian Fry, 'Twists and Turns in the Jungle: Exploring the Evolution of Land Use, Land-Use Change and Forestry Decisions within the Kyoto Protocol' (2002) 11(2) *Review of European Community and International Environmental Law* 159, 166–7.

this latter proposal was rejected as a result of methodological concerns, as well as fears that it might allow countries to obtain carbon credits for simply maintaining carbon stocks rather than taking proactive actions to reduce emissions from land-use change. Consequently, only afforestation and reforestation in developing countries are recognised as eligible activities under the CDM.²² In any event, forestry-related projects have proven difficult to implement in the CDM context, with only a few such projects receiving certification over the course of operation of the mechanism.²³

Consolidation of REDD as a key issue in negotiations for a new international climate change agreement (to replace or supplement the *Kyoto Protocol* that is set to expire at the end of 2012) came with the 2007 Bali COP. At this meeting, a group of developing countries known as the 'Rainforest Coalition' played a central role in securing text relating to REDD in the Bali Action Plan. Amongst developed countries, proposals regarding REDD also received strong support from the European Union ('EU') and Australia.²⁴ It seems that the EU perceives REDD as a cost-effective means for EU countries to meet the region's ambitious domestic emissions reduction targets.²⁵ The EU pushed for the inclusion of language in the Bali Action Plan regarding a set of modalities to guide REDD demonstration projects.²⁶ It was hoped that these pilot projects would aid in resolving technical and methodological issues pertaining to REDD.

As part of more recent negotiations, countries have argued for an additional component to be included in any REDD mechanism (known as REDD+).²⁷ This would permit nations to increase regeneration and restoration of native forest and increase carbon sequestration.²⁸ Somewhat more controversial are proposals

22 'Afforestation' is defined as 'the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources'. 'Reforestation' is defined as 'the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land... that did not contain forest on 31 December 1989.' See UNFCCC, *Report of the Conference of the Parties on its Seventh Session, Held at Marrakesh from 29 October to 10 November 2001*, UN Doc FCCC/CP/2001/13/Add.1 (2002) 58.

23 See *CDM/JI Pipeline Analysis and Database* UNEP RISØ CENTRE <<http://www.cdmpipeline.org>> at 17 December 2009; Jenny Henman, Stephen Hamburg and Angel Salazar Vega, 'Feasibility and Barriers to Entry for Small-Scale CDM Forest Carbon Projects: A Case Study from the Northeastern Peruvian Amazon' (2008) 3 *Carbon and Climate Law Review* 254.

24 In respect of the latter, see, eg, Australian Government, *Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) — Submission to the AWG-LCA, AWG-KP and SBSTA* (2008).

25 Potvin and Bovarnick, above n 17, 265.

26 UNFCCC, *Report of the Conference of the Parties on its Thirteenth Session, Held in Bali from 3 to 15 December 2007*, UN Doc FCCC/CP/2007/6/Add.1 (2008).

27 Ad-Hoc Working Group on Long-Term Cooperative Action, *Ideas and Proposals on the Elements Contained in Paragraph 1 of the Bali Action Plan: Submission from Parties: Addendum*, UN Doc FCCC/AWG/LCA/2009/MISC.1/Add.4 (2009) 3. The concept of REDD+ was adopted in the Copenhagen Accord at COP15.

28 For example projects in Costa Rica described by G. Arturo Sanchez-Azofeifa, 'Costa Rica's Payment for Environmental Services Program: Intention, Implementation, and Impact' (2007) 21(5) *Conservation Biology* 1156.

for funding for the expansion of tree plantations; an important option for some developing countries such as China.

On the ground in developing countries, REDD might be achieved by slowing deforestation. Deforestation involves the conversion of forest to other forms of land cover, such as crops or grazing land, and represents the largest source of carbon emissions to the atmosphere from tropical forests.²⁹ Alternatively REDD activities might look to reduce the extent or impact of selective harvesting,³⁰ although regrowth and recovery following harvesting are an important accounting consideration if this option is pursued. Forest fires can release a similar amount of carbon to the atmosphere as deforestation during dry years,³¹ and so reducing the extent or impact of fire in forests may also reduce greenhouse emissions. However, the interactions between fire and vegetation are complex and simply excluding fire for long periods may be no guarantee that carbon stocks will be maintained in the long-term.

While the notion of REDD has advanced significantly from early proposals and has seemingly acquired an unstoppable momentum in international negotiations and practice, the details of technical means of implementation and appropriate regulatory frameworks to support the reduction of deforestation and forest degradation activities in developing countries remain largely unresolved. These technical questions will need to be addressed to ensure that reductions in forestry-related emissions credited to REDD activities are real and verifiable, as well as to avoid potential problems such as a lack of permanence and additionality in emissions reductions, and leakage (ie, the displacement of emissions from deforestation and forest degradation from one part of a country to another). Further, if the rhetoric of REDD co-benefits is to have any purchase, regulatory frameworks for REDD activities will need to pay close attention to the internal nation-state structures that will be required to effect compliance in a manner which does not override the intricacies and sustainability of local community and customary management of forest areas.³²

III IMPLEMENTATION ISSUES FROM A SCIENTIFIC PERSPECTIVE

Despite questions over the technical feasibility of REDD projects, as well as the legal manner in which REDD might be included in the international climate change regime — and indeed whether it should be included at all — vigorous discussion has proceeded around the best model for implementing REDD. The

29 Richard Houghton, 'Data Note: Emissions (and Sinks) of Carbon from Land-Use Change' (Woods Hole Research Centre, 2003) 2.

30 Francis Putz et al, 'Improved Tropical Forest Management for Carbon Retention' (2008) 6 *Public Library of Science — Biology* 1368.

31 See, eg, Ane Alencar, Daniel Nepstad and Mariadel Carmen Vera Diaz, 'Forest Understory Fire in the Brazilian Amazon in ENSO and Non-ENSO Years: Area Burned and Committed Carbon Emissions' (2006) 10(6) *Earth Interactions* 1.

32 See generally, Peter Ørebech et al, *The Role of Customary Law in Sustainable Development* (2005).

various options for implementing REDD fall into two broad categories.³³ In the first category are market-based approaches that focus on generating carbon credits from REDD activities to be sold in an international carbon trading market. A market-based mechanism would most likely employ an emissions baseline or target — whether determined on a national or sub-national, project basis³⁴ — with reductions below the baseline being converted into tradeable carbon credits. Sale of these credits by developing countries would generate revenue, which could be used to support REDD actions. Linkage with an international carbon market would create a ready avenue for the sale of REDD credits. However, if such credits are measured and verified utilising inaccurate methodologies, or if systems to reduce deforestation and forest degradation in developing countries are poorly enforced, there is a danger that REDD credits of questionable effectiveness could flood the carbon market, undermining incentives for developed countries to implement more expensive technologies to reduce emissions.

In the second category of potential implementation models for REDD are funding-based mechanisms.³⁵ Proposals in this category attempt to provide an intermediary arrangement between the providers of REDD credits and the international carbon market. This involves setting up a fund from which financial incentives could be distributed to developing countries that demonstrate a credible reduction in emissions from deforestation or forest degradation. A number of suggestions have been put forward as to sources for the new fund, including the imposition of a levy on joint implementation and emissions trading activities under the *Kyoto Protocol*. Regardless of where the fund is sourced from, there will need to be appropriate criteria and mechanisms in place to determine developing countries' eligibility to receive monies for undertaking REDD activities.

In the past there have been many international efforts to combat deforestation which have also sought to achieve climate change and biodiversity objectives, including a range of 'Debt-For-Nature Swaps' programmes that commenced in the 1980s. While having some success, many of these programmes failed to take into account factors such as global commodity demands and to effectively engage local forest communities. A lack of clear programme objectives and a paucity of evaluation, made it difficult to assess the impact of these early conservation efforts.³⁶ The particular impetus for 'Debt-For-Nature Swaps' was the spiralling debt crisis experienced by many developing countries, in concert with a growing awareness of the need to stem the escalating clearance of the world's tropical rainforests.³⁷ The 'Debt-For-Nature' schemes comprised a number of public

33 There are also proposals that combine both approaches in a so-called 'basket' mechanism

34 The Rainforest Coalition, together with developed countries such as the EU and Japan, has argued in favour of a national baseline approach as a means to control leakage. Sub-national baselines have been advocated by a number of South American countries on the basis that national baseline setting may not be feasible for some developing countries. See Potvin and Bovarnick, above n 17, 266.

35 Ibid 267. Brazil has been a strong proponent of funding-based mechanisms for REDD.

36 Lydia Olander et al, 'International Forest Carbon and the Climate Change Challenge: Issues and Options' (Nicholas Institute for Environmental Policy Solutions, Duke University, 2009) 46–8.

37 Michael Sher, 'Can Lawyers Save the Rainforest? Enforcing the Second Generation of Debt-For-Nature Swaps' (1993) 17 *Harvard Environmental Law Review* 151, 155–6.

government to government schemes, as well as some privately funded ‘swaps’ where a portion of a developing country’s debt was reduced in return for certain commitments by the governments of developing countries to protect high value forest biodiversity areas. For example, Conservation International purchased an amount of Bolivia’s public debt in 1987 in exchange for Bolivia agreeing to protect 3.7 million hectares of tropical forest.³⁸ The Bolivian government failed to effectively realise this protection in legally enforceable measures, however schemes in other countries met with more success combining legal and technical modes of implementation.³⁹ The enforcement of such schemes against a set of indicators to determine if environmental goals had been achieved emerged as critical. More recent initiatives in this vein include: the Global Environment Facility (a partnership with the United Nations Development Program (‘UNDP’) over the last two decades supporting biodiversity and forest conservation) and the World Bank Forest Carbon Partnership Facility.⁴⁰

Similarly, a significant issue facing any approach that foresees the incorporation of REDD under the international climate change regime or as part of voluntary offset markets is the technical means by which performance of developing countries will be measured, verified and enforced. If an answer to this question does not emerge, both market-based and funding-based alternatives for the implementation of REDD are likely to encounter insurmountable difficulties. Accordingly, in the next sections of the article we turn to consider several scientific and technical issues raised by REDD activities that will impact the scope for their effective implementation.

A Quantifying Carbon Emissions

Quantifying carbon emissions associated with deforestation and degradation is a critical ingredient of effective REDD mechanisms. Nevertheless, establishing the longer-term extent of human impact on forests has proved challenging. Many studies have started from the notion that a global ‘pre-human’ forest condition existed and could be established in a scientific way and then human impacts could be superimposed to assess the extent of human influence or ‘degradation’ from this situation. The reality of the situation is far more complex, with human activities resulting in loss, modification, promotion and replacement of forest and trees at different times during human history and in different geographical locations.⁴¹ More broadly, there has been critique of the ‘wilderness’ idea that posits that there exists a pristine pre-human forest scenario, as this was a salient factor in the

38 Ibid 159–60.

39 For example in Madagascar with the setting up and continuing financing of the Madagascar Foundation, see Steven Freeland and Ross Buckley, ‘Debt-for-Development Exchanges: Using External Debt to Mitigate Environmental Damage in Developing Countries’ (2010) 16 *Hastings North & Northwest Journal of Environmental Law and Policy* 80, 94.

40 The Global Environment Facility and the World Bank have financed or co-financed a multitude of projects, see World Bank, *Projects and Operations* <<http://www.worldbank.org/projects>> at 17 December 2009.

41 See Michael Williams, ‘A New Look at Global Forest Histories of Land Clearing’ (2008) 33 *Annual Review of Environment and Resources* 345.

dispossession of many local forest dwelling peoples.⁴² Accordingly, the integration of human and ‘natural’ factors at play in shaping the characteristics of forests and other areas of high biodiversity conservation value has been recognised at international law in a range of treaties, such as the ‘cultural landscape’ concept within the *World Heritage Convention*.⁴³

Forests have also proved remarkably resilient in many places and can re-establish rapidly when human population or other pressures are relaxed. Between 1850 and 1992 the total area of forest regrowth is estimated to have been about 235 million hectares.⁴⁴ However, as objective measures of assessing forest cover through satellite imagery have only been in place for the last 30 years, an analysis and interpretation of this record is incomplete.

1 Defining ‘Forest’

In seeking to assess the success of programs to reduce deforestation and forest degradation, a necessary prior task is to produce data on existing levels of forest area and current rates of forest loss. These values then act as a baseline in calculating the effectiveness of different REDD measures. However, shifting terminology complicates the evidential basis for determining forest cover, and therefore, the baselines against which performance is assessed.

One of the challenges in assessing the area of forest is first to define the term. The word ‘forest’ itself originally had little to do with trees. Its etymological origins lie in Latin for the word outside (as in *forestis silva* — land that is ‘beyond the main or central area of administration; outside the common law’).⁴⁵ This term was used by the Normans to describe land that belonged to the Crown. Royal forest estates in Europe were used primarily for hunting game meat. Trees provided the best cover and habitat for game and therefore forested areas were managed and forest habitat deliberately cultivated to provide for these resources.

Today, numerous definitions of ‘forest’ are in use. Definitions vary widely from country to country and between agencies within countries.⁴⁶ The United Nations Food and Agriculture Organisation (‘FAO’) has sought to establish an international consensus on this definitional question since it first began to collect information from member countries for the purpose of its periodic Global Forest Resource Assessments in 1947.⁴⁷ The FAO’s most recent assessment, which occurred in 2005, used the following definition:

42 See, eg, Paige West, James Igoe and Dan Brockington, ‘Parks and Peoples: The Social Impact of Protected Areas’ (2006) 35 *Annual Review of Anthropology* 251.

43 Sarah Titchen, ‘Changing Perceptions and Recognition of the Environment — from Cultural and Natural Heritage to Cultural Landscapes’, in Julie Finlayson and Ann Jackson-Nanko (eds), *Heritage and Native Title: Anthropological and Legal Perspectives* (1996) 40.

44 Navin Ramankutty and Jonathan A Foley, ‘Estimating Historical Changes in Global Land Cover: Croplands from 1700 to 1992’ (1999) 13 *Global Biogeochemical Cycles* 997.

45 Michael Quinion, *No Trees in the Forest: Chasing a Changing Sense* (1996) World Wide Words <<http://www.worldwidewords.org/articles/forest.htm>> at 20 December 2009.

46 H Gyde Lund, ‘When is a Forest Not a Forest?’ (2002) 100(8) *Journal of Forestry* 21.

47 Peter Holmgren and Reidar Persson, ‘Evolution and Prospects of Global Forest Assessments’ (2002) 53(3) *Unasylva* 3.

Land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.⁴⁸

This definition provides for a high degree of inclusion: countries with only small, fragmented areas of tree cover with low stocking or crown cover can still report some area of forest. However, the definition is regarded by many as too permissive, particularly in terms of the minimum crown cover, which is generally below the minimum threshold designated by ecologists where trees constitute the dominant life form.⁴⁹ In addition, it is a difficult threshold to detect using satellite-based, remotely-sensed data. Consequently, Australia and many developing countries do not use the 10 per cent threshold in their respective national definitions of 'forest'.⁵⁰

2 Estimating Forest Loss

Using the FAO definition, total global forest area as of 2005 was estimated at 3.95 billion hectares or 30 per cent of global land area.⁵¹ 'Other wooded land' (which generally means land with trees that does not meet the minimum definitional thresholds) was 1.38 billion hectares. This gave a total forest and wooded land area similar to previous estimates of the total area of denser forest.⁵² One-quarter of the total global forest area is found in Europe (including, for FAO reporting purposes, Russia). South America has 21 per cent of the total area and North and Central America 18 per cent. However, forests are not evenly distributed across countries. The Russian Federation alone accounts for 20 per cent of the total global forest area and five countries (the Russian Federation, Brazil, Canada, the United States and China) account for more than half of total forest area (2097 million hectares). By contrast there are 64 'low forest cover' countries with less than 10 per cent of their total land area covered by forests.

For the FAO's 2005 assessment, countries provided information on their forest area for three points in time. The net change calculated through this process was therefore the sum of losses due to deforestation or natural disasters and increases in forest area due to afforestation and natural expansion of forests. Employing this method, the total net loss in forest area over the 10 years from 1990–2000 was estimated at 8.9 million hectares per year. In the period between 2000 and 2005 this rate of net loss reduced somewhat to 7.3 million hectares per year. The FAO does not disaggregate its estimates into absolute values of loss and gain in each country. An estimate of total loss was generated by summing the loss for countries with a negative change in forest area. This resulted in an estimated

48 FAO, 'Global Forest Resources Assessment Update 2005; Terms and Definitions (Final version)' (Working Paper No 83, Food and Agriculture Organization of the United Nations, 2004).

49 Williams, above n 41, 353.

50 Montreal Process Implementation Group for Australia, 'Australia's State of the Forest Report 2008' (Bureau of Rural Sciences, Canberra, 2008).

51 This equates to 0.62 ha per person: FAO, *State of the World's Forests 2009*, above n 2.

52 Williams, above n 41, 354.

gross loss of forest of 13.1 million hectares per year between 1990 and 2000 and 12.9 million hectares per year between 2000 and 2005.

It is worth emphasising that these are conservative estimates, since the net change reported by countries includes afforestation and natural forest expansion. The actual rate of deforestation will therefore be higher than these figures, as it does not include the forest area lost in those countries that reported a net increase in forest cover or the areas that are balanced by regrowth in those that reported a decrease. The extent to which this is actually reported varies between countries. For example, Brazil used an estimate of the area of forest based on remotely-sensed data for the year 2000 and added annual clearing estimates for the 1990s to produce a figure for forest cover for 1990 and subtracted annual clearing estimates to produce a figure for 2005. No estimate of naturally regenerated secondary forests was included and the net loss of forests in Brazil is likely to be an overestimate.

While the data presented in the latest FAO assessment is collectively regarded as the best available global figures, it still has significant shortcomings. Much of the data — particularly that from Africa — is incomplete or based on outdated historical surveys. In some cases, partial studies have been undertaken within countries and extrapolated to the national area. Information was often not available for the time series of dates used in the FAO Assessment and extrapolation of historical data was used to estimate the value for 2005. The general validity of estimates of global deforestation, particularly in the tropics, is thus open to question.⁵³ As a result, many have argued for increased investment in monitoring through satellites and ground-based measurements to improve capacity for the assessment of carbon stocks associated with land cover change. Australia is one country that has invested heavily in such systems to underpin reporting for this activity.⁵⁴ Even so, this has not eliminated controversy about the methods of calculating Australia's contributions to greenhouse gas emission reductions from the forestry sector as evidenced by recent controversies about whether Australia should claim exemptions for natural disasters, such as bushfires, which can add significantly to emissions.⁵⁵

B Criteria and Indicators of Sustainable Forest Management

On the other side of the ledger from methodologies for determining forest cover and deforestation rates are measures for assessing the sustainability of management practices that may increase forestation over time. Protection of forests for climate mitigation benefits will require an agreement on appropriate criteria for assessing the success of forest management. These agreements will

53 Ibid 354. See also Philip M Fearnside and William F Laurance, 'Tropical Deforestation and Greenhouse-gas Emissions' (2004) 14 *Ecological Applications* 982; Alan Grainger, 'Difficulties in Tracking the Long-term Global Trend in Tropical Forest Area' (2008) 105 *Proceedings of the National Academy of Sciences* 818.

54 Australian Government, *National Greenhouse Gas Inventory 2007* (2009) Department of Climate Change, Canberra.

55 Peter Ker, 'Bushfires "Must Be in" Carbon Tally', *The Age* (Melbourne), 15 December 2009, 4.

need to be between those nations intending to reduce their rate of forest loss or increase forest cover and commercial entities, other countries or an intermediary fund. Such agreements can take many forms, including debt-for-nature swaps, conservation covenants or direct purchase of freehold property rights by international conservation organisations.⁵⁶

An existing example of an intergovernmental agreement designed to achieve forest conservation objectives that relies on scientific criteria and indicators of sustainable forest management is the system of Regional Forest Agreements ('RFA') in Australia.⁵⁷ This model of forest management, and its history of establishment in Australia, is discussed below as an illustration of both the strengths and limitations of the strengths and limitations in designing implementation systems to evaluate the performance of forest management activities.

1 Australian Forest Management and the RFA System

Forest use in Australia became a matter of considerable public debate through the 1970s and 1980s. This debate was associated with the then constitutional disputes between the federal and State governments over the extent of Commonwealth power with respect to environmental matters.⁵⁸ Under the Australian Constitution, while States have general responsibility for matters of land-use and natural resource management, the Commonwealth can override these responsibilities through the enactment of laws based on its constitutional powers relating to corporations, trade and commerce (for example, to require the issue of export and import licences subject to Commonwealth environmental standards) and external affairs (in order to implement treaties and other international agreements).⁵⁹ During the 1980s, the Commonwealth successfully implemented protection regimes for various forests in Tasmania, New South Wales and the wet tropics of North Queensland pursuant to its obligations as a party to the World Heritage Convention.⁶⁰ These interventions by the federal government into what had previously been regarded as States' domain of forest and natural resource management attracted significant controversy, culminating in a series of High

56 See below Part V for a discussion of different tenure models for implementing REDD.

57 There are Regional Forest Agreements in the following regions: Western Australia, West Victoria, North East Victoria, Central Highlands Victoria, Gippsland Victoria, East Gippsland Victoria, Tasmania, Southern New South Wales, Eden New South Wales, North East New South Wales, for a link to the agreements: see Australian Government, Department of Agriculture, Fisheries and Forestry, *Regional Forest Agreements Home* <<http://www.daff.gov.au/rfa>> at 13 April 2010.

58 Drew Hutton and Libby Connors, *A History of the Australian Environment Movement* (1st ed, 1999) 145–64.

59 Crawford suggests that it now may be more realistic to begin with proposition of 'substantial federal authority with respect to environmental management' rather than that of general State competence since with expansive interpretation of constitutional powers 'one may wonder whether the qualifications do not eat up the rule': James Crawford, 'The Constitution and the Environment' (1991) 13 *Sydney Law Review* 11, 13. Nevertheless, while this reflects the realities of the power structures, in practice the Commonwealth has been content to leave the majority of day-to-day environmental management to the States and Territories.

60 *Convention for the Protection of the World Cultural and Natural Heritage*, opened for signature 16 November 1972, 1037 UNTS 151 (entered into force 17 December 1975).

Court challenges.⁶¹ Subsequently, the federal government sought to reduce continuing federal-state conflict by developing an overarching National Forest Policy Statement ('NFPS'), signed by the Commonwealth and State governments in 1992.⁶²

The NFPS sets out broad conservation and industry goals for forest management. It presents a vision, objectives and policies for the future management of public and private forests. It was a joint response of the Commonwealth, State and Territory Governments to three major reports on forest issues: those of the Ecologically Sustainable Development Working Group on Forest Use, the National Plantations Advisory Committee, and the Resource Assessment Commission's Forest and Timber Inquiry. It also reflected the resolutions of the 1992 Intergovernmental Agreement on the Environment, and in some ways, foresaw the potential implications of treaties concluded during the United Nations Conference on Environment and Development, specifically, the *Convention on Biological Diversity*.⁶³ The NFPS recognises the differing responsibilities and interests of the three levels of government in Australia (i.e. federal, state and local governments) in respect of forest management. It also provides a framework within which pressures for change can be identified and accommodated so as to ensure that the Australian community derives optimal benefit from its forests and forest resources.

Following development of the NFPS, the Australian Government was active in the development of criteria and indicators of sustainable forest management. Australia was a founding member of the Montreal Process established to develop an internationally agreed set of such criteria and indicators.⁶⁴ It later put in place national processes to implement these criteria and indicators at State and forest management unit levels. Subsequently, these criteria and indicators of sustainable forest management have formed the basis for national State of the Forests reporting.⁶⁵

A key element of the NFPS involved negotiating RFAs between the Federal and State governments. These 20-year agreements provide for a comprehensive, adequate and representative system of conservation reserves and, most relevantly for our purposes, the harvesting and use of forests outside the reserve system in compliance with principles of ecologically sustainable forest management ('ESFM').⁶⁶ To date, ten RFAs have been agreed by the Federal government with four State governments: Western Australia, Tasmania, Victoria and New South Wales. In general, RFAs apply only to public State-managed forests, although

61 See, eg, *Commonwealth v Tasmania* (1983) 158 CLR 1, 159 (Mason J) ('*Tasmanian Dam case*').

62 Australian Government, *National Forest Policy Statement: A New Focus for Australia's Forests* (1992). Tasmania was the only State that refused to sign but later signed an amended version of the Statement in 1995.

63 *Convention on Biological Diversity*, opened for signature 5 June 1992, 1760 UNTS 79, (entered into force 29 December 1993).

64 Montreal Process Implementation Group for Australia, above n 50.

65 Ibid; Australian Government, *National Greenhouse Gas Inventory*, above n 54.

66 Stuart M Davey, James RL Hoare and Karl E Rumba, 'Sustainable Forest Management and The Ecosystem approach — An Australian Perspective' (2003) 54 (3–4) *Unasylva* 3.

in the Tasmanian RFA specific provision was also made to achieve forest conservation objectives on private land.

2 Development of RFAs

RFAs were initiated with a scoping agreement between the two parties, identifying respective obligations, objectives and interests and broad forest uses, and specifying arrangements for managing the process including the completion of comprehensive regional assessments. Montreal Process criteria and indicators were used as the basis for reporting and review.⁶⁷ Specific targets were set for conservation reserves, including the preservation of larger proportions for rare or threatened ecosystems and old growth forests, with some flexibility allowed in the achievement of these targets where economic or social impacts were considered unacceptable. The intention was to give resource certainty to industry, ensure that harvesting occurred at sustainable rates and that wildlife habitats, biodiversity, water quality, soils, heritage and other valuable resources were protected.

RFAs were underpinned by Comprehensive Regional Assessments of environmental, cultural, economic and social values in each region and extensive stakeholder consultation. This included extensive mapping of regional ecosystems, old growth forests, disturbance history and cultural values. Options for the use of the forest resources were developed with the participation of local government, industry, unions, regional economic development organisations, conservation groups and other interested parties. Following the development of these options, a further period was allowed for public comment. The environmental, economic and social impacts of these options were then assessed by governments.

The final RFAs provide details of management and use of the forests that aim to ensure that environmental obligations are met and that industry has a prescribed level of access to forest resources. Agreements are for 20 years but there are provisions for review every five years. Industry and structural adjustment funding included under RFAs has helped forest agencies develop new resource supply options, including plantation development. It has also helped forest businesses and workers to adjust to reduced forest resource supply.

National forest policies and associated inter-governmental agreements in Australia have been effective in providing clear statements of shared values and intentions. As such, they provide a template for comprehensive forest assessment, public engagement, and evaluation of the environmental, social and economic impacts of different land management options and structural adjustment arrangements that may be of value in structuring agreements related to REDD. Even so, they have their limitations in meeting the expectations of all stakeholders.⁶⁸ For instance, many regard RFAs more as political solutions than as effective processes for public

67 Montreal Process Implementation Group for Australia, above n 50.

68 Catherine Mobbs, 'National Forest Policy and Regional Forest Agreements' in Steven Dovers and Su Wild River (eds), *Managing Australia's Environment* (2003).

engagement to resolve complex and controversial issues in forest management.⁶⁹ Moreover, while much effort was put into developing assessment criteria under RFAs with scientific and public input, at the level of ongoing implementation, the agreements have proved opaque to many outsiders. A particular problem is the exemption of RFAs from the usual requirements of federal environmental impact assessment law, which some believe has permitted State governments to evade proper scrutiny of the impact of their forest management practices.⁷⁰ A key lesson for REDD implementation from the Australian model is that these agreements require ongoing political support and commitment from all parties to continue to be effective. Changes in government can lead to changing policy priorities, which may impact upon government responses to such agreements and the future commitments that they entail.

IV MONITORING AND ACCOUNTING ISSUES

Monitoring, reporting and verification of forest carbon stocks, changes in these stocks and the resulting GHG emissions, are critical technical challenges in REDD implementation.⁷¹ Monitoring, reporting and verification systems for annual reporting for REDD will require the integration of remotely sensed data and ground measurements for the assessment of forest carbon stocks, stock changes and other GHG emissions. Such reporting will need to be sufficiently accurate and precise in order to ensure that the credits that are generated have integrity so that they are marketable and tradable.⁷² From a technical perspective there are two broad challenges. The first is measuring the change in forest carbon stocks associated with the conversion of forest to other land uses (eg agricultural crops or pastures), afforestation or natural forest regeneration associated with agricultural land abandonment. The second challenge lies in assessing changes in forest carbon stocks in areas of forest that remain forested but are potentially subject to degradation. For GHG accounting purposes, the precise definition of forest degradation has not been agreed on but it is likely to be considered as the long-term reduction in forest carbon stocks resulting from human-induced activities.⁷³

69 Marcus Lane, 'Regional Forest Agreements: Resolving Resource Conflicts or Managing Resource Politics?' (1999) 37 *Australian Geographical Studies* 142.

70 For discussion, see Jacqueline Peel, 'Ecologically Sustainable Development: More than Mere Lip Service?' (2008) 12 *Australasian Journal of Natural Resources Law and Policy* 1.

71 Holly Gibbs et al, 'Monitoring and Estimating Tropical Forest Carbon Stocks: Making REDD a Reality' (2007) 2 *Environmental Research Letters* 045023; Markku Kanninen et al, *Do Trees Grow on Money? The Implications of Deforestation Research for Policies to Promote REDD* (2007).

72 GOF-C-GOLD, *A Sourcebook of Methods and Procedures for Monitoring and Reporting Anthropogenic Greenhouse Gas Emissions and Removals Caused by Deforestation, Gains and Losses of Carbon Stocks in Forests Remaining Forests, and Forestation* (2009).

73 Rodney Keenan, 'Disturbance, Degradation and Recovery: Forest Dynamics and Climate Change Mitigation' (Paper presented at the XIII World Forestry Congress, Buenos Aires, 18–23 October 2009); Dieter Schoene et al, 'Definitional Issues Related to Reducing Emissions from Deforestation in Developing Countries' (Working Paper No 5, Food and Agriculture Organization of the United Nations (Forests and Climate Change), 2007).

Carbon is present in forests in above, and below ground living and non-living biomass pools. The largest and most important pool of carbon in tropical forests is above ground live biomass in woody plant material, which provides the foundation of carbon estimates.⁷⁴ Other carbon pools in tropical forests include fine litter, coarse woody debris, below ground live biomass in root material, and soil organic carbon. Different measurement techniques are required to assess carbon allocation and cycling for estimating rates and emission of carbon through decay and respiration.⁷⁵ In particular, estimates of the decay of litter and woody debris are required as they are the major source of emitted CO₂ in forest ecosystems and vary significantly with temperature, elevation and the chemical properties of the decaying wood or leaves.

A Monitoring GHG Emissions from Deforestation or Forest Degradation

The estimation of GHG emissions associated with activities such as deforestation or forest degradation needs to involve an assessment of the land area subject to the activity and the degree of impact on carbon stocks associated with the activity. The IPCC provides guidance on reporting greenhouse gas emissions in the land use, land use change and forestry sector.⁷⁶ In this guidance, the IPCC has established different tiers of assessment depending on the importance of the activity to a country's overall emissions profile and the extent of local data availability. Tier 1 assessment provides less precise and certain estimates based on generic default values for different vegetation types in different regions. By contrast, Tier 3 assessment requires estimation of carbon stock change using detailed national forest inventory data supplemented by dynamic models or allometric equations calibrated to national circumstances.⁷⁷ This more rigorous level of scrutiny allows for a variety of methods but implementation may differ from one country to another, due to differences in inventory methods and forest conditions. Further, proper documentation of the validity and completeness of the data, assumptions, equations and models used is a critical issue.⁷⁸

74 Julian Fox et al, 'Assessment of Aboveground Carbon in Primary and Selectively Harvested Tropical Forest in Papua New Guinea' (2010) *Biotropica*, yet to be published, but available online at Wiley InterScience, *Biotropica* Early View (2010) <<http://www3.interscience.wiley.com/cgi-bin/fulltext/123268647/PDFSTART>> at 13 April 2010.

75 Dan Metcalfe et al, *Measuring Tropical Forest Carbon Allocation and Cycling*, *RAINFOR Field Manual* (2009).

76 Intergovernmental Panel on Climate Change, *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (2006).

77 Using remotely-sensed data can support the design of an efficient field sampling method for the assessment of carbon stocks by defining stratum and identifying areas of higher spatial variability. In turn this provides a basis for field sampling of carbon pools within these strata. Intensity of sampling is then based on the degree of variability in the stratum and the desired error bounds for the estimate: Sheila Wertz-Kanounnikoff et al, 'How Can We Monitor, Report and Verify Carbon Emissions from Forests?' in Arild Angelsen (ed), *Moving ahead with REDD: Issues, Options and Implications* (2009) 87.

78 Intergovernmental Panel on Climate Change, *Good Practice Guidance*, above n 76.

An estimation of changes in forest carbon stocks can be based on analysis of differences in remotely sensed imagery over time combined with measurements on temporary or permanent sample plots and computer models of forest dynamics. Uncertainties in field based estimates of stock and stock change are present in calculations, and these uncertainties can inflate errors associated with estimates of GHG emissions.⁷⁹ Incomplete field data, in particular, can result in highly uncertain estimates. This may compromise the implementation of REDD which relies upon verifiable changes in carbon stocks in order to assign value to a particular REDD activity.⁸⁰ Therefore, field sampling efforts should ideally target those carbon pools that exert the greatest influence on, and reduce uncertainty in, final estimates. Sampling should also focus on the carbon pools most affected by changed land-use practices.

B Other Methodological Issues

All GHG inventory sectors require assessment of uncertainty, quality assurance and quality control procedures, procedures for ensuring consistency over time and independent verification. There have been various approaches put forward as to how uncertainty estimates might be used to manage risk in the inclusion of afforestation credits in an emissions trading system. However, the extent to which uncertainty might be used to limit the use of REDD related credits has not yet been resolved.

Other methodological issues in accounting for reduced emissions from deforestation and forest degradation include establishing an appropriate baseline, ensuring additionality and preventing leakage, and incorporating the effects of disturbances, such as fire or insect pests, successional dynamics and the longer-term impacts of historical and customary land use practices. Management issues that need to be considered include the effect of changes in forest harvesting, silvicultural practices and biodiversity conservation objectives.

Three alternative baseline options for REDD are currently under consideration within the international climate change regime. The first involves maintaining a base year of 1990, the level used as a basis for the emissions reduction targets established for Annex I parties by the *Kyoto Protocol*. The second option would employ net emissions over a 'base period' covering a number of years in order to produce a reference carbon stock change. The final option requires the development of a 'forward-looking' baseline founded upon 'business-as-usual' deforestation and forest degradation scenarios. Assessing carbon dynamics over a longer period pursuant to the second option would reduce the effect of imbalances in forest age-classes due to past human or natural disturbance. However, the period selected would need to cover a full cycle of plantation management (10 – 40 years) or even longer for cycles of wildfire and regrowth. The challenges with respect to the

79 Jerome Chave et al, 'Error Propagation and Scaling for Tropical Forest Biomass Estimates' 359 *Philosophical Transactions of the Royal Society of London Series B — Biological Sciences* 409.

80 Giacomo Grassi et al, 'Applying the Conservativeness Principle to REDD to Deal with the Uncertainties of the Estimates' (2008) 3 *Environmental Research Letters* 035005.

forward-looking baseline option are determining the forward period, establishing a credible and verifiable baseline for that period, and considering the potential impact of a carbon price.

V FORESTRY MANAGEMENT, TENURE AND CO-BENEFITS

The uncertainties of scientific and technical calculations of emissions reductions in terms of either baseline assessments or ongoing implementation sit alongside a growing awareness that effective assessment of the performance of REDD activities, including specific monitoring, will be vital to ensuring compliance and verification. Such international regimes must interface at a local level with both formal and informal tenure arrangements, land use and resource practices and forms of communal governance that occur in many countries where there is substantial forest cover.⁸¹ Without such interface between international climate law regimes and local systems of governance important issues will remain in abeyance, such as delineating the actual ‘ownership’ of the carbon sequestration capacity,⁸² and the possibilities for access and use in relation to the surrounding forested areas.

The following sections canvass different models that have been used in the Australian context to define and regulate tenure and contractual arrangements with respect to forests and carbon stocks. They encompass statutory models recognising carbon sequestration rights, contractual and property arrangements, ecosystem services models and partnership arrangements.

A Statutory Models

Increasing appreciation of the carbon sequestration capacity in forests and vegetation and a decrease in uncertainties surrounding scientific and technical possibilities for monitoring and compliance have generated a regulatory response that defines specific rights to carbon sequestration independently of the rights held with respect to the actual trees in which the carbon is stored and independent of the land on which such trees and vegetation is physically located. For example, all Australian states⁸³ now have legislation to regulate and recognise the existence of forestry rights and Carbon Sequestration Rights (‘CSR’). As no specific Commonwealth legislation currently exists in respect of bio-sequestration capacity, such rights are primarily regulated under state jurisdiction at this point in time.

81 Kristy Graham and Amelia Thorpe, ‘Community-Based Monitoring, Reporting and Verification of REDD Projects’ (2008) 3 *Carbon and Climate Law Review* 303, 305.

82 The term ownership is used advisably here as there could be a plethora of legal and customary rights entailed in defining this aspect.

83 This excludes Australian territories, as the Australian Capital Territory and the Northern Territory do not yet have such legislation.

Specific legislation was regarded as necessary to establish CSR as it is unclear whether legal rights to forest property and sequestered carbon can actually exist without legislation. Generally speaking, at common law, all ‘things’ attached to the land are regarded as part of the land.⁸⁴ However it is possible at common law to create an interest in land where the land in question belongs to someone else. For example, a profit a prendre, is a legal interest apart from the land itself which confers the right to take, and sell, something that ‘naturally occurs’ on land owned by another party.⁸⁵ At times, trees for example, have been held to be a profit a prendre.⁸⁶ In other situations it is more difficult to determine the exact nature of the rights. Therefore it would be complex, if not impossible, to develop a coherent range of forestry and CSR without a regulatory framework to define the respective rights and responsibilities at law.

The certainty afforded to forestry rights and carbon sequestration capacity enshrined in legislation is regarded as critical to the investment in carbon, and to any subsequent carbon markets that may develop if a federal Carbon Pollution Reduction Scheme (‘CPRS’) comes into existence and in light of any international public law regime or voluntary schemes that that may develop. Specific legal recognition of rights to carbon sequestration independent of owning the land itself ‘create[s] ... flexibility in the ability to manage forest products [and] carbon credits ... over time’.⁸⁷ An important aspect of such specific and defined rights is the recording of such rights on the relevant land title. The recording of this interest ‘runs with the land’, and binds future landowners, ensuring protection of vegetation when land ownership changes.⁸⁸ Such statutory models provide a relatively precise definition to carbon sequestration ‘ownership’ which could potentially then be adopted by developing countries under the proposed REDD schemes. However, there are a number of factors complicating the situation in developing countries which may militate against the adoption of a direct statutory model. Typically, such statutory models assume that the carbon rights will be held by private third parties. In countries where forest resources are vested in the nation state or provincial governments, and the lands on which forests grow are public lands held by the state, then the statutory identification of a separate carbon right may be highly problematic, especially where such rights might conflict with customary local community claims.⁸⁹ Thus the localised operation of REDD schemes will be an important aspect to consider in terms of designing and implementing effective models that allow benefit flows to local communities.

84 See generally Adrian Bradbrook, Susan Macallum and Anthony Moore, *Australian Real Property Law* (3rd ed, 2002) 585.

85 *Ellison v Vukicevic* (1986) 7 NSWLR 104.

86 *Corporate Affairs Commissioner v ASC Timber Pty Ltd* (1989) 18 NSWLR 577.

87 David Hodgkinson and Renee Garner, *Global Climate Change: Australian Law and Policy* (2008) 148.

88 *Ibid.*

89 These issues are discovered further in respect of tenure models below.

B Contractual and Property Arrangements

Programs such as the Regional Forestry Agreements discussed earlier (which were agreed at a nation-wide level) have often included ‘co-benefits’ in terms of socio-economic packages or transitional support for various industry sectors. In addition, there have been a number of localised initiatives operative within the contractual and property sphere within Australia that also have sought to combine forestry and vegetation management with forms of economic,⁹⁰ or cultural benefits.⁹¹ Indeed, over time there has been a trend from single-purpose instruments designed primarily to achieve conservation goals⁹² to more multifaceted regulatory tools.⁹³ The rise of ecosystem service concepts has been important in this changing orientation,⁹⁴ as part of a broader move to adopt market environmental measures.⁹⁵

Market environmentalism, denoting a complex of regulatory, structural economic social, cultural and institutional changes, has assumed an increasing role in forestry and vegetation management and in environmental protection over the last two decades.⁹⁶ Within Australia this impetus has generated a plethora of new modes of governing forests and areas of native vegetation. In certain circumstances, these new modes may work in conjunction with traditional legal forms or may refashion old models to new uses. The covenant on title is one such instance that in more recent years has been transformed in its use as a conservation covenant.⁹⁷

1 Covenants

Covenants have a very ancient lineage in common law legal systems, sitting at the interface of contract law and property law,⁹⁸ and clearly illustrating the mutuality

90 See, eg, Susan Shearing, ‘Taxation Incentives for Conservation Covenants’ (2006) 11 *Local Government Law Journal* 139, 140–3.

91 See, eg, Emily Gerrard, ‘Impacts and Opportunities of Climate Change: Indigenous Participation in Environmental Markets’ (Discussion Paper No 3(13), Native Title Research Unit, 2008).

92 See, eg, Department for Sustainability and Environment, *Victoria’s Native Vegetation Management: A Framework for Action* (2002) <[http://www.dse.vic.gov.au/CA256F310024B628/0/C2E5826C9464A9ECCA2570B400198B44/\\$File/Native+Vegetation+Management+-+A+Framework+for+Action.pdf](http://www.dse.vic.gov.au/CA256F310024B628/0/C2E5826C9464A9ECCA2570B400198B44/$File/Native+Vegetation+Management+-+A+Framework+for+Action.pdf)> at 16 December 2009. For a discussion see also Rachael Webb, ‘Victoria’s Native Vegetation Framework — Achieving “Net Gain” at the Urban Growth Boundary’ (2009) 26 *Environmental and Planning Law Journal* 236, 238–44.

93 There are numerous examples but some measures operative in the indigenous policy area are discussed in Jon Altman ‘Sustainable Development Options on Aboriginal Land: The Hybrid Economy of the Twenty-First Century’ (Discussion Paper No 226, Centre for Aboriginal Economic Policy Research, Australian National University, Canberra, 2001) 10–15; see also David Campbell, Jocelyn Davies and John Wakerman, ‘Realising Economies in the Joint Supply of Health and Environmental Services in Aboriginal Central Australia’ (Working Paper No 11, Desert Knowledge CRC, 2007) 8–9.

94 James Salzman, ‘Creating Markets for Ecosystem Services: Notes from the Field’ (2005) 80 *New York University Law Review* 870, 884–8.

95 Robyn Eckersley, ‘Markets, the State and the Environment: An Overview’ in Robyn Eckersley *Markets, the State, and the Environment: Towards Integration* (1st ed, 1995) 1–2.

96 *Ibid* 7. See also Peter Williams, ‘Use of Transferable Development Rights as a Growth Management Tool’ (2004) 21 *Environmental and Planning Law Journal* 105, 106–8.

97 Alexander Danne, ‘Voluntary Environmental Agreements in Australia’ (2003) 20 *Environmental and Planning Law Journal* 287, 293.

98 Bradbrook, Macallum and Moore, above n 84, 735.

of right and obligation (trade) embedded in property constructs. While covenants, often expressed as promises or agreements, are integral to defining many interests in land at common law, the restrictive covenant which emerged in the nineteenth century was a creature of equity.⁹⁹ In essence, a restrictive covenant imposed a negative prohibition on the use of another person's adjoining land.¹⁰⁰ In this context, it is feasible that covenants could be entered into which impose restrictions on land-use, such as requiring that land not be cleared of forest.¹⁰¹ Provided that the 'restriction' was cast in negative terms, such as avoiding deforestation, then conceivably it may be possible to use these legal forms in a REDD-type context, especially in countries of common law jurisdiction, such as in India and Malaysia.

Covenants 'run with the land'; that is to say, that the restriction 'attaches' to the title of the 'burdened' land. Typically, as the covenant is recorded in registration systems on the title of the land on which it occurs, the covenant provides a public and transparent format for notifying that carbon sequestration rights are in place. This intermeshing of the specific legal model with the land and resource registration and titling system provides a strong degree of permanency to the arrangements, which is consistent with long-term monitoring and verification requirements at international law. In this manner also, the restrictions on clearing that allow carbon sequestration to continue over long periods are enforceable against not only the original landowner but also successors in title to that original landowner.¹⁰² Such continuity can be an important consideration where, for example, a corporation that may have originally owned the land is dissolved due to financial concerns.

This factor provides an important basis for distinguishing the covenant from many similar, contractual arrangements which may not be enforceable against successors in title.¹⁰³ Thus, a new landowner buying land where there is only a contractual arrangement in place to 'avoid deforestation' may not be bound by this obligation as that person was not a party to the original agreement. Covenant-based models, in association with land registration systems, provide a strong basis for security in the continuity of the rights associated with any carbon sequestration capacity in forests. Yet it needs to be remembered that land

99 *Tulk v Moxhay* (1848) 41 ER 1143 (Ch).

100 The classic example of a restrictive covenant is where one land owner has an enforceable right against an adjoining landowner where that land owner may not build a building above a certain height. See Bradbrook, Macallum and Moore, above n 84, 736.

101 See Nicola Durrant, 'Legal Issues in Carbon Sequestration: Carbon Sinks, Carbon Rights and Carbon Trading' (2008) 31 *University New South Wales Law Journal* 906, 914–15.

102 The doctrine of privity provides that covenants may usually only be enforced by the original contracting parties. See Bradbrook, Macallum and Moore, above n 84, 737.

103 In some jurisdictions, the doctrine of privity will restrict enforcement of contractual provisions by third parties. It is possible to provide for contractual measures to seek to overcome this problem but they are often cumbersome. Statutory reform has occurred in several jurisdictions, see, eg, *Property Law Act 1974* (Qld) s 55(1). Comparative examples include *New Zealand Contract (Privity) Act 1982* (NZ) s 4; and in the United Kingdom, at least in part, through *Contracts (Rights of Third Parties) Act 1999* (UK) c 31, s 1. Under civil law parties to a contract may agree that contractual rights can be transferred to third party: see, eg, *Civil Code* (Germany) § 328 [Langenscheidt Translation Service trans, *Bürgerliches Gesetzbuch* [Civil Code] (Germany)].

registration systems are often rather rudimentary or non-existent in some of the more remote areas where the REDD projects may operate.¹⁰⁴

The issue of just how to enforce REDD-style performance and monitoring over time will need to be addressed ‘outside’ contractual parameters, or as an element of any REDD style project contract that is negotiated. These important questions have received little attention to date.¹⁰⁵ Clearly, in respect of the scientific and technical uncertainties in monitoring and assessment, it will not be possible to assume an absolute permanency for carbon sequestration in any forest or vegetated area. Risks such as bushfire and natural disasters will occur, as well as shifting forest definitions and management practices. Therefore, apportioning the risks will be a complex task, with current proposals ranging from additional security and insurance components to international risk sharing arrangements between developing and developed nations.¹⁰⁶ Such questions will be particularly critical if a ‘project’ style REDD scheme is implemented under the UNFCCC framework as these issues will need to be addressed on a case-by-case basis.

The problem of how to deal with obligations that must exist over long periods of time and which must be enforceable by third parties, where the original parties may no longer be in existence, is one that property law has grappled with over many hundreds of years. The problem finds new resonances in the REDD situation where it will be necessary to ensure that REDD style benefits generated from carbon sequestration continue over extended time frames. However, a positive obligation to maintain any such forest, or to revegetate the land in a manner which might satisfy ‘performance’ in relation to REDD type assessment criteria would be difficult to instigate, and arguably not able to be given effect at law under traditional covenant law.¹⁰⁷ Moreover, the covenant is a blunt instrument for achieving social and policy goals, such as the expansive co-benefits that are envisaged for forest-dwelling communities. The traditional focus of covenant law remains concentrated on the land and resource titles rather than social outcomes. However, the basic idea underpinning the covenant — that there is an enforceable agreement over time whereby one person is able to control land and resource use on another’s land — has formed the foundation for many conservation-based covenant regimes applicable to forested areas.

2 Conservation Covenants

Modifications to the basic covenant idea to allow greater flexibility have occurred in several ways, largely through statutory reforms and initiatives. In many

104 See Jude Wallace, ‘Managing Social Tenures’ in Lee Godden and Maureen Tehan (eds), *Comparative Perspectives on Communal Lands and Individual Ownership: Sustainable Futures* (2010) 26-27. The utility of registration systems in delivering benefits for local forest communities is discussed further below.

105 A significant exception is the work by the Nicholas Institute at Duke University. See Olander et al, above n 36, 43–5.

106 For an overview of different liability management options see Michael Dutschke and Arild Angelsen, ‘How Do We Ensure Permanence and Assign Liability’ in Arild Angelsen (ed) *Moving Ahead with REDD* (2009) ch 8, 77–85.

107 Together with the highly technical requirements needed to enforce restrictive covenants, the negative character poses a barrier to implementing these traditional forms.

statutory covenant schemes, there is no longer a requirement that the obligations incurred are negative in their effect i.e. prohibiting certain uses.¹⁰⁸ Rather, many statutory covenants cast positive obligations such as maintaining the levels of biodiversity on the encumbered land.¹⁰⁹ A conservation covenant model is well established in urban and rural contexts in many countries. In countries like the United States and Canada, the model is designated as a conservation easement,¹¹⁰ and it will often function in conjunction with taxation incentives.¹¹¹ Another example in the Victorian context are Trust for Nature Conservation Covenants; voluntary but legally-binding agreements between landholders and Trust for Nature (a statutory trust) to permanently protect the natural heritage occurring on private land, even if it is sold. Conservation Covenants are backed by State legislation through the *Conservation Trust Act 1972* (Vic). Typically, there is a greater degree of flexibility in the range of obligations that can be negotiated in the statutory covenants, although the focus remains upon securing public interest benefits.¹¹²

Greater recognition of the need to preserve forested areas and vegetative cover beyond the formal protected areas reserve system, has seen conservation covenants of various forms emerge as important legal mechanisms for conservation on private land,¹¹³ and at times, on public lands held under Crown tenure. Basically, a conservation covenant comprises a legally binding agreement between a land holder and either a government body, such as a local council, or a non-government organisation, which imposes long term obligations on the land owner to conserve various environmental components: typically forest or native vegetation. For instance, many so-called property 'offset' schemes allow either private or government authorities the capacity to control, in defined ways, the land-use on land, or a portion of it, over which they do not hold title,¹¹⁴ and which may be situated some distance from those groups that seek to gain the benefit.

108 For example see statutory covenants that can be affected pursuant to the *Planning and Environment Act 1987* (Vic) ss 173, 174.

109 The covenant remains on the title of a property. Trust for Nature currently has more than 960 Conservation Covenants. For information on Trust for Nature Schemes, see Trust for Nature, *Conservation Covenants Across Victoria* <<http://www.trustfornature.org.au/content.asp?PageId=166>> at 14 April 2010.

110 A total of 17 847 conservation easements were in place in the USA in 2003 with numbers increasing: see Nancy McLaughlin, 'Rethinking the Perpetual Nature of Conservation Easements' (2005) 29 *Harvard Environmental Law Review* 421, 423.

111 Shearing suggests that offering a viable taxation concession scheme would enhance the attractiveness of conservation covenants, although the recent experience in Australia with managed investment funds in the plantation forestry sector may be a basis for the rigorous oversight of any form of financial incentives including the proposed REDD credit exchange mechanism or the public funds model: Shearing, above n 90, 143.

112 James A Fitzsimmons, 'Private Protected Areas? Assessing the Suitability for Incorporating Conservation Agreements over Private Land into the National Reserve System: A Case Study of Victoria' (2006) 23 *Environmental and Planning Law Journal* 365, 369–75.

113 David Farrier, 'Fragmented Law in Fragmented Landscapes: The Slow Evolution of Integrated Natural Resource Management Legislation in NSW' (2002) 19 *Environmental And Planning Law Journal* 89.

114 The terminology of title is preferred to that of ownership as there can be 'ownership' of many various types of rights and interests in land and resources.

Covenants have particular utility in respect of smaller parcels of land where forest or vegetation cover may be fragmented.¹¹⁵ An expansion of the scale and geographic location of these types of mechanisms is evident in the development of the REDD scheme concept. However, whether such covenants could be negotiated over the much larger areas needed to secure emissions reductions in tropical forests, for example, remains more speculative. Further while it would seem possible to incorporate the specific monitoring and assessment obligations required for REDD verification into a conservation type covenant, the level of technical expertise needed in drafting such documentation typically may not be available at a local community level. In such instances there is a danger that such arrangements would be drawn up as standard-form ‘contracts’ where local landowners or those groups holding customary rights would have little opportunity to modify obligations, and which may therefore work to their disadvantage.

C Climate Change Mitigation and Forestry ‘Credits’

At the federal level, a major reorientation of Australia’s climate change policy since 2007 has seen the federal government release draft exposure legislation for a CPRS.¹¹⁶ Many aspects of the proposed emissions trading scheme have proven highly contentious, and it remains unclear whether the Bills will be implemented. Indeed, in May 2010, following the disappointing result of the Copenhagen conference and facing opposition to the Bills in the Senate, the government announced that it would postpone further consideration of the scheme until after 2012. In its draft legislation, the federal government initially did not favour ‘supplementary polices’ to the core emissions trading scheme.¹¹⁷ Following criticism of the exclusivity of the CPRS approach, the federal government announced a scheme to facilitate individual, ‘voluntary’ purchase and subsequent ‘retirement’ of Australian Emissions Units (‘AEU’ — the proposed credit unit under the CPRS) through the forestry sector. At this stage there remain ‘opt in’ provisions for voluntary forestry projects,¹¹⁸ with the potential for credits to be generated under reforestation schemes. Given the possibility that some form of emissions trading scheme may still be introduced that may cover the forestry sector, the following discussion examines the relevant provisions under the CPRS draft legislation.

Part 10 of the CPRS Bill deals with the proposed forest sequestration schemes, outlining the basic legal nature of the rights created under the proposed carbon

115 Shearing above n 90, 141.

116 Carbon Pollution Reduction Scheme Bill 2009 (Cth); Australian Climate Change Regulatory Authority Bill 2009 (Cth); Carbon Pollution Reduction Scheme (Consequential Amendments) Bill 2009 (Cth); Carbon Pollution Reduction Scheme (Charges — General) Bill 2009 (Cth); Carbon Pollution Reduction Scheme (Charges — Excise) Bill 2009 (Cth); Carbon Pollution Reduction Scheme (Charges — Customs) Bill 2009 (Cth).

117 This position largely reflected the Garnaut Review and Productivity Commission viewpoint. See eg, Productivity Commission, *What Role for Policies to Supplement an Emissions Trading Scheme?* (2008) Submission to the Garnaut Climate Change Review <<http://www.pc.gov.au/research/submission/garnaut>> at 14 April 2010.

118 Carbon Pollution Reduction Scheme Bill 2009 (Cth) pt 10.

sequestration model. Basically the scheme is not mandatory but allows ‘covered industries’ to purchase additional AEU’s where there is compliance with part 10. The holder of such credits must concurrently hold a certificate of reforestation in order to receive a defined number of ‘free’ AEU’s. The units are to be treated as personal property and can be sold.¹¹⁹ Units to be issued will be calculated with respect to the number of tonnes of emissions removed by the relevant ‘forest’ over a five year reporting period. Even so, the process of accurately defining the respective forest cover may prove to be fraught with difficulties, although the Bill adopts the Kyoto Protocol definition of ‘recognised’ reforestation projects. The issue of a certificate of reforestation will require that there is a carbon sequestration right for a nominated project operating in conjunction with a project manager. A project manager is an entity that complies with the Australian Climate Change Regulatory Authority’s determination of a recognised reforestation entity.¹²⁰ Core responsibilities of a project manager lie in compliance with a ‘forest maintenance obligation’ which is set as a statutory legal duty.¹²¹ Basically, the nature of the duty is not to engage in conduct that will deplete or remove the trees in the forest area. There are set reporting requirements and the breach of a forest maintenance obligation will render a ‘person’ liable to enforcement, which includes forest restoration orders, imposition of civil penalties and injunctions.¹²² In addition, State governments in Australia have legislated to separate rights to carbon in timber from the land on which trees are grown,¹²³ paving the way for this carbon offset trading.¹²⁴ The federal and state legislative schemes will need to interact. The CPRS Bill, in line with constitutional divisions of power over resources, does not establish the carbon sequestration ‘right’ but relies on state enactments that are to be compatible with part 10 of the CPRS Bill. Further, the schemes are to be integrated with state-based ‘Torrens’ land registration systems.

The CPRS scheme deals with reforestation, rather than avoided deforestation and degradation. However, these statutory provisions have been outlined at some length to indicate the complexity and intersecting legislative and compliance frameworks that are required to implement any comprehensive forestry-based system for reducing GHG emissions. It is also worth noting that the Australian Government chose to exclude reduced deforestation from the proposed emissions trading scheme despite the fact that deforestation continues in Australia and further reductions will make a continuing contribution to our climate change mitigation objectives. The comprehensive legislative and administrative support required to implement REDD schemes is thereby highlighted, especially in terms

119 Carbon Pollution Reduction Scheme Bill 2009 (Cth) ss 94, 191, 192.

120 Carbon Pollution Reduction Scheme Bill 2009 (Cth) s 195.

121 Carbon Pollution Reduction Scheme Bill 2009 (Cth) s 226.

122 Carbon Pollution Reduction Scheme Bill 2009 (Cth) s 226(9), 226C, 227–31.

123 See, eg, *Carbon Rights Legislation Amendment Act 1998* (NSW) amending Pt 6 Div 4 of the *Conveyancing Act 1919* (NSW); *Forestry Rights (Amendment) Act 2000* (Vic) amending the *Forestry Rights Act 1996* (Vic); *Forest Property Act 2000* (SA) s 3A; *Forestry and Land Title Act 2001* (Qld) inserting Pt 6B into the *Forestry Act 1959* (Qld); *Forestry Rights Registration Act 1990* (Tas); *Carbon Rights Act 2003* (WA).

124 Andrew Thompson and Robb Campbell-Watt, ‘Carbon Rights — Development of the Legal Framework for a Trading Market’ (2004) 22 *Journal of Energy and Natural Resources Law* 465, 470–2.

of the institutional capacity that will be required of many developing nations. These more specific mechanisms fall into a wider category that can be broadly described as ecosystem services or environmental markets.

1 Ecosystem Service Models

Ecosystem service models share several characteristics with covenants and formal legislative forestry-based trading schemes. At essence an ecosystem service is a payment for an environmentally embedded service by those entities that seek to gain a benefit but which do not directly have title to the land/resources that will provide the services. While there has been a general awareness of the functions provided by ecosystems in the past, efforts to identify and calculate these contributions to social welfare are only recently gaining decisive recognition.¹²⁵

Many proposals are now emerging for trade in ecosystem services, which embrace various aspects of biodiversity conservation, drought and flood mitigation projects or the stabilisation of the climate.¹²⁶ Typically, these ‘services’ have not been traded in the past on a market basis. Accordingly, their regulation is often seen as requiring the creation of property rights in ecosystems or specific components of ecosystems. Alternatively, it is possible to view such services as being provided on a contractual or licence basis in return for payment by other parties. Often such payment will occur by way of a general levy or taxation measure.¹²⁷

Ecosystem service mechanisms can range from wetland mitigation banking in urban and coastal regions,¹²⁸ to recent initiatives in the rural biodiversity protection and carbon sequestration field in Victoria such as *EcoTender* and *BushTender*.¹²⁹ In *BushTender*, landholders nominate their price for the environmental management services they seek to offer to better protect and improve their native vegetation. This price is submitted as a bid, which is compared with bids from other participating landholders. Successful bids are ones judged to offer best value for money against set criteria. Successful landholders receive periodic payments for their services under management agreements signed with the relevant government department.¹³⁰ Similar schemes already exist within the voluntary carbon offsets market¹³¹ and voluntary REDD style schemes, and it will be further extended

125 Salzman, above n 94, 871.

126 For one such proposal see Judson Agius, ‘Biodiversity Credits: Creating Missing Markets for Biodiversity’ (2001) 18 *Environmental and Planning Law Journal* 481.

127 Shearing, above n 90, 141–2.

128 See United States Environmental Protection Agency, *Mitigation Banking Factsheet* (2009) <<http://www.epa.gov/owow/wetlands/facts/fact16.html>> at 16 December 2009.

129 Department of Sustainability and Environment, *Conservation and Environment* <<http://www.dse.vic.gov.au/DSE/nrence.nsf>> at 16 December 2009.

130 Department of Sustainability and Environment, State of Victoria, *BushTender: Rethinking Investment for Native Vegetation Outcomes: The Application of Auctions for Securing Private Land Management Agreements* (2008) 4–5.

131 Lisa Moore, ‘Voluntary Carbon Offsets: A Legal Perspective’ in Wayne Gumley and Trevor Daya-Winterbottom (eds), *Climate Change Law: Comparative, Contractual and Regulatory Considerations* (2008) 159, 166.

within the public international law sphere should agreement be reached post Copenhagen.¹³²

While innovative models are emerging to protect native vegetation (and to a lesser extent forested areas) under such schemes, large landscape-scale protection has not occurred as yet. Experience in developed countries suggests that ecosystem service payments often cannot match the opportunity costs of other economic activities that might be open to the landholder.¹³³ Similar questions arise with REDD projects where the price paid for REDD activities will need to be at least comparable to income that might be derived from cash crops or equivalent land-use consequent upon forest clearance. However, the utility of the generic ecosystem service model as a template for REDD is clear, with carbon sequestration being the most obvious benefit to flow in return for payments thus generating an additional income stream for local communities, although biodiversity outcomes are seen as important.¹³⁴

Yet from the ecosystem service models, it is also apparent that a high level of resourcing is necessary to adequately assess performance and for monitoring. The *BushTender* and *BushBroker* schemes are based on detailed agreements that set out a management plan which includes annual reporting requirements. Both schemes envision active on-site management for at least ten years with the help of a land management plan and ongoing protection of native vegetation. A site visit and assessment by government officers help to evaluate the site and set out the management plan accordingly. By contrast, such public resource imperatives may not be readily met by many developing countries given many urgent and competing social and economic needs. Thus the technical and legal issues that will need to be effected under REDD schemes to ensure that global emissions objectives are met, must also be evaluated alongside the quite intensive resource requirements needed to give effect to such schemes. Simultaneously, it will be necessary to ensure local concerns of equity, and benefits for forest-dwelling communities are not compromised.

D Partnership Models

Such multiplicity of aims for regulatory mechanisms appears daunting, but more complex models for implementing forestry and environmental management in concert with social economic and cultural imperatives have been emerging in various jurisdictions. These initiatives are examined below under the rubric of 'partnerships' with indigenous peoples, although other terminology, including co-

132 Elisabeth Rosenthal, 'Deal Seen Near for Payments to Save Forests', *The New York Times* (New York), 16 December 2009, A1.

133 Rachael Webb, 'Victoria's Native Vegetation Framework — Achieving "Net Gain" at the Urban Growth Boundary' (2009) 26 *Environmental and Planning Law Journal* 236, 247.

134 Not all commentators are sanguine about the ability of REDD style projects to achieve both carbon reduction and biodiversity protection goals. For a discussion see Andrew Long, 'Taking Adaptation Value Seriously: Designing REDD to Protect Biodiversity' (2009) 3 *Carbon and Climate Law Review* 314, 321.

management,¹³⁵ is often employed. The following examples look to partnerships which engage indigenous peoples as active environmental ‘managers’. These involve situations where the underpinning tenure and landholding model may vary widely from a situation where there is no formal legal recognition of customary rights, to those where there is formal legal recognition accorded to customary and indigenous land-holding.

1 Indigenous Co-management Arrangements

Within Australia over the last few decades, there has emerged significant institutional capacity at a governmental and non-governmental level in working with indigenous communities in conservation and natural resource management. The process has not always been smooth, and there remain substantial gaps in the effective involvement of indigenous peoples. Nonetheless, there exists several models, particularly at a national level that can offer a basis for REDD style partnerships. In Australia, federal environmental protection and Indigenous participation in land, environment and forest management are principally governed by the interaction between the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (‘EPBC Act’) and the *Native Title Act 1993* (Cth), particularly those provisions relating to Indigenous Land Use Agreements (‘ILUAs’). ILUAs are not confined to co-management and conservation but may cover a wide range of land-uses. Nonetheless, many ILUAs do involve co-management regimes and in this way intersect with the broader conservation objectives of the federal environmental protection legislation. The objects of the EPBC Act include the:

promot[ion of] a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples [including assistance in implementing] ... Australia’s international environmental responsibilities.¹³⁶

The EPBC Act also stipulates management principles applicable to Indigenous Protected Areas and Commonwealth reserves. In respect of the latter, the EPBC Act stipulates majority Indigenous representation on boards to manage reserves.¹³⁷ Traditional usage rights such as non-commercial hunting or cultural activities are allowed on reserves, subject to regulations made for particular reserves in respect of biodiversity conservation. The EPBC Act also provides that Indigenous

135 David Llewellyn and Maureen Tehan, “‘Treaties’, ‘Agreements’, ‘Contracts’, and ‘Commitments’ — What’s in a Name? The Legal Force and Meaning of Different Forms of Agreement Making” (2005) 7 *Balayi: Culture Law and Colonialism* 6.

136 *Environment Protection and Biodiversity Conservation Act 1999* (Cth) s 3(1)(d)–(e). Other objectives include the: ‘recogni[tion of] the role of indigenous people in the conservation and ecologically sustainable use of Australia’s biodiversity’; ‘promot[ion of] the use of indigenous peoples’ knowledge of biodiversity’; and ‘promot[ion of] a partnership approach to environmental protection and biodiversity conservation’. *Environment Protection and Biodiversity Conservation Act 1999* (Cth) s 3(1)(f)–(g), (2)(g).

137 *Environment Protection and Biodiversity Conservation Act 1999* (Cth) s 374.

interests must be addressed in drafting 'bilateral agreements, management plans, recovery plans, wildlife conservation plans or threat abatement plans'.¹³⁸

Prior to the EPBC Act, joint or co-management regimes were a well established means of involving Indigenous communities in land and environmental management in Australia, beginning in the Northern Territory with the *Aboriginal Land Rights (Northern Territory) Act 1976* (Cth). Other states have enacted similar, albeit less effective, legislation. The first co-management agreement in Australia was made in 1981 over Garig Gunak Barlu National Park in the Northern Territory. Since that time, several models of co-management have emerged. These range from government ownership and an Aboriginal majority on the board of management with a lease granted to traditional owners, to absolute Aboriginal ownership with no lease-back arrangement to the government. There are presently several other types of co-management regimes involving Indigenous communities which are operative in Australia. These include: ILUAs; co-operative management agreements outside of the native title process (these may or may not include formal tenure recognition), including those relating to the management of natural resources and cultural heritage; and, Indigenous Protected Areas ('IPAs'). One of the most well-known, but arguably still contentious, co-management regimes is that governing the Uluru-Kata Tjuta National Park. The co-management agreement between the Commonwealth and the Anangu people is held to be founded upon Indigenous law — Tjukurpa, the Pitjantjatjara word for law, which governs history, knowledge, religion and morality in Anangu society. The Kakadu National Park is another frequently cited example of an effective co-management regime, although it too remains problematic in some aspects.

Building on these early initiatives, the range of co-management initiatives with indigenous peoples in major forested areas in Australia, including World Heritage sites like the Wet Tropics area in northern Queensland, is now extensive.¹³⁹ Further, the level of involvement of Indigenous peoples has increased significantly. Nonetheless, in situations where there is to be a devolution of power sharing in the decision-making processes for co-management, the process often remains fraught. Ongoing negotiations need to be maintained to ensure that Indigenous knowledge is effectively incorporated into co-management regimes.

This will also be a challenge for many REDD projects where the demands of transparency and accountability to the market stand in contrast to traditional knowledge practices and communal forms of decision-making that characterise indigenous and local communities.¹⁴⁰ More widely, in relation to REDD where conflicts may arise, the question arises as to whether Indigenous and or local customary management practices will prevail. Alternatively, will the necessity to comply with western scientific paradigms encapsulated within the performance assessment regimes take precedence?

138 Garth Netheim, Gary Meyers and Donna Craig, *Indigenous Peoples and Governance Structures: A Comparative Analysis of Land and Resource Management Rights* (2002) 396.

139 See, eg, *Wet Tropics of Queensland World Heritage Area Conservation Act 1994* (Cth) s 8.

140 Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (1990).

Concerns about the intersection of customary practices with western scientific, and technical paradigms, is also evident in South Africa. Isaacs and Mohamed describe opposing trends in co-management in South Africa: *co-management* based upon local community responsibility and ownership of resources, and *co-operation* with central state agencies or exercise of delegated responsibilities.¹⁴¹ These models of management exist along what has been described as a continuum of involvement — a ladder of participation. The extent of respective government and community involvement is specific to different contexts for environmental management, ranging from ‘philanthropy and coerced relationships to organic partnerships’.¹⁴² In order to move beyond the former into the category of the latter, the challenge for local communities is to utilise the paradigm shifts created by macro-economic policy change such as that precipitated by REDD as an opportunity to engage fully and meaningfully in the formulation and implementation of local protection and development objectives — to ‘move beyond coercion and consultation to full participation’.¹⁴³ These aims are consistent with the objectives expressed in the Negotiating Text which refer to principles which, ‘respect the knowledge and rights of indigenous peoples, and members of local communities and promote the full and effective participation of all relevant stakeholders’.¹⁴⁴

VI COMMUNITY AND CUSTOMARY RIGHTS IN FORESTED AREAS

A key component of ‘full participation’ where social and environmental co-benefits can be effectively achieved is an adequate recognition of local community and customary rights in forested areas. Yet, in itself, this recognition may be insufficient to accord a robust platform for local communities to gain significant benefits from carbon sequestration.¹⁴⁵ This key question sits within a constellation of potential formal rights including land ‘tenure’, nation-state vested resources and informal customary rights. Further, while the Negotiating Text cites the United Nations Declaration on the Rights of Indigenous Peoples,¹⁴⁶ the Declaration itself does not provide specific legal mechanisms to achieve recognition that are directly applicable in a REDD context. The critical question will remain as to

141 Moenieba Isaacs and Najma Mohamed, ‘Constituting the Commons: Co-managing the Commons in the “New” South Africa: Room for Manoeuvre?’ (Paper presented at the 8th Biennial Conference of the International Association for the Study of Common Property Bloomington, Indiana USA, 31 May – 4 June 2000) 4.

142 Ibid 2.

143 Ibid 18.

144 Principles — Safeguards 4(e) in UNFCCC, *Report of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention on its Seventh Session, Held in Bangkok from 28 September to 9 October 2009, and Barcelona from 2 to 6 November*, UN Doc FCCC/AWGLCA/2009/14 (2009) 92.

145 Lyster, above n 13, 445–6.

146 *Declaration on the Rights of Indigenous Peoples*, GA Res 61/295, UN GAOR, 61st sess, pt 1, 107th plen mtg, Agenda Item 68, Supp 53, UN Doc A/RES/61/295 (2007). The Declaration was adopted by the UN General Assembly on 13 September 2007 after 20 years of negotiations.

which groups hold the actual rights that are enforceable with respect to the carbon sequestration capacity,¹⁴⁷ and thus will gain the financial benefits. Indeed, there is a high degree of confusion about how rights to carbon sequestration should be implemented, enforced and ultimately made fungible while still protecting indigenous and local community interests.

In many models for implementing REDD it is assumed that the entity seeking to 'trade' or gain credit for the carbon sequestration also holds tenure over the relevant land. These discussions that simply equate tenure with 'ownership' reveal the degree of confusion and complexity operative around these constructs.¹⁴⁸ As noted, on one view it is possible to legally separate the carbon sequestration capacity from both the actual forests in which carbon will be stored and the land on which that forest stands, and which would be the subject of land tenure institutions. Whether in developing countries, such a free standing sequestration interest would be regarded as vesting in the nation-state or as private 'property' or another 'right' is an open question. Typically though, many other 'resource' rights such as forests and minerals are dealt with as vested resources in the nation state. Given that the imperatives of nation state sovereignty over resources remains a particularly contested dimension of international law, REDD scheme implementation models need to be cognisant of the degree to which such sequestration 'resources' may simply be held to vest in the state and therefore the opportunities to achieve co-benefits for local communities may be limited.

The Negotiating Text for REDD lacks sufficient clarity on these aspects as it refers to land tenure and forest governance in very generic terms,¹⁴⁹ without differentiating the various intersections of rights that might pertain in a forested area. If land tenure is taken to be the basis for establishing rights to carbon sequestration 'credits', then particular issues arise in the intersection between formal land tenure systems and customary and communally-held rights.¹⁵⁰ Schemes to reformulate land tenures and title systems to implement systems for governance of communal land and resources have been attempted at many junctures in developing countries, including those regions with extensive forested areas. Current reform efforts largely are predicated upon the ideas of individuated and formalised land titles and resource management. Such models sit alongside or displace more or less resilient customary and communal systems that have been subject to various forms of state-initiated and private, corporate intervention over many years.¹⁵¹ The interplay between indigenous peoples and local community groups, with colonial and post-colonial modes of 'intervention' in many

147 Olander et al, above n 36, 43–4.

148 Lyster, above n 13, 445.

149 Principles — Safeguards 6 in UNFCCC, *Report of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention on its Seventh Session, Held in Bangkok from 28 September to 9 October 2009, and Barcelona from 2 to 6 November*, UN Doc FCCC/AWGLCA/2009/14 (2009).

150 See generally, Lee Godden and Maureen Tehan (eds) 'Introduction', *Comparative Perspectives on Communal Lands and Individual Ownership: Sustainable Futures* (2010).

151 Daniel Fitzpatrick, "'Best Practice" Options for the Legal Recognition of Customary Tenure' (2005) 36 *Development and Change* 449; Daniel Fitzpatrick, 'Evolution and Chaos in Property Rights Systems: The Third World Tragedy of Contested Access' (2006) 115 *Yale Law Journal* 996, 999.

developing countries have produced highly conflicted land tenure regimes where existing land tenure arrangements may give no or only limited recognition for communally held rights.

Further, it is not unusual for communally held rights to be shifting and dynamic and even individual trees may be subject to a large number of different categories of use and access. Thus, considerable disquiet has been expressed as to whether 'land tenure' arrangements, where such exist, can adequately reflect indigenous and customary relationships which are sufficiently inclusive of community members. Even where communities may have access rights to forested areas often such forest 'property' or tenure rights are ambiguous and not fully codified in law.¹⁵² This will also impact on the question of whether REDD should be implemented on a project level or on a national level. The majority of forests in developing countries are held under public land tenure and thus 'owned' by the state.¹⁵³ Again a simple equation of land tenure with the rights to the financial flows at the national level may well serve to dispossess local forest communities. Indeed, the two potential main REDD partners for Australia — Indonesia and Papua New Guinea — have already been embroiled in controversy, with governments in both countries being accused of a lack of benefit sharing with local communities.¹⁵⁴

By contrast, some commentators suggest that long-term rights granted to forest communities will provide an incentive to stop logging and an influx of new settlers that inevitably leads to higher levels of land clearance.¹⁵⁵ Yet the character of the rights to be created must be carefully considered before adopting suggestions for formalisation. One suggestion here is to develop an idea of 'social tenures'. 'Social tenure' is the term used to refer to tenures that are created by social processes and norms (whether they are subsequently recognised by legal norms or not). International experience demonstrates that conversion of social tenures to individual ownership is, by itself, unlikely to be a 'solution' to systemic land management problems including deforestation and degradation and associated poverty.¹⁵⁶ By contrast though,

[t]he predominant model for [tenure design] is the western model, associated with democratic governments and highly successful nation states. These nations can afford very expensive, highly institutionalized and reliable processes that attract public support and participation.¹⁵⁷

This form of effective land tenure administration and management characterises only a small proportion of the world's developing countries. Yet many of the

152 Olander et al, above n 36, 43.

153 Andy White and Alejandra Martin, 'Who Owns the World's Forests? Forest Tenure and Public Forests in Transition' (Forest Trends, Washington DC 2002).

154 Letter from Fatimata-Binta Victoire Dah to Mr I Gusti Agung Wesaka Puja, 13 March 2009 in UN Committee for the Elimination of Racial Discrimination, 'Early Warning Measures and Urgent Procedures' Letter to the Government of Indonesia.

155 Olander et al, above n 36, 26.

156 Mario Blaser, Harvey A Feit and Glenn McRae, 'Indigenous Peoples and Development Processes: New Terrains of Struggle' in Mario Blaser, Harvey A Feit and Glenn McRae (eds), *In the Way of Development: Indigenous Peoples, Life Projects and Globalization* (2004) 1, 3.

157 Wallace, above n 104, 31.

performance assessment, monitoring and verification requirements for REDD schemes seem to suggest the need for such highly formalised tenure and land administration systems, especially to deal with features such as ‘transparency’, of the rights to the sequestered carbon by providing a means of public record.

A recent initiative which seeks to combine communal resource rights, social tenure concepts and legal recognition for customary forest dwelling communities is the *Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006* in India.¹⁵⁸ This Act recognises that traditional forest dwellers are integral to the survival and sustainability of the forest ecosystem, and that their rights on ancestral lands and the surrounding environment were not adequately acknowledged in the consolidation of State forests in earlier periods.¹⁵⁹ The legislation vests forest rights and occupation in forest land in forest dwellers that have lived in forests for generations.¹⁶⁰ This legislation would appear to be a useful model to be considered in association with the operation and implementation of REDD schemes as it is specifically targeted to forested areas and communal rights. This statutory mode of recognising forest community rights in India continues a trend whereby increasing numbers of countries are giving formal legal recognition to the relationship between indigenous peoples and their traditional ‘environments’. However optimism on this score needs to be tempered by the continued resistance to such recognition in key countries holding large forest reserves, as well as the lack of priority that can be accorded such rights even where legally recognised.

What such communal governance reforms, together with the legal recognition of customary rights, do highlight though is the central importance of effective and responsive governance to achieving the multifaceted objectives of REDD. The overwhelming opinion is that without adequate governance systems and the necessary capacity building, the implementation of REDD schemes on a large scale will not be possible.¹⁶¹ Yet the question of governance is not unproblematic in the face of the range of uncertainties that are operative around REDD. At one level governance might be related to ensuring sufficient institutional capacity to address the problems of scientific and technical uncertainties over assessment, monitoring and verification. Yet without effective intermeshing and resolution of many local, ‘on the ground’ issues of implementation REDD schemes remain a challenge for the international community, developing nations and the local forest communities.¹⁶²

158 *Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006* (India) (*Forest Rights Act 2006* (India)).

159 *Forest Rights Act 2006* (India) preamble.

160 *Forest Rights Act 2006* (India) preamble.

161 See, eg, Lorenzo Cotula and James Mayers, ‘Tenure in REDD — Start-Point or Afterthought?’ (Natural Resources Issues Paper No 15, International Institute for Environment and Development, 2009) 5; Kristy Graham and Amelia Thorpe, ‘Community-Based Monitoring, Reporting and Verification of REDD Projects: Innovative Potentials for Benefit Sharing’ (2009) 3 *Carbon and Climate Law Review* 303.

162 William Boyd et al, ‘International Forest Carbon in Current Policy Proposals’ (Policy Brief No 2, Nicholas Institute for Environmental Policy Solutions, Duke University, 2009); Olander et al, above n 36, 10.

VII CONCLUSION

As the idea of REDD gathers momentum and a modicum of international legal form in global negotiations for climate change mitigation it is important not to lose sight of the fact that such activities will ultimately need to be embedded within an effective governance and regulatory framework. Any workable governance framework must be responsive in a double-faceted manner. First, it must be outward looking to the international community and to the international law regimes of compliance that will need to operate to ensure the integrity of the market component that ascribes value to the REDD activities in developing countries. Secondly, it must be inward looking to the internal nation-state structures that will be required to effect such compliance in a manner which does not override the intricacies and sustainability of local community and customary management of forest areas.

As with many proposed environmental mechanisms that involve a complex coalescence of scientific techniques, diverse actors and a variety of legal tools, the devil of REDD implementation is likely to be in the detail. While this is not a problem specific to REDD, REDD poses numerous implementation challenges given the level of technical uncertainties, difficult issues surrounding monitoring and verification, and the complexities of integrating schemes for attaching value to carbon with other forms of land tenure. Added to this, REDD must navigate the difficult territory between international law and global governance, and domestic legal systems and land-use arrangements. This article has sought to make a contribution to ensuring the effectiveness of future REDD mechanisms by highlighting some of the major implementation questions that arise from scientific and legal perspectives, as well as possible models and systems that might offer a basis for devising workable solutions.

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