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‘COMMAND WITHOUT CONTROL’: ARE MARKET MECHANISMS CAPABLE OF DELIVERING ECOLOGICAL INTEGRITY TO REDD?

Simon West

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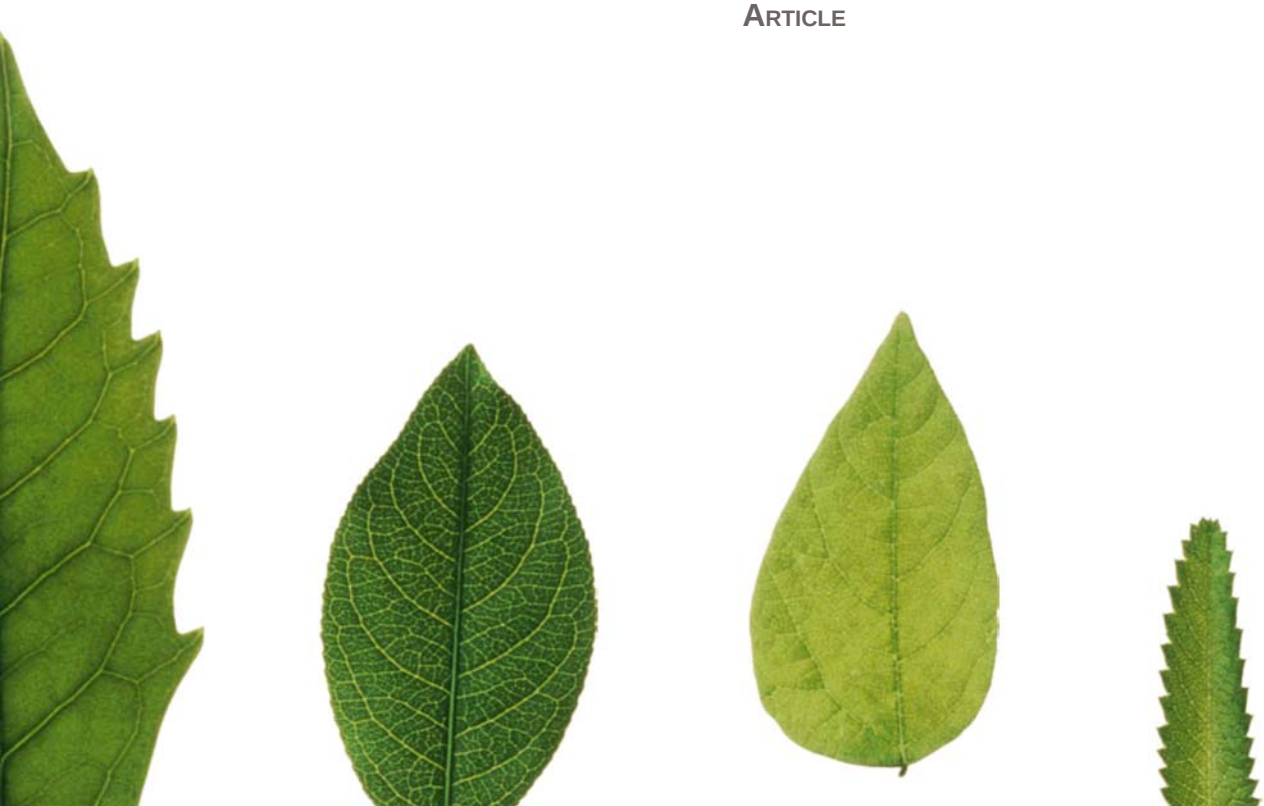

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Article

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1 INTRODUCTION

The maintenance of standing forests has the potential to mitigate vast releases of CO2 into the atmosphere. Thirty-six percent of the carbon added to the atmosphere between the years 1850 and 2000 came from deforestation, and 18 per cent of emissions in the 1990s came from deforestation and land-use change. This is second only to the energy sector in terms of global emissions.[1] Reducing emissions from deforestation and forest degradation (REDD) has therefore become a crucial element in the post-2012 climate regime.[2] As policy makers realise the challenges involved in attempting to convince a sometimes hostile public of the need to cut and transform energy use, REDD has emerged as a politically attractive potential mechanism to 'buy time' in the battle against rising global temperatures.[3] Nicholas Stern's influential report on the economics of climate change, where reducing deforestation is suggested to be the most cost-effective way of complying with IPCC endorsed targets for limiting temperature rise to two degrees Celsius, has further propelled REDD's political ascendancy.[4] A financial mechanism that provides remuneration for the maintenance of standing forests is seen as a 'win-win' situation – potentially providing a means of sustainable development for developing countries while stabilising global carbon emissions and possibly providing offset credits for developed countries. For this to happen a way needs to be found of valuing live forests more highly than dead ones, as the UK's Prince Charles has stated.[5] The linking of forestry credits to international carbon markets has been pushed as a means to do this by the majority of states, including Papua New Guinea and Costa Rica, in opposition to a multilateral fund-based approach to financing suggested by the likes of Brazil and Bolivia.[6]

The temporal restrictions imposed on policy-makers by the nature of human-induced climate change add an extra importance to the policies formed in the attempt to place such value on forests. The guiding principles of the REDD negotiations taking place in the Ad-Hoc Working Group on Long-Term Cooperative Action (AWG-LCA) include that of contributing to the objective set out in Article 2 of the UNFCCC: 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'.[7]

1 Charlotte Streck et al., 'Creating Incentives for Avoiding Further Deforestation: The Nested Approach', *in* Charlotte Streck *et al* eds., *Climate Change and Forests: Emerging Policy and Market Opportunities* 237 (London: Chatham House, 2008) and Johan Eliasch *et al.*, *Eliasch Review. Climate Change: Financing Global Forests,* (London: UK Office of Climate Change, Executive Summary, 2008).

2 The momentum for inclusion of REDD mechanism in post-2012 regime was initiated by Papua New Guinea and Costa Rica's submission to COP 11 in Montreal (Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action, FCCC/CP/2005/MISC.1, 11 Nov 2005), was further propelled by Decision 2/CP.13 in Bali (Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action, *in* Report of the Conference of the Parties on its thirteenth session, Bali, 3 - 15 December 2007, Doc. No. FCCC/CP/2007/6/Add.1, 14 March 2008) mandating the creation of a pilot programme of activities, and culminated in the Copenhagen Accord commitment to immediately establish a REDD mechanism with new and sustainable funds (Copenhagen Accord, Decision 2/CP.15, *in* Report of the Conference of the Parties on its fifteenth session, Copenhagen, 7 - 19 December 2009,Doc. No. FCCC/CP/2009/11/Add.1, 30 March 2010).

3 FAO, UNDP and UNEP, UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries: Framework Document, 20 June 2008. The document states that cost-efficient emission reductions achieved through REDD could 'effectively buy much needed time for countries to move to lower emissions technologies' (1).

4 Nicholas Stern, *Stern Review on the Economics of Climate Change* (London: HM Treasury, 2006) and Rajendra Pachauri and Andy Reisinger eds., *Climate Change 2007: Synthesis Report-Contributions of Working Groups I, II, and III to the Fourth Report of the Intergovernmental Panel on Climate Change* (Geneva: IPCC, 2007).

5 John Vidal, 'Prince of Wales Warns Copenhagen that Planet is in Crisis', *The Guardian*, 15 December 2009, available at www.guardian.co.uk/environment/2009/dec/15/copenhagen-redd-deforestation.

6 Covington & Burling LLP and Baker & McKenzie, Background Analysis of REDD Regulatory Frameworks, 17 May 2009, available at www.terrestrialcarbon.org/site/DefaultSite/filesystem/documents/TCG-2009-Background-Analysis-of-REDD-Regulatory-Frameworks.pdf.

7 Negotiating Text, Ad Hoc Working Group on Long-term Cooperative Action under the Convention, Sixth Session, Bonn, 1-12 June 2009, Doc No. FCCC/AWGLCA/2009/8 (2009) and United Nations Framework Convention on Climate Change (UNFCCC), New York, 1992, Doc No. FCCC/INFORMAL/84, Article 2.

The REDD negotiating text pre-Copenhagen contained proposed targets of reducing emissions from deforestation by 50 per cent in 2020.[8] If REDD is to be a useful mechanism in helping to fulfil the objective of Article 2 it will have to instigate dauntingly immediate emissions reductions. It is accepted in scientific and political discourse that a restriction in temperature rise to two degrees is an adequate stabilisation level.[9] The IPCC's Fourth Assessment Report concludes that in order to achieve such a level global emissions must peak by 2015.[10] Although this is widely considered to now be impossible, the potential for higher emissions increases to affect catastrophic economic and social changes mean that policy-makers interests remain to achieve such a peak as soon as possible. The IPCC conservatively estimates that a peak by 2030 would limit temperature rise to three degrees.[11] The failure of parties to produce a legally binding agreement at Copenhagen means that achieving a peak in emissions appears ever further on the horizon, and the likelihood of a market-linked REDD producing significant emissions reductions in the timescale required appears much reduced. Indeed, Yemi Katerere, head of the UN-REDD secretariat, has stated that due to the lack of enabling frameworks, the private sector has failed to position itself on REDD and consequently there would be a gap of several years before projects began producing emissions reductions even after any such legislation passed.[12]

This paper will examine REDD's trajectory within the climate regime, before analysing the importance of REDD within the wider critical debate regarding the efficacy of market-led environmental protection schemes, and finally drawing lessons from the practice of such schemes in 'the real world'. This paper will argue that the claims for quick and cost efficient emissions reductions made for a market-linked REDD by Nicholas Stern, Johan Eliasch, and others, which gave initial impetus to REDD within the climate regime, have largely been undermined by several years of close academic scrutiny and political dithering. Nevertheless, REDD has gained political momentum, rather because of its ability to provide a rare consensus between developed and developing countries by promising to bridge the gulf in financial resources available to fight climate change (and perhaps in doing so distracting developed countries from domestic obligations), than because of any ability to quickly reduce emissions. The REDD programme, envisaged as market-led, has subsumed long-standing, perhaps intractable, development policy concerns within its remit in the attempt to create favourable market conditions in infrastructure and governance-poor countries - to the point of requiring almost complete structural change across swathes of the developing world for its success. That this should be so points to the sheer volume of externalities involved in preventing deforestation, to the symptomatic nature of deforestation, and to the limits of mechanism-driven policy development. For the climate regime it suggests that a market-linked REDD programme is unsuitable as a 'quick fix' and warns against excessive reliance on such a scheme in preventing temperature rise above two degrees. These are important lessons to learn as the negotiations for a post-2012 regime enter a critical stage.

2 THE DEVELOPMENT OF FORESTRY PROGRAMMES IN THE CLIMATE REGIME

2.1 Forestry and the Clean Development Mechanism (CDM)

Forestry has long been a contested subject in the climate regime. The UNFCCC requires signatories to maintain/encourage development of carbon 'sinks', but the first attempt to include an operational mechanism to that effect was made during the negotiations for the creation of the Clean Development Mechanism (CDM) in

8 Annex 3(C), *in* Report of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, Seventh Session, Bangkok, 28 Sept – 9 Oct 2009, and Barcelona, 2 – 6 Nov 2009, Doc No. FCCC/AWGLCA/2009/14 (2009).

9 *See* Copenhagen Accord, note 2 above, Article 1.

10 *See* Pachauri and Reisinger, note 4 above at 67, Table 5.1.

11 *Id.*

12 As quoted in US Climate Legislation and REDD+: Progress and Complications, 2010, available at http://www.asb.cgiar.org/index.php?q=content/us-climate-legislation-and-redd-progress-and-complications.

Kyoto.[13] The potential of financial incentives for afforestation and reforestation (A/R) and avoided deforestation (AD) to combat rises in carbon emissions was clear, but just as clear was the potential of corruption and methodological weaknesses to undermine ecological validity.[14] The outcome was a compromise that limited forestry activities allowed under the CDM to A/R but omitted AD. The stringent criteria for acceptance of A/R activities under the CDM, enforced in order to avoid leakage and ensure permanence and additionality, have ensured that only a tiny number of forestry projects have been accepted.[15]

2.2 The Development of the Reduced Emissions from Deforestation and Forest Degradation (REDD) Programme

Since Kyoto, increased scientific awareness about the scale of emissions from land-use change and improvement of monitoring methods has led to a groundswell of support for an inclusive new mechanism which includes AD and A/R activities. This support has arguably been also encouraged by the stalemate experienced in other areas of the climate regime, notably the agreement of a successor to Kyoto, and by the ideas floating amongst developed country parties that they may be able to 'offset' a significant proportion of their emissions by purchasing REDD credits (thus reducing the need for more expensive and politically controversial domestically oriented measures), and amongst developing country parties that REDD may become a significant new source of aid.[16]

REDD within the climate regime developed from proposal by Papua New Guinea (PNG) and Costa Rica at COP 11 in 2005, and received a mandate at COP 13 in 2007 under the Bali Action Plan through SBSTA and the AWG-LCA.[17] Pilot programmes under UN-REDD and the World Bank's Forest Carbon Partnership Facility (FCPF) were instituted with a view to providing 'learning by doing', and feeding such experience into negotiations to produce a consensus framework agreement at the Copenhagen summit in December 2009.

2.3 REDD at Copenhagen

Copenhagen proved a disappointment to proponents of REDD as rather than producing a detailed legal framework, it produced the Copenhagen Accord ('the Accord') - a 'political-diplomatic' document with limited agreement on details of REDD financing and methodologies.[18] On finance the REDD negotiating document contained bracketed text suggesting a 'flexible

13 *See* UNFCCC, note 7 above. Commitments listed under Article 4 include commitments to formulate and implement measures to mitigate climate change through 'removals by sinks' (1b) and to 'reduce or prevent anthropogenic emissions ... in all relevant sectors, including ... agriculture [and] forestry' (1c).

14 *See* Erin C. Myers, 'Climate Change and Forestry: A REDD Primer', *Ecosystem Marketplace*, 19 May 2008, available at http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=5797&section=home.

15 According to the CDM website, only 0.57 per cent of all approved CDM projects have been afforestation or reforestation activities. Figures available at http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html.

16 For instance from the developed country perspective several draft U.S. cap-and-trade bills have envisaged purchasing of REDD credits on a large scale to lessen the financial impact on U.S. industry, notably the Lieberman-Warner Climate Security Act, 2007, S. 2191. The recently inaugurated California cap-and-trade scheme (AB32) also provides for mass-purchasing of REDD credits. From developing countries' point of view, *see* Ecuador's plea for funding to maintain its Yasuni rainforest: Hugh Bronstein, 'Factbox: Ecuador's Yasuni Jungle Protection Plan', *Reuters*, 14 Sept 2010, available at http://www.reuters.com/article/idUSTRE68E0A620100915 and Norway's deals with Brazil and Indonesia: Anonymous, 'Better REDD than Dead: Tropical Forests' Best Hope', *The Economist,* 23 Sept 2010, available at http://www.economist.com/node/17062737?story_id=17062737&fsrc=rss.

17 Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action, Item 6 of the provisional agenda, Conference of the Parties, Eleventh Session, Montreal, 28 Nov – 9 Dec 2005, Doc No. FCCC/CP/2005/MISC.1. (2005) and Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action, Decision 2/CP.13, Report of the Conference of the Parties, Thirteenth Session, Bali, 3-15 December 2007, Doc No. FCCC/CP/2007/6/Add.1 (2008).

18 Feja Lesniewska, 'REDD: The Copenhagen Effect', 6/1 *Law, Environment and Development Journal* 102, 105 (2010), available at http://www.lead-journal.org/content/10102.pdf.

combination of funds and market based sources'[19] throughout the conference, finally being ditched in favour of a general confirmation in the Accord that 'opportunities to use markets' would be utilised to 'enhance the cost-effectiveness of, and to promote mitigation actions'.[20] A 'REDD mechanism' partly funded by the Copenhagen Green Climate Fund was mandated, with a 'collective commitment' to 'provide new and additional resources, including forestry ... approaching USD 30 billion for the period 2010-2012', and a commitment from developed countries to mobilise jointly '100 billion dollars a year by 2020 to address the needs of developing countries'.[21] However, despite such notional commitments, the language on REDD in the Accord was significantly more vague and imprecise than the text in the negotiating paper the parties began the conference with – the Accord contains no details of what form a REDD mechanism will take. In terms of progress on methodologies, SBSTA was given a mandate to continue its work on REDD throughout 2010 as many uncertainties remain – however few concrete decisions have been made so far this year other than encouraging further work and information-sharing.[22] In lieu of a legally binding and detailed document, ongoing negotiations on REDD are taking place within the AWG-LCA.[23] Pilot activities and continuing discussions on finance and methodologies are being discussed and/or funded through the UN-REDD programme, the FCPF, and the recently inaugurated REDD+ Partnership.[24]

2.4 Beyond Copenhagen

The Copenhagen Accord can be seen as an affirmation of political support for REDD but also as indicative of confusion over policy detail and methodologies. The idea that REDD activities will at first rely on multilateral fund-based finance and a scattering of privately financed project level initiatives before eventually linking up with global carbon markets and providing tradable credits appears to be the mainstream belief among parties.[25] This belief is based on the conviction that a market-based system will provide a sustainable stream of revenue for REDD activities (removing funding from the political whims of conventional aid streams), greater sums of capital, greater investment, more flexibility for private interests, and consequently more ecological success. However this conviction is tempered by the failed forestry CDM, continued difficulty in distribution and implementation of effective measurement, reporting and verification (MRV) techniques, emerging stories of large scale corruption and coercion of local communities by investment funds attempting to jump on the REDD 'bandwagon' early, and the lack of successful role models in market-linked schemes for environmental protection. There is a tension between ideologically attractive but ecologically riskier market mechanisms (that promise a revolution in environmental protection) and ideologically unattractive but relatively proven command-and-control legislation (that promise modest, likely expensive, environmental gains). Therefore the compromise appears to be encouraging sporadic privately funded project-level activity while also funnelling pledged funds through various channels (UN-REDD, FCPF, FIP) to

19 Policy Approaches and Positive Incentives on Issues Relating to Reducing Emissions from Deforestation and Forest Degradation in Developing Countries; and the Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries, Draft Decision -/CP.15, Copenhagen, 7 - 18 Dec 2009, Doc No. FCCC/AWGLCA/2009/L.7/Add.6 (2009), Article 11.

20 *See* Copenhagen Accord, note 9 above, Article 7.

21 *Id,* Article 8.

22 Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action, Draft conclusions proposed by the Chair, Subsidiary Body for Scientific and Technological Advice, Bonn, 31 May – 9 June 2010, Doc No. FCCC/SBSTA/2010/L.2 (2010).

23 Outcome of the Work of the Ad-Hoc Working Group on Long-Term Cooperative Action Under the Convention, Decision 1/CP.15, *in* Report of the Conference of the Parties, Fifteenth Session, Copenhagen 7- 19 Dec 2009, Doc No. FCCC/CP/2009/11/Add.1 (2010).

24 The REDD+ Partnership is an initiative headed by Norway, to gather donors and REDD countries together with the aim of scaling up financing and pilot activities and helping to form a REDD+ mechanism under the UNFCCC. Whilst not working under the UNFCCC, the partnership aims to support negotiations in the AWG-LCA. *See*: REDD+ Partnership, Adopted at the Oslo Climate and Forest Conference, Oslo, 27 May 2010, available at http://www.oslocfc2010.no/pop.cfm?FuseAction=Doc&pAction=View&pDocumentId=25017.

25 Louis V. Verchot and Elena Petkova, *The State of REDD Negotiations: Consensus Points, Options for Moving Forward and Research Needs to Support the Process* 2 (Bogor, Indonesia: Center for International Forestry Research, 2009).

reduce the risk of a whole host of externalities which threaten the ecological validity of a market mechanism, in theory paving the way for a fully developed national-level market system in the next 10 – 15 years.[26] To this end the Oslo Climate and Forest Conference in May 2010 announced that four billion USD, pledged by donor countries, would be available for 'fast-start' actions over the next two years.[27]

2.5 Conflicting Visions for REDD Within the Climate Regime

The increasingly sprawling nature of REDD and the diversity of parties included in negotiations has led to huge variation in visions for the programme, and consequent disparities in motivation. For rapidly developing countries such as Brazil and Indonesia, deforestation represents a vast proportion of overall emissions and the implementation of REDD programs could be influential if, as expected, developing country mitigation commitments are included for the first time in the post 2012 climate change regime.[28] The degree to which REDD projects can be counted as nationally appropriate mitigation actions (NAMAs) will highly influence such countries' negotiating position.[29] REDD could, in theory, engage major developing countries in a schedule of mitigation targets and provide a less politically fraught route of accession of such states to 'Annex I status'. By leveraging financial flows from the developed world to the developing world in a way acceptable to both, REDD promises to bridge the North-South equity arguments that have dogged recent negotiations. However, a REDD mechanism linked to the offset markets could also result in a situation where forests are preserved in developing countries merely as offsets for developed countries whilst not resulting in any actual decrease of global emissions and actually undermining existing mitigation targets.

For least developed countries (LDCs) such as the Congo, Papua New Guinea (PNG), and Gabon, REDD programs promise a means of attracting foreign investment and could in theory help mitigate a host of problems affecting rural communities (including food insecurity, poor healthcare, and unemployment).[30] However, this is REDD's promise and its curse – the countries in which REDD activities are most desired are often countries which have previously proved impervious to development assistance and foreign investment. Many rate extremely low on governance indicators and suffer rampant corruption.[31] This instability is a significant challenge to the ecological integrity of any future REDD programme. It also provides an uncertain climate ill-suited to private investment and market approaches.

It is widely acknowledged that for REDD to provide truly global public goods, a national system of accounting is required. In a market-scheme where emissions reductions are traded, uniform methods of identifying baselines, assembling carbon inventories, and ensuring validity of credits are required. However, the complexity and variability of developing countries' standards of governance and infrastructure belies the quick implementation of such a global scheme. Engaging in such a large scale with development issues in order to create favourable market conditions for REDD threatens to thrust the climate regime into new political and legal territory.

These development issues present themselves to a future REDD market as externalities, and derive from the socio-economic and political context of forests and the

26 *Id.,* at 10 – 16.

27 Co-chairs' Summary, Oslo Climate and Forest Conference, Oslo, 27 May 2010, available at http://www.oslocfc2010.no/pop.cfm?FuseAction=Doc&pAction=View&pDocumentId=25018.

28 Reports have suggested that in the 1990s as much as 75 per cent of Brazil's carbon emissions were due to deforestation. That proportion has decreased as Brazil has industrialised. *See* Mario Osava, 'Brazil: Deforestation Down 45 Percent', *IPS*, 13 Nov 2009, available at http://ipsnews.net/news.asp?idnews=49257.

29 *See* Negotiating text, AWG-LCA, note 7 above at 19 – 40.

30 Tom Griffiths, 'Seeing 'RED'?: 'Avoided Deforestation' and the Rights of Indigenous Peoples and Local Communities (Moreton-in-Marsh: Forest Peoples Programme, 2007), 7. Griffiths points out that the DRC could feasibly gain US$2.7 - $33 billion a year from AD payments. For an example of developing countries' enthusiasm for such schemes, *see* Ecuador's request for money to not drill for oil in the Amazon and to compensate opportunity costs: Rory Carroll, '$350 Million to Leave Oil in the Ground', *Guardian*, 31st Aug 2007, available at http://www.guardian.co.uk/environment/2007/aug/31/1.

31 Daniel A. Kaufmann, Aart Kray and Massimo Mastruzzi, Governance Matters VIII: Governance Indicators for 1996 – 2008*,* World Bank Policy Research Working Paper No. 4978, 29 June 2009. Countries receiving REDD funding such as the Democratic Republic of Congo, Indonesia, Papua New Guinea and Liberia record some of the lowest worldwide scores in World Bank governance indicators.

land on which they stand. There is, then, a general consensus in UN negotiations that REDD schemes will have to address more than just the issue of carbon sequestration to be successful on both operational and equitable grounds.[32] The rights of local and indigenous people and the protection of biodiversity have become key areas of debate within the UN-REDD programme and the FCPF, leading to the development of the concept of 'REDD+' schemes which include additional commitments to sustainable development and biodiversity targets. The involvement of local people in monitoring forest cover, the alignment of REDD objectives with local development objectives, and the necessity of whole-of-government responses including land tenure reform have become recognised as crucial to the ecological and financial success of REDD.[33] There is disagreement from country to country regarding the extent to which market-based or fund-based approaches would be able to engage local stakeholders and provide these extra public goods.

The synchronised achievement of carbon sequestration, job creation, biodiversity protection, and land rights recognition would be a labyrinthine political and economic task perhaps unsuited to an originally modest proposal focusing on the carbon value of natural vegetation. As research on REDD has progressed, it has become increasingly clear that Stern's claim for the simplicity and cost-effectiveness of preventing deforestation may have been overcooked. As Streck et al. write, 'deforestation is a symptom of a multicausal disease for which a proven cure does not yet exist'.[34] Drivers of deforestation include trade law and policy, individual consumption, farming subsidies – even the climate regime itself with its promotion of biofuel production.[35] The REDD programme has been criticised for being overly 'mechanism driven'. For instance David Brown and Neil Bird write that: 'policy development is problematic in arenas that are excessively 'mechanism driven'. The approach needs to be turned on its head, and the mechanism subordinated to the problems it is trying to address'.[36] To no process is this more applicable than to REDD, where the unsolvable development problems of a generation are subordinated to a mechanism initially designed to protect more trees.

3 MARKET-LINKED SCHEMES FOR ENVIRONMENTAL PROTECTION IN ACADEMIC DISCOURSE

To understand the basis of such a process, REDD needs to be placed in the context of a wider intellectual debate about the relative ability of public and private finance to prevent environmental degradation. There is an increasing conviction among environmental economists that climate change is 'one of the largest market failures in the history of mankind' - that climate change is nature's critique of capitalism.[37] Indeed, it has even been suggested that an effective REDD scheme would have

32 *See* Verchot and Petkova, note 25 above, at 11.

33 For example, Costa Rica's presentation to the UNFCCC REDD workshop in Tokyo, 25 – 27 June 2008, 'Methodologies for REDD: Lessons from Costa Rica', claims that success in reducing deforestation depends on nationwide sustainable development policies, the addressing of drivers, and the creation of alternative industries for local populations; 'REDD and the EU: Experiences and Challenges from Demonstration Activities' – a presentation given at the same UN REDD workshop by Denis Loyer – also trumpets the benefits of involving communities in MRV and assembling inventories using a case study of a project in French Guiana.

34 *See* Streck et al., note 1 above.

35 FAO, UNDP and UNEP, UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries: Framework Document, 20 June 2008. The document describes the various drivers of deforestation across the world, concluding that the causes vary from country to country and are 'very complex in nature … As a result, solutions need to be tailor-made to the environmental and socio-economic conditions of each country and their institutional capacity' (2).

36 David Brown and Neil Bird, 'The REDD Road to Copenhagen: Readiness for What'? *ODI Opinion,* 118, 2008, available at http://www.odi.org.uk/resources/download/2584.pdf.

37 Johnannes Ebeling, 'Risks and Criticisms of Forestry-Based Climate Change Mitigation and Carbon Trading', *in* Streck et al. eds., note 1 above at 43, 53 and Stern, note 4 above, at 25. Stern writes: 'Markets do not automatically provide the right type of and quantity of public goods, because in the absence of public policy there are limited or no returns to private investors for doing so … Thus climate change is an example of market failure involving externalities and public goods.'

to address, in reality, the basis of an economic system predicated on the assumption that economic progress means increased production and consumption (and the deforestation which results).[38] That a process such as REDD, which begins as a mechanism to protect forests, can only be seen to work by challenging or transforming whole sections of development dogma, suggests that capitalism as it stands is intractably antagonistic to the natural world. However, many of the academics advancing such theories proceed to suggest that the remedy to this failure is increased market influence on environmental policy and protection in the form of ecosystem service approaches and carbon trading schemes.[39] This apparent contradiction whereby markets are seen as the cause of the crisis but also as the remedy speaks to a historical moment of profound policy confusion.[40] REDD, through five years of debate, has absorbed various and perhaps contradictory notions into its design.[41]

The crux of these contradictions is to what extent REDD regulatory frameworks can rely on the private sector to provide and conserve public environmental goods. Some academics see the market system as antithetical to the preservation of such goods, as inevitably public goods do not translate into private profit. They see the development of environmental law and command-and-control regulation as the methods by which environmental concerns are imposed on markets.[42]

However, an equally strong, perhaps now dominant strain of thought sees involvement of markets as crucial to environmental protection, emphasising the need for the economic value of nature to be recognised and consequently valued.[43] This strain of thought emphasises the disconnect between the structures of private and public (or open-access) ownership systems and claims it is this disparity which fuels environmental degradation. The reason for market failure resulting in environmental degradation, in this view, is that the market system is incomplete – extending it to the natural world would rectify the problem. A major UN study titled 'The Economics of Ecosystems and Biodiversity' (TEEB), due to be published this year, attempts to transfer this concept, described as payment for ecosystem services (PES), into the public realm.[44] PES schemes (of which REDD is effectively one) would, in theory, provide similar ecological benefits to those provided by command-and-control at far less economic cost by passing the costs of preserving ecosystem services (for REDD, the carbon sequestration provided by forests) onto those who value them most, usually local communities (but in the case of carbon sequestration also national governments and carbon-intensive industries).[45] However, the structures necessary for such schemes to work, including advanced measurement, reporting and verification (MRV) of natural processes, defined property rights, a strong civil society and participatory democratic rights, do not currently exist in many developing countries interested in REDD.

38 *See* Jayati Ghosh, 'Beyond Ecological Imperialism', *Guardian*, 21 December 2009, available at http://www.guardian.co.uk/commentisfree/cif-green/2009/dec/21/economic-imperialism-climate-change and Herman E. Daly, 'The Economic Growth Debate: What Some Economists Have Learned but Many Have Not' *in* Anil Markandya and Julie Richardson eds., *Environmental Economics* 36 (London: Earthscan, 1992).

39 James N. Sanchirico and Juha Siikamaki, 'Natural Resource Economics and Policy in the 21st Century: Conservation of Ecosystem Services', 165 *Resources* 8 (2007).

40 Marked in economic terms by the crisis of capitalism caused by the global credit crunch and consequent recession, and in environmental terms by the entrance of the U.S. into climate negotiations and the rising negotiating power of China.

41 REDD proposals began life as part of the negotiations regarding the CDM almost exclusively based on tree-cover and carbon sequestration – they have now incorporated ideas including World Bank funds for policy change in host countries, economic policy alteration to address deforestation drivers, involvement of local people, etc.

42 Stephen M. Johnson, 'Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice'? 56 *Wash & Lee L. Rev* 111, 114 (1999).

43 *See* Rudolf de Groot, 'Integrating the Ecological and Economic Dimensions in Biodiversity and Ecosystem Service Valuation', *The Economics of Ecosystems and Biodiversity: The Ecological and Economic Foundations*, March 2010 at 4, available at http://www.teebweb.org/EcologicalandEconomicFoundation/tabid/1018/Default.aspx.

44 Pawan Sukhdev et al., The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB, 2010, available at http://www.teebweb.org/LinkClick.aspx?fileticket=bYhDohL_TuM%3D&tabid=924&mid=1813

45 *See* Sanchirico and Siikamaki, note 39 above; There are many small to medium scale ecosystem services projects up and running. For a summary, *see* The Cartegena Workshop on WWF payment for environmental experiences and projects, 13 March 2007, available at http://www.panda.org/what_we_do/how_we_work/policy/development_poverty/macro_economics/?uNeuNew=96600.

The academic basis for market-linked schemes for environmental protection tends to reside in theory-based models rather than 'on-the-ground' realities.[46] Daniel Cole and Peter Grossman describe how a perfect situation would look in such a model: property rights would be perfectly specified, all environmental goods would be parcelised and allotted to individual owners who would have full means to use, exclude and trade in a stable legal system, benefit and cost functions would be fully known and a social welfare function would be specified and authorities would maximise its net dollar value, information costs would be low and bargaining essentially costless.[47] If this situation existed in reality, market approaches would indeed be more ecologically and economically successful than command-and-control. However this is rarely, if ever, the case. In REDD countries, property rights are unclear, especially with regard to public goods, information is often unavailable, and governments face pressure to avoid maximising social welfare functions. For a market system to work efficiently for the environment in real-life a sufficient number of these factors would need to at first be recognised, and then be at least incrementally edged towards a more favourable scenario. Government has been proposed as ideally positioned to play this role. As Joseph Stiglitz has pointed out, without strong and reliable governance structures, markets often work against the poorest and least powerful members of developing country societies.[48] This is particularly pertinent with regard to REDD as those stakeholders most reliant on forests and the land on which they stand are often the most financially and politically vulnerable. However the costs of achieving suitable market conditions in such unstable environments appear almost inestimable and the cost-benefits ratio could shift dramatically due to any number of externalities.

Consequently the establishment of a REDD market system is a significant risk. The IPCC states that in order to keep temperature rise below two degrees, emissions must peak by 2015.[49] The REDD+ Partnership document adopted by parties at the Oslo Climate and Forest conference explicitly describes REDD as an important scheme to prevent temperatures rising more than two degrees.[50] Although a peak by 2015 is now all but impossible, time remains of the essence in reducing carbon emissions to prevent dangerous climatic change. As we shall see below, command-and-control policies such as those implemented in Brazil, Costa Rica, and the United States, have helped make modest environmental gains, and a complete long-term rejection of them would be a rejection based on ideological rather than practical grounds.[51] The establishment of a market-scheme will require significant long-term investment and management of an infinitely complex set of externalities, in which time command-and-control legislation could potentially have been providing continuous ecological benefits.

Various experiences of market mechanisms designed to produce environmental benefits, whether through cap-and-trade or baseline-and-credit type schemes, will be discussed below. The lessons we learn from such experiences are that even in developed countries with highly developed technology and scientific knowhow, functioning democracies with low corruption levels, strong civil societies, clearly defined property rights and complex and developed financial markets, the process of instituting ecologically effective market mechanisms is exceedingly unpredictable, expensive, and often unsuccessful. We also learn through experiences with early REDD pilot schemes that such processes are being repeated in developing countries, with similar outcomes. A market-linked REDD scheme (with a strong command-and-control 'safety net') could potentially provide huge environmental benefit in the future. However the increased importance that REDD has been given within the climate regime is inchoate with the timescales of emission reductions required and the costs of wholesale structural change needed in REDD

46 Kati Kulovesi, 'The Private Sector and the Implementation of the Kyoto Protocol: Experiences, Challenges and Prospects', 16 *RECIEL* 145, 157 (2007).

47 Daniel H. Cole and Peter Z. Grossman, 'When is Command-and-Control Efficient? Institutions, Technology and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection', 1999 *Wis. L. Rev.* 887, 892 (1999).

48 Joseph E. Stiglitz, *Globalization and its Discontents* 30 (London: Penguin, 2002).

49 Richard Ingham, 'Carbon Emissions Must Peak by 2015: UN Climate Scientist', *AFP*, 15 Oct 2009, available at www.google.com/hostednews/afp/article/ALeqM5izYrubhpeFvOKCRrZmWSYWCkPoRg.

50 *See REDD+* Partnership Document, 27 May 2010, available at http://www.oslocfc2010.no/pop.cfm?FuseAction=Doc&pAction=View&pDocumentId=25017.

51 Marco Sibaja, 'Brazil: Deforestation Sees Biggest Drop in 20 Years', *APW*, 12 Nov 2009, available at http://www.physorg.com/news177271650.html.

countries in order for successful outcomes. The overriding conclusion of this paper is that a focus on creating suitable conditions for an international market-linked REDD programme is proving a costly distraction to a climate regime that needs to make immediate and potentially politically unpalatable decisions regarding energy production and consumption levels in the developed world if UNFCCC emissions reductions targets are to be met. The focus on REDD is a symbol of the intractability of these issues.

4 MARKET-LINKED SCHEMES FOR ENVIRONMENTAL PROTECTION IN 'THE REAL WORLD'

4.1 Problems with Measurement, Reporting and Verification (MRV)

The U.S. cap-and-trade scheme aimed at reducing industrial sulphur dioxide emissions is often touted as evidence that markets can work effectively for the environment.[52] Sulphur dioxide emissions are indeed on track to be reduced ahead of schedule at high cost efficiency.[53] However, this success would likely have never been achieved had it not been for the acquisition of 20 years experience in MRV through the much maligned command-and-control Clean Air Act of 1970 ('the Act'). U.S. commentators, arguing for greater use of market mechanisms within environmental policy, have criticised the Act in three main ways. Firstly they claim that it has placed prohibitive costs on industry by not discriminating between those able to cut pollution more cost-effectively and those unable to do this efficiently, secondly that the Act provides no incentive to innovate, and thirdly that it apparently discourages economic growth by heavily regulating new industry.[54] It has also been pointed out that the Act has failed to meet its own pollution targets.[55] Taken at face value, these criticisms may hold some validity – however they completely ignore the context (or 'the real world') in which the Act has operated. In 1970 MRV techniques were so ineffective that a cap-and-trade scheme would have been an ecological failure - as there would have been no way of monitoring what, exactly, was being traded. As David Driesen writes: 'almost every expert in the field has cautioned that trading only works well when we can monitor the emission reductions or other environmental good being traded'.[56] By focusing on new industry, the U.S. government could address known causes of pollution in the production stage, and therefore be assured of making some concrete impact on pollution levels.[57] Indeed, although the Act has not reached its own ambitious targets, the EPA has estimated that it has still made pollution reductions worth up to $28.2 trillion.[58]

A similar story has been emerging in Brazil over the last decade, where government investment in research and development (improving MRV), coupled with command-and-control policies which have reformed land registry processes and increased law enforcement, are resulting in reduced deforestation rates and accruement of technological know-how.[59] These measures take time but are necessary for the creation of effective market conditions. When abatement costs are low and monitoring costs are high, command-and-control legislation is likely to be much more efficient than cap-and-trade.[60] With a market scheme in place in this situation, marginal costs would be high while environmental benefits would be low.

Despite advances in forestry MRV capabilities in a limited number of states (notably Brazil and India), the disbursement of forest carbon monitoring techniques among REDD countries remains severely stunted, and monitoring costs would currently be too high to allow the ecologically and economically effective functioning

52 U.S. Clean Air Act Amendments of 1990, S. 1630.

53 *See* Cole and Grossman, note 47 above at 906 and Tom Tietenberg, 'Tradable Permits in Principle and Practice', 14 *Penn St. Envtl. L. Rev.* 251, 254 (2006).

54 *See* Johnson, note 42 above at 160.

55 *See* Cole and Grossman, note 47 above at 898 – 899.

56 David Driesen, 'Trading and its Limits', 14 *Penn St. Envtl. L. Rev.* 169, 171 (2006).

57 *See* Cole and Grossman, note 47 above at 902.

58 *Id,* at 901 – 902.

59 James Astill, 'Less Smoke, Less Ire', *in* 'Seeing the Wood: A Special Report on Forests', 396/8701*The Economist* 25 Sept 2010, p. 14.

60 *See* Cole and Grossman, note 47 above, at 901 – 902.

of a market mechanism.[61] There have been some MRV successes in REDD pilot projects, including satellite techniques and smaller-scale methods involving forest communities, and 'start-up' funds are beginning to flow into potential REDD countries such as Gabon, Congo, Costa Rica, and PNG to assist in forest monitoring.[62] SBSTA received a mandate at Copenhagen to continue working on monitoring methodologies – which is essential to the ecological validity of REDD, but which also shows the lengthy timescales involved in creating a suitable market environment for the programme.[63]

To achieve ecological validity a future REDD market mechanism would have to be predicated on the achievement of the most effective MRV as defined by the IPCC good practice guidance, which appears to be many years away.[64] The scale of the challenge is illustrated by an assessment of forest monitoring capabilities in non-Annex 1 countries conducted by GOFC-GOLD which found that less that 20 per cent of countries surveyed had submitted a complete GHG inventory (as of July 2009), and only 3 of 99 countries had capacity considered 'very good' for forest area change monitoring and forest inventories.[65] These deficiencies are largely the fault of common development issues – a lack of government capacity and competence, a lack of technology and the know-how to operate it, a lack of skilled staff, and a lack of access due to poor infrastructure or conflict.[66] For instance the GOFC-GOLD survey found that the Democratic Republic of Congo (DRC, a REDD country) was severely deficient in technical equipment for data processing, in internet connectivity for data access, in receiving stations for satellite imagery, and in staff capacity for both technological approaches and fieldwork.[67] The simultaneous improvement of capacity across such a large swathe of the developing world (over 50 countries are currently participating in REDD but this is expected to grow) would be daunting to even the most optimistic development worker.[68]

Market schemes, either cap-and-trade or baseline-and-credit, rely on the construction of a set level of 'safe' emissions – allocations to which can then be distributed or extra reductions credited. If MRV is weak, there is increased potential for corruption here, as well as politically rather than scientifically defined baselines. In 2005, due to MRV failures and lobbying pressure, the

61 Randall S. Abate and Todd A. Wright, 'A Green Solution to Climate Change: The Hybrid Approach to Crediting Reductions in Tropical Deforestation', 20 *Duke Envtl. L. & Pol'y F.* 87, 118 (2010). Abate and Wright note that the technology exists to adequately monitor deforestation – however there is a capacity gulf to be bridged before that technology is dispersed to an extent which would allow an ecologically effective market mechanism to be implemented.

62 'Quick Start Actions and Establishment of the Multi-Donor Trust Fund for the UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD) in Developing Countries', UN-REDD, 14 May 2008. This document sets out the basic activities to be funded in quick-start actions, including 'building capacity', 'testing a range of actions relevant to the REDD negotiations', and 'paving the way for long-term engagement of REDD into the carbon market through payment for ecosystem services' (p. 2). Lists of participants in REDD schemes can be found at the UN-REDD web platform at http://www.un-redd.org/AboutUNREDDProgramme/NationalProgrammes/tabid/584/Default.aspx, and the FCPF website at http://www.forestcarbonpartnership.org/fcp/node/283.

63 Florence Daviet, 'From Copenhagen to Cancun: Forests and REDD', *World Resources Institute*, 17 May 2010, available at http://www.wri.org/stories/2010/05/copenhagen-cancun-forests-and-redd.

64 Jim Penman et al. eds., *IPCC: Good Practice Guidance for Land Use, Land-use Change and Forestry*, (Kanagawa, Japan: Institute for Global Environmental Strategies (IGES) for the IPCC, 2003) *and* Clare Breidenich and Daniel Bodansky, Measurement, Reporting and Verification in a Post-2012 Climate Agreement, *Pew Center on Global Climate Change,* April 2009 at 16 – 17, available at http://www.pewclimate.org/docUploads/mrv-report.pdf.

65 Martin Herold, 'An Assessment of National Forest Monitoring Capabilities in Tropical Non-Annex I Countries: Recommendations for Capacity Building', GOFC-GOLD Land Cover Project Office and Friedrich Schiller University Jena, for the Prince's Rainforest Project and the Government of Norway, 8 July 2009 at 2, available at http://princes.3cdn.net/8453c17981d0ae3cc8_q0m6vsqxd.pdf.

66 R. DeFries et al., 'Monitoring Tropical Deforestation for Emerging Carbon Markets' *in* Paulo Moutinho and Stephan Schwartzman eds., *Tropical Deforestation and Climate Change* 35, 41 (Para, Brazil and Washington, D.C., United States: Amazon Institute for Environmental Research; Environmental Defense, 2005), available at http://www.edf.org/documents/4930_tropicaldeforestation_and_climatechange.pdf.

67 *See* Herold, note 65 above at 36 – 37.

68 The countries participating in REDD as of May 2010 are listed in the Synthesis Report: REDD+ Financing and Activities Survey, prepared by an intergovernmental taskforce for the Oslo Climate and Forest Conference, 27 May 2010 at 6, available at http://www.regjeringen.no/upload/MD/sub/oslocfc2010/dokumenter/REDDpluss_surveySynthesisReport_final_100528.pdf.

EU Emissions Trading Scheme (ETS) handed out even more emissions permits than there were emissions, causing a significant drop in the price of carbon and threatening both the economic and environmental validity of the trading system.[69] The multiple drivers and varying short and long-term trends of deforestation make it exceedingly difficult to construct a reliable national baseline for forestry emissions.[70] Consequently there is a significant risk of any REDD market mechanism encountering similar problems. Indeed, Brazil and the ALBA (Bolivarian Alliance for the Americas) countries oppose a REDD market mechanism precisely because they fear cheap REDD credits would flood international carbon markets causing a collapse in carbon prices, while also providing an incentive for developed countries to shirk domestic emissions reductions.[71]

MRV is the bedrock on which the ecological integrity of any future REDD market mechanism will rest, and is a crucial component of the next three issues at stake.

4.2 Addressing a Lack of Land Tenure and Property Rights

Industrial emissions are relatively easy to define in terms of property. Although the atmosphere, in theory, is the state's responsibility and a public good, the emissions themselves stem from easily defined and mostly privately owned buildings or vehicles. Therefore the right to sell emissions reductions credits lies with the owner of that property. In developing countries, however, private property rights over land often do not exist. Instead there is a complicated mixture of state ownership and customary indigenous/local rights. For example, in Papua New Guinea the state officially owns 97 per cent of forest land, however within this official definition much of the forest land in practice falls under customary indigenous law.[72] In Indonesia forest is officially considered state land, but the existence of overlapping (but often ignored) legislation protecting customary rights, as well as the fact that only twelve per cent of Indonesian forest has been officially gazetted, challenges this assumption.[73] In India land laws consist of a morass of conflicting legislation, and indigenous people and tribal communities often have little legal control over forests they customarily manage. This legal confusion results in susceptibility of established forest communities to exploitation by the government (who officially own much of the forest land) and by private companies (particularly the extractive industries).[74] In a market-linked REDD scheme, where value is suddenly and artificially created, this legal conflict could seriously compromise ecological integrity. Creation of equitable legal structures governing the ownership of carbon rights and the ownership of the land in which the trees reside (and the trees themselves) will therefore be crucial. Costa Rica's pioneering PES scheme has succeeded in reducing deforestation rates partly because of innovative legal structures recognising customary tenure.[75]

The implementation of new legal and policy structures (at a national level) to provide guidance in these current grey areas are almost always listed as imperative to the success of REDD in the recommendations of policy reports and in the project design documents of privately funded projects. However such reform has not been taking place on the ground. The experience of the Ulu Masen project, a large REDD pilot project situated in the province of Aceh, Indonesia, is illustrative of this

69 Larry Lohmann, 'Carbon Trading – A Critical Conversation on Climate Change, Privatisation and Power', 48 *Development Dialogue* 1, 87 (2006). This over-allocation has been amplified by the European recession. *See* Damien Morris and Bryony Worthington, 'Cap or Trap? How the EU ETS risks Locking-in Carbon Emissions', *Sandbag,* September 2010, available at http://sandbag.org.uk/files/sandbag.org.uk/caportrap.pdf.

70 Alain Karsenty, 'The Architecture of Proposed REDD Schemes after Bali: Facing Critical Choices', 10 *International Forestry Review* 3, 3 - 10 (2008).

71 'REDD after Copenhagen: the Way Forward', Summary of an IISD and ASB workshop held in Hue, Vietnam, 8-10 March 2010 at 6, available at http://www.iisd.org/pdf/2010/redd_ii_hue_workshop_report.pdf.

72 *See* Background Analysis of REDD Regulatory Frameworks note 6 above at 17.

73 Ross Andrew Clarke, 'Moving the REDD Debate from Theory to Practice: Lessons Learned from the Ulu Masen Project', 6/1 *Law, Environment and Development Journal* 36, 50 (2010).

74 Madhu Sarin, Laws, Lore and Logjams: Critical Issues in Indian Forest Conservation (London: International Institute for Environment and Development, 2005).

75 Katia Karousakis, 'Incentives to Reduce GHG Emissions from Deforestation: Lessons Learned from Costa Rica and Mexico', Organisation for Economic Co-operation and Development (OECD), 27 April 2007, Doc No. COM/ENV/EPOC/IEA/SLT(2007)1 at 17, available at http://unfccc.int/files/methods_science/redd/application/pdf/incentives_to_reduce_ghg_emissions_from_deforestation_lesson_learned_from_costa_rica_and_mexico.pdf.

point. The Ulu Masen project is a result of collaboration between an Australian bank and an NGO Flora and Fauna International (FFI), with the carbon rights the subject of an agreement between NGO Carbon Conservation and Merrill Lynch. Whilst the project covers 750,000 hectares of tropical rainforest, with 130,000 people living adjacent to the forest land included in the project, some of whom it is mentioned in the project design document lay claim to such land, and whilst the project is dependent on revenue from the sales of VERs, very little has been done to clarify what might be thought to be essential to the projects success – land tenure.[76] The project design document recognises the need to regularise tenure and recognise customary rights and yet contains no strategy for doing so. The regulatory environment is further complicated by the constitutional friction between the regional Aceh government and the national Indonesian government – with both exercising powerful claims to the control of REDD revenue. This constitutional dispute has previously resulted in a year-long conflict with a cost of thousands of lives in 2003-04, and the eventual imposition of martial law upon Aceh.[77] Ross Andrew Clarke writes that: 'While most REDD proponents accept the importance of clear tenure over forests for effective implementation, few explicitly recognise the extreme challenge this represents'.[78] Clarke quotes Martin Berg of Merrill Lynch as saying, regarding the Ulu Masen project, that: 'No country in the world has any experience on proving legally that a seller has the right to sell carbon from forests'.[79] While the Ulu Masen project developers, in following a 'learning by doing' approach, evidently hoped to learn the lessons of successful implementation as the project progressed, the investment of high levels of finance into a project with ill-defined legal status and with no strategy in place to improve this status appears highly risky, especially given the politically volatile nature of Aceh. Forestry carbon credits, already beset with problems about permanence, appear even more ecologically (and indeed financially) questionable when held in projects at the mercy of political whim. The regulatory structures of Aceh – uncertain, regional vying with national, customary with formal, vulnerable to political upheaval and unstable interpretation – are familiar to many REDD countries.

Multilateral funding for policy development and legislative agendas in REDD countries is, then, essential for an ecologically and socially successful market-led programme, however this funding will likely cause significant political dispute. At the international level accusations of neo-colonialism stemming from existing controversy over 'conditionalities' imposed by financial institutions such as the World Bank and IMF over past decades are likely.[80] Issues of sovereignty have already caused conflict within the climate regime (for instance China's reluctance to submit to international verification of its MRV techniques), and there is a risk that such tensions could be re-inflamed with the commencement of donor funded political reform.[81] On a national level there will likely be a tension between conservation and people-orientated policies. Kenya, for instance, has embarked on a mass eviction of citizens from the Mau forest in a bid to restore ecological services.[82] The potential financial rewards of REDD could exacerbate such conflict.

76 'Reducing Carbon Emissions from Deforestation in the Ulu Masen Ecosystem, Aceh, Indonesia', Project Design Note submitted to CCBA by the Provincial Government of Nanggroe Aceh Darussalem (Aceh), 2 Nov 2007 at 10, available at http://www.climate-standards.org/projects/files/Final_Ulu_Masen_CCBA_project_design_note_Dec29.pdf.

77 Rachel Harvey, 'Civilian Rule Returns to Aceh', *BBC News*, 24 May 2004, available at http://news.bbc.co.uk/1/hi/world/asia-pacific/3735391.stm.

78 *See* Clarke, note 73 above at 51.

79 *Id,* at 48.

80 *See* Stiglitz, note 48 above at 46 and Andres Olleta, 'The Role of International Financial Institutions in Water Law Reforms' *in* Phillipe Cullet et. al. eds., *Water Law for the 21st Century: National and International Aspects of Water Law Reforms in India* (Abingdon: Routledge, 2010). The role of the World Bank in advancing policies privatizing water supply in developing countries (in the name of encouraging sustainable use) has come under scrutiny and significant criticism. The World Bank's involvement in forestry through the FCPF also involves the attachment of market value on a public good, and may therefore fall foul of some of the problems plaguing water reforms (for example problems with public participation, MRV, and further entrenching socio-economic divides).

81 Bryan Walsh, 'With One Day to Go, Climate Talks Remain Stalled', *Time*, 17 Dec 2009, available at www.time.com/time/specials/packages/article/0,28804,1929071_1929070_1948612,00.html.

82 James Morgan, 'Kenya's Heart Stops Pumping', *BBC News*, 29 September 2009, available at http://news.bbc.co.uk/1/hi/8057316.stm and Xan Rice, 'Kenya Evicts Thousands of Forest Squatters in Attempt to Save Rift Valley', *Guardian*, 18 Nov 2009, available at www.guardian.co.uk/world/2009/nov/18/kenya-forest-squatters-evicted.

Such political disputes could seriously hamper the development of an effective REDD mechanism. Problems with corruption and embezzlement, especially in LDCs, could also play a major role in undermining the effectiveness and consequently the credibility of such reform especially if, as is the case in Ulu Masen, capital is invested and staked upon the production of carbon credits without first obtaining a firm legal basis for such activity.[83] As with the causes of poor MRV capacity, the indeterminate nature of property rights and land tenure in much of the developing world has been target for reform by the development community for several decades.[84] The ability of REDD mechanisms to induce widespread and equitable land reform in a matter of years appears questionable.

4.3 Ensuring Public Participation and Civic Involvement

Public education about, and participation in, REDD processes is crucial to ensuring a sufficiently robust civil society to challenge such potential negative outcomes. The public must be involved in the construction of any REDD scheme in order to ensure its effectiveness at a local level and economically efficient emissions reductions. REDD activities that run counter to local expectations, or exclude local communities, create political uncertainty un-conducive to investment, environmental protection, and social development.[85] Public participation is necessary to create stable societal and market conditions, and is also a core tool to prevent leakage and ensure the permanence of sequestered carbon. As mentioned above, problems with land tenure – indicative of insufficient participation - could result in evictions mounted against indigenous people (or other forest dwellers) causing conflict and compromising the financial and ecological success of a REDD scheme.

The exclusion of communities would indicate a policy failure where the symptoms rather than the drivers of deforestation were being addressed, and rather than providing emissions reductions would likely cause 'leakage' whereby deforestation is merely displaced. This is a particular problem with project-level activities (intended to provide 'learning by doing') which are not teamed with measures to address national and international drivers. The Noel Kempff Climate Action Project in Bolivia has attracted particular criticism, as the rates of deforestation in the country as a whole rise while the project attempts to gain credits for the sequestered carbon within its geographic boundaries.[86] Without engaging the wider public and business community as a whole, the drivers of deforestation (for instance the desire for a stable income/revenue from forest or agricultural products), simply relocate deforestation to unprotected areas. Such effects show the necessity of engaging in wider public participation and establishment of a suitable regulatory environment before market approaches can provide environmental benefits. The lack of validity of the VERs produced by pilot projects, rather than promote investor confidence, threaten to undermine the ecological basis of the REDD programme.

REDD activities that involve local communities have the potential to address a range of economic and ecological problems by providing a livelihood (remuneration for AD and potentially for ecological husbandry) and a motivated workforce of stakeholders (rather than forestry department agents and guards).[87] Market REDD schemes could potentially empower community groups to protect forests and biodiversity and reduce the logistical burden on governments, if MRV techniques are developed further (for example the use of hand-held and relatively cheap monitoring equipment) and successful pilot schemes are built on.[88] However, experience of pilot projects suggests that, as with land tenure, public participation is more a feature of project design documents and policy debates than of active implementation on the ground. UN-REDD

83 Corruption's influence upon policy reform is discussed in Paul Collier, *The Bottom Billion: Why the Poorest Countries are Failing and What Can be Done About It* (Oxford: Oxford University Press, 2007).

84 Robin Palmer, Literature Review of Governance and Secure Access to Land', Governance and Social Development Resource Centre and the UK Department for International Development, 2007 at . 3 – 8.

85 James Mayers and Stephen Bass, *Policy that Works for Forests and People: Real Prospects for Governance and Livelihoods* 4 (Sterling, VA: Earthscan, 2004).

86 Fred Pearce, 'Noel Kempff Project is 'Saving the Forest' While Forcing Destruction Elsewhere', *Guardian*, 11 March 2010, available at http://www.guardian.co.uk/environment/2010/mar/11/greenwash-noel-kempff-forests.

87 *Id.*

88 There is recognition of the need to involve indigenous people in REDD schemes at a UN level, as seen in: UN-REDD: Operational Guidance: Involvement of Indigenous Peoples and Other Forest Dependent Communities, UN-REDD Programme, 25 June 2009.

and the FCPF first instituted a REDD programme in DRC in January 2009. The UN claims that 'the mission set a precedent in terms of stakeholder engagement and participatory planning', including participation from various UN agencies, the World Bank, the Norwegian Government, NGOs and 'over 40 representatives from Congolese civil society and indigenous peoples'.[89] The mission resulted in the creation of a 'DRC Working Group on Climate and REDD', as well as the implementation of a 'REDD Decree' which established a National Coordination, an Interministerial Committee and a National REDD Committee. The National REDD Committee, responsible for approval of both policy and the REDD work programme in the DRC, is constructed with a third of its membership representing civil society and indigenous people's organisations. This presence of non-governmental actors, states the UN, 'is unprecedented not only in the DRC but also in countries pursuing REDD readiness activities' and 'represents an excellent positive example of good governance for REDD'.[90] However, in August 2010, an Australian carbon trading company named Shift2Neutral announced the signing of a deal with 'the spokesperson of the senate' (of DRC) for 'environment and renewable energy' which covers the whole country and provides for the certification and selling of carbon credits and the financing of forestry management strategies 'on behalf of the DRC'.[91] There is no mention of Shift2Neutral in the various project design documents produced by UN-REDD and the FCPF, despite the firm claiming negotiations had lasted 'for more than a year' – nor is there any mention in the firm's press release about any agreement with the National REDD Committee or the Interministerial Committee - the bodies supposedly set up to run the REDD work programme. It appears that the rights to the carbon held in the whole of the DRC (2.34 million sq km) have been provided to an Australian carbon trading firm by the Spokesperson of the Congolese Senate, completely bypassing structures set up to facilitate community involvement and participation in a scheme with the potential to transform the Congolese economy.

The potential for such abrogation of duties regarding public participation is huge in countries as wracked with political and social strife as the DRC. However, experiences with market involvement in environmental policy in fully developed countries have also led to public participation and equity concerns. U.S. experiences have shown that market-orientated approaches are not always suited to public participation and to the maximisation of social welfare functions. Markets work on the basis of achieving financial profit at least cost. Public participation is conventionally seen to obstruct the freedom of such a system to operate at highest possible efficiency. Stephen M. Johnson writes that 'many market-based approaches to environmental protection affirmatively encourage polluters to shift pollution to lower-income communities … Classical economic theory institutionalises and exacerbates existing social disparities that are based on unequal distributions of income'.[92] One of these 'social disparities' is that of access to information and participation in decision-making processes.

For example, through RECLAIM, an L.A. cap-and-trade scheme intended to reduce air pollution, the pollution was redistributed to poor communities with most need for jobs and least means to fight a large commercial institution – where demand for public participation was smallest.[93] The potential also exists for a similar situation to occur with market-linked REDD schemes, with large, and therefore lucrative, industrial forestry projects preferred over smaller community-based projects offering fewer credits. Insecure land-tenure would exacerbate this potentiality. The temptation among carbon investors will be to avoid engaging in the tangle of conflicting rights claims (particularly ill-defined and un-respected customary and indigenous titles) by, through collusion with revenue-seeking governments, using land evictions and regulatory reform to simplify the legal territory and claim large tracts of land. Indeed, experience in PNG suggests that illegal government collusion with businesses seeking tradable carbon rights

89 Engaging Civil Society in REDD: Best Practice in the Democratic Republic of Congo, UN-REDD Programme, November 2009 at 3, available at http://www.un-redd.org/Newsletter3_Congo_best_practice_en/tabid/2038/language/en-US/Default.aspx.

90 *Id* at 4.

91 Details of Shift2Neutral's deal in the DRC are contained in Chris Lang, 'Shift2Neutral's Big REDD Deal in the Democratic Republic of Congo', *REDD-Monitor*, 27 August 2010, available at http://www.redd-monitor.org/2010/08/27/shift2neutrals-big-redd-deal-in-the-democratic-republic-of-congo/.

92 *See* Johnson, note 42 above at 3.

93 *Id,* at 6.

may already be occurring.[94] Two ways to combat the potential for this effect in REDD are to a) implement a set of uniform criteria regarding public participation that countries must fulfil in order to achieve entrance to an international forest carbon market mechanism, and b) encourage a 'value-added' approach, where the social/biodiversity functions of standing forests are financially valued, thereby making public participation a way of generating profit rather than obstructing it.

Recognition of the potential shortcomings of participatory processes in many REDD countries led to the development of 'REDD+' schemes which attempt to ensure the participation of local populations in project design. However the integrity of such schemes and the likelihood of the above criteria being adhered to are questionable, when, as the Shift2Neutral deal demonstrates, the governance structures at a national level are insufficiently robust to insist on such adherence. Indeed, uncertain legal guidance at the international level further alienates forest peoples from the decision-making process. At Copenhagen, the SBSTA decision on methodologies and the Accord itself both failed to mention the rights of indigenous peoples, with a notable absence of mention of the UN Declaration on the Rights of Indigenous Peoples (which was present in earlier drafts).[95] This disregard appears to have continued in the formation of the REDD+ Partnership (expected to be influential regarding any eventual REDD agreement), which is facing accusations of failing to live up to its promises of stakeholder involvement.[96]

4.4 Addressing Public and Private Interaction

The growing assumption in REDD negotiations that there will be initial use of pledged funds to create favourable regulatory environments in host countries and to leverage private finance for REDD projects relies on the dovetailing of public and private interests and methods. However, the assumption that this dovetailing will occur organically is ill-founded. The U.S. wetlands banking scheme, similar in structure to some proposed REDD schemes based on national accounting, is particularly illustrative of the long process that needs to be undertaken to adapt market conditions to achieve environmental benefits.

The wetlands banking scheme was initiated on the basis of the Environmental Protection Agency (EPA) adopting a 'No Net Loss' (NNL) strategy regarding wetlands. This NNL policy was operationalised by the creation of a mechanism requiring firms developing on notable wetlands to pay a permit provider ('permittee') for the offsetting of these wetlands in the form of purchasing wetlands 'credits'. Initially these replacement wetlands were created by the permittee itself, however the permittees often had little ecological expertise and the 'on-site' and 'in-kind' requirements (i.e. that the replacement wetlands were created on or nearby the developed site, and that they were of a similar type) limited the ecological success of such projects.[97] The EPA, charged with the task of overseeing the validity of these projects, also faced MRV difficulties as the offsets were numerous and small-scale, which when coupled with low agency staffing levels resulted in few being checked and the consequent crediting of non-existent or sub-standard projects.[98]

To address these problems, private sector generation of wetlands credits was introduced, whereby private bodies could register as 'accredited wetlands providers' and sell the resultant credits to wetlands programme administrators, who would then offer the credits to the permittee, to sale on to the developer. This was called a 'credit resale programme'. The idea was that private bodies would compete to offer the most ecologically valuable wetlands at the lowest price, and relieve the problems mentioned above. However, currently only 10-

94 'Papua New Guinea and Carbon Trading: Money Grows on Trees', *The Economist,* 6 June 2009, available at http://www.economist.com/node/13724646?story_id=13724646&source=features_box_main.

95 *See* Copenhagen Accord, note 9 above a*nd* Francesco Martone, 'Taking Stock of Copenhagen: Outcomes on REDD+ and Rights', 2010, p. 3, available at http://www.forestpeoples.org/documents/ifi_igo/redd_cop15_copenhagen_review_jan10_eng.pdf.

96 Chris Lang, 'Civil Society Excluded from Interim REDD+ Partnership Meeting in Brasilia', *REDD-Monitor*, 15 July 2010, available at http://www.redd-monitor.org/2010/07/15/civil-society-excluded-from-interim-redd-partnership-meeting-in-brasilia/.

97 Leonard Shabman and Paul Scodari, 'Future of Wetlands Mitigation Banking', *Choices*, 1st Quarter 2005, available at http://www.choicesmagazine.org/2005-1/environment/2005-1-13.htm.

98 *Id.*

20 per cent of wetlands credits are provided by private actors and many of the old problems persist.[99]

There are several reasons for the problems with the scheme. Firstly, government barriers and regulation, ostensibly to ensure ecological validity, raise the costs of becoming an accredited supplier of wetlands credits to a prohibitive level. Private bodies have to endure a process of review by the mitigation banking review team (MRBT) that can take several years, and incur large fees from legal and technical experts.[100] Meanwhile, permittees providing sub-standard or non-existent offsets themselves are adding little ecological benefit or replacement.

Secondly, private bodies are reluctant to invest capital in an uncertain climate. The regulatory regime surrounding the wetlands programme is constantly in flux, as initially basic-seeming terms such as 'wetlands' and 'fill' are debated and re-defined, and private investors are consequently worried that definitions will change and render their wetlands ineligible for credit.[101] Similar debates regarding definitions of 'forest' and 'forest degradation' scuppered the forestry CDM, and have dominated REDD negotiations.[102] Indeed, Sasaki and Putz have shown that the current UNFCCC definition of forest (0.05 – 1 hectare in size, consisting of 10 – 30 per cent covered by canopy from trees reaching at least 2 – 5 meters in maturity) would allow forest owners to significantly degrade their forest resulting in a large loss of stored carbon whilst still remaining within the UNFCCC definition of 'forest' and therefore potentially receiving offset credits in a future REDD agreement.[103]

Thirdly, if a private body does make it through the MRBT review it then has to comply with strict results-based performance criteria to ensure a flow of credits. However, even these criteria are uncertain as there are multiple criteria for assessing a site – assessment could be based on hydrology, ecosystems or water quality, to name a few. Biologists disagree on how many credits should be issued because they are each using a different set of conditions.[104] This uncertainty further repels investment. In terms of forestry, the uncertainty created by the multiplicity of organisations conducting REDD pilot (or 'start-up') programmes is compounded by the fact that there are varying criteria and certification schemes with which to assess REDD projects.[105] The methods for maintaining the baseline in the wetlands programme are ecologically questionable ('in-site' and 'in-kind' are not necessarily viable). In forestry terms lack of definitional clarity could lead to plantations or monocultures replacing natural forests resulting in biodiversity and livelihood loss. Currently, forestry project developers can effectively pick the certification scheme and inventory method which best suits their commercial interests.[106]

The manifestation of these phenomena associated with the wetlands programme can already be witnessed in REDD as some large investment firms prominent in financing CDM projects withhold their funds from forestry projects, while others take on significant risk in beginning projects in the midst of uncertainty.[107] There is currently little national (or international) regulation regarding public-private interaction on REDD projects. The level and form of interaction between public sector and private sector will therefore need to be hammered out before the incorporation of market-based activities

99 Leonard Shabman and Paul Scodari, Past, Present, and Future of Wetlands Credit Sales 10 (Washington, D.C.: Resources for the Future, Discussion Paper 04-48, 2009) available at http://www.rff.org/documents/rff-dp-04-48.pdf.

100 *Id,* at 11.

101 *Id.*

102 Ian Fry, 'More Twists, Turns and Stumbles in the Jungle: A Further Exploration of Land-Use, Land-Use Change and Forestry Decisions within the Kyoto Protocol', 16 *RECIEL* 341, 341 – 342 (2007).

103 Nophia Sasaki and Francis E. Putz, 'Critical Need for New Definitions of 'Forest' and 'Forest Degradation' in Global Climate Change Agreements', 2 *Conservation Letters* 226, 226 (2009).

104 *See* Shabman and Scodari, note 99 above at 11.

105 For example there is the option of VER+, CCAR, VCS, CCBA, Gold Standard VER, to name a few. A list of certification schemes is provided on the EcoSecurities website, available at http://www.ecosecurities.com/Home/Voluntary_offsetting/Carbon_offsetting_and_standards/default.aspx.

106 Beth Zgoda, 'Standardization of REDD Monitoring Technology to Level the Playing Field', 10 *Sustainable Dev. L. & Pol'y* 16 (2010). Zgoda notes that varying forest carbon inventory methods allow for inaccurate reporting and non-fungible credits, increasing the potential to undermine ecological validity.

107 *See* 'Background Analysis of REDD Regulatory Frameworks', note 6 above at 20. CDM project developers such as EcoSecurities, Camco and Climate Change Capital have been dissuaded from investing in REDD projects because of uncertain regulatory frameworks.

within a REDD programme. Quick and authoritative decisions on the basic long-term future framework of REDD are essential if markets are to play any part in limiting temperature rise to two degrees Celsius, in order to give private entities the time to prepare and understand their potential roles in such a system. Evidence shows that markets take time to function effectively – players need time to learn their roles and the best ways of operating within the regulatory structures.[108] However, uncertainty within the climate regime has increased since the failure of Copenhagen, and efforts made to regain momentum (such as the REDD+ Partnership) appear to have been plagued with procedural problems and organisational mayhem.[109]

The U.S. wetlands programme demonstrates the difficulty of artificially creating a market and managing the actors within it to ensure the goals of those who brought the market into being are met whilst also meeting the commercial objectives of those who wish to take advantage of newly created market opportunities. The programme provides an example of a system that overcompensates for ecological integrity in the face of private sector involvement, to the extent of actually damaging such integrity. A market-based system will only provide capital, efficiency, and flexibility (the things that have attracted the public sector to it in the first place) if it is allowed to be a market-based system; however to insure the intended environmental benefits of such a market, a certain level of regulation will be needed. A careful trade-off is required. As Shabman and Scodari point out with regard to the wetlands project, a large fund will be needed to cover start-up costs of a marketised environmental protection scheme, but those costs will be covered when a popular and effective system is running and MRV and administration costs can be covered by imposition of a small tax on transactions.[110] Confidence that an effective market-system will emerge is essential, however, to persuading states and investors to contribute large sums to the fund and to start-up projects. While some REDD proponents appear to advocate a 'learning-by-doing' approach as the best way to engage the private sector and achieve ecological validity, experience shows that this often entrenches bad practice and makes adjusting a corrupted system difficult.[111] A consistent and detailed regulatory environment is crucial to creating an environmentally and economically effective market mechanism for REDD.

5 POLICY PROPOSALS

There is significant environmental and economic risk in establishing a REDD market mechanism. An infinitely variable set of externalities exist, and for a market mechanism to be ecologically successful, a huge international effort (both logistical and financial) must be set in motion. Any market in REDD credits will be artificial and prone to sub-optimal outcomes as market participants respond to market opportunities rather than to the underlying objectives of those who brought the market into being.

This is particularly pertinent with regard to a REDD system which, in the form of UN-REDD and FCPF pilot programmes and existing voluntary carbon markets, began encouraging private sector participants without the necessary legislative checks and balances in place first. The promises of quick and efficient carbon reductions belied the complexity of the problem of deforestation – complexities which are only beginning to be fully understood now.

There are many crucial elements to get right in a forest carbon market, often involving the management of apparently conflicting political directions and legislative trade-offs. A market based on national accounting with governments as the primary actors is required to satisfy the state-based targets of the climate regime, to provide the volume of emissions reductions needed, and to reduce leakage. However, a market that recognises local economic/environmental conditions and allows local communities to become involved and remunerated is also essential. Private investment is required to generate

108 *See* Tietenberg, note 53 above at 6.
109 *See* Lang, note 96 above.
110 *See* Shabman and Scodari, note 99 above at 19.
111 *See*, for instance, the problems with additionality and environmental integrity that have plagued the CDM mechanism. Christina Voigt, 'Is the Clean Development Mechanism Sustainable? Some Critical Aspects', 7(2) *Sustainable Dev. L. & Pol'y* 15 (2008).

sufficient scale and capital, yet an ecologically valid forest carbon market needs to be systematically regulated (including a command-and-control safety net). There needs to be a valuation of public goods, whether through the market in the form of an ecosystem services approach, or through government incentives to 'value-added' forestry projects. Strict criteria need to be in place regarding access to international carbon markets (to ensure sufficient regulatory frameworks have been implemented), but wide participation needs to be ensured to provide global environmental goods.

This paper suggests that in the short to medium term the focus should be upon improving legislative frameworks in the developing world so that they are not antagonistic to forests, whilst improving MRV capacity and supporting development of civic society. Experience in states such as Brazil and Costa Rica shows that modest environmental gains can be made through implementation of command-and-control legislation, gains that can be amplified if met with corresponding legislation in major economies (including the BASIC countries) regulating consumption of products driving deforestation in the developing world (for instance soy beans, exotic timber, palm oil, beef).[112] This programme of legislative change should be aided by developed country funds, potentially raised through an innovative mechanism such as an aviation, fossil fuel or international financial transactions tax, and facilitated through an international agency such as the UNEP/UNDP. The potential of bilateral agreements such as that between Norway and Brazil resulting in the Amazon Fund should also be explored.[113] The programme should be removed from the immediate remit of the climate regime until measurable and ecologically valid carbon reductions can be measured without fear of leakage.

This paper suggests that in the long-term a successful market system could be developed, building on Randall S. Abate and Todd A. Wright's hybrid compensated reductions and preventive credits proposal, Charlotte Streck's 'nested' approach, and James Hansen's 'fee-and-dividend' plan.[114] Such a system would see governments acting as middle men – verifying, buying and selling forestry carbon credits produced by community projects or trusts, private companies, or government departments, with the aim of meeting national deforestation targets. Such verification would be open to scrutiny by a UN/IPCC inspectorate (avoiding the conflicting interests that have plagued the CDM's verification bodies, the Designated Operational Entities). A tax on REDD projects verified and sold by governments could be held in reserve until a certification period whereby the UN inspectorate would decide whether a government had achieved pre-designated national forestry targets (a baseline), with the release of the funds as a dividend to the host government if successful. This would maintain the incentive of both the credit producer and the government to insure ecological validity. Admittance to markets would be based on achievement of a set of MRV, governance, and participatory criteria. A vibrant market demand for REDD credits could be initiated by the adoption of ambitious emissions targets by developed countries. Substantial legislative work would have to take place to regulate the interactions between the production of credits by small producers and the buying of such credits by the government (or a government agency). The elimination of direct selling of carbon credits by private entities onto the carbon markets would perhaps reduce immediate revenues and reduce attractiveness to private entities, but an independently monitored exchange system with government would provide certainty and transparency necessary for both ecological validity and commercial interests.

A national government would thus manage a policy portfolio addressing deforestation including both market and non-market measures, in thrall to internationally defined baselines. Effective management of such a

112 Costa Rica has succeeded in reversing a trend of deforestation by introducing laws banning land-use change and logging. *See* Costa Rica Presentation, note 33 above and on drivers *see* Erin C. Meyers Madeira, Policies to Reduce Emissions from Deforestation and Degradation (REDD) in Developing Countries: An Examination of the Issues Facing the Incorporation of REDD into Market-based Climate Policies 69 (Washington, D.C.: Resources for the Future, 2008), available at http://www.rff.org/RFF/Documents/RFF-Rpt-REDD_final.2.20.09.pdf .

113 'Norway pledges $1 billion to Brazil Amazon Fund', *Reuters*, 16 Sept 2008, available at http://www.reuters.com/article/idUSN1649421720080916.

114 *See* Abate and Wright, note 61 above and Streck et al., note 1 above and Bibi van der Zee, 'James Hansen Rails Against Cap-and-trade Plan in Open Letter', *Guardian Environment Blog*, 12 Jan 2010, available at http://www.guardian.co.uk/environment/2010/jan/12/james-hansen-carbon-emissions.

portfolio would require widespread legislative change and, in effect, a mass development push in some of the poorest and most ill-governed states on earth.

Whilst REDD-type programmes linked to markets appear to have an important role to play in environmental protection over the long-term, in the short-term a focus on creating adequate market conditions for a REDD mechanism as part of the UNFCCC's attempt to limit temperature rises to two degrees Celsius risks obfuscating pressing concerns regarding energy production and consumption in the developed world. The rush to institute REDD quickly is more a symbol of the intractability of other issues (particularly of a climate regime increasingly dominated by the geo-political power struggle of the U.S. and China), than any indication of its ability to quickly and efficiently leverage markets to work to reduce emissions. The mass economic and social transformation required for a market-linked REDD which can maintain ecological validity is unsuitable for efficient emissions reductions in the context of the short-term targets of the climate regime.

In a wider context, if there is a significant consolidation of global political will over time, and REDD schemes are backed with aggressive government action creating favourable economic conditions for the preservation of global public goods, REDD could potentially be the tipping point for economic revelation, whereby 'commercial actors can be expected to maximise the emission reduction or sequestration potential of their investments' and where any investment is predicated on sustainable development valuing public goods as well as on private gain.[115] For REDD, where the marginal benefits of cleared land are balanced against the marginal costs to society of forest loss.[116] Although this shift would be distasteful to many environmentalists as it would essentially usher in the privatisation of altruism, and distasteful to many traditional economists as it would ostensibly reduce market efficiency, it would prove that the market could indeed work to preserve public goods.

On the other hand, a REDD market mechanism could merely represent a naïve faith in the market economy's ability to work for the environment and merely highlight the disparity in motivation between private and public realms. Corruption and social/political instability could suck funds away from intended uses, and government or corporate land grabs could create antagonism and merely displace deforestation to other areas. MRV deficiencies could hinder the valuation of carbon stocks and result in the trade of 'hot air', as with the EU ETS. Increasing consumer demand could ensure that it will never be more profitable to keep forests standing rather than cutting them down. The success or failure of a REDD market mechanism will be indicative of a wider economic story, one with significant implications for the success of the climate change regime as a whole: is capitalism capable of attaching financial value to future public and environmental goods that are temporally non-specific and intangible?

6 CONCLUSION

This paper has traced the trajectory of the REDD programme within the climate regime and identified the arguments made for use of markets in solving environmental problems in the wider critical discourse. It has analysed the efficacy of market mechanisms within environmental policy-making in 'the real world', drawing on examples from REDD pilot schemes and from other environmental protection programmes. It concludes that while there is a possibility of environmental goods being secured by use of markets in the long-term, the claims made for REDD as an efficient and quick way of making large global cuts in emissions and as a means to 'buy time' in restricting temperature rise to two degrees have been overstated. Such claims have understated the political, social and economic costs of instituting widespread legal and economic reform across swathes of the developing world, and overstated the current ability of markets to provide measurable, reportable, and verifiable emissions reductions. As deforestation is a symptom of complex socio-economic forces, addressing deforestation requires a raft of supportive measures unsuited to the climate regime and inchoate with the temporal restrictions of a Kyoto-type protocol.

115 *See* Ebeling, note 37 above at 53.

116 Rosimeiry Portela, Kelly J. Wendland and Laura Ledwith Pennypacker, 'The Idea of Market-Based Mechanisms for Forest Conservation and Climate Change' *in* Streck et al. eds., note 1 above at 11, 13.

'Environmental integrity', defined as the 'ability of an environmental measure to reach its objective and purpose' – in this case the objective being Article 2 of the UNFCCC – appears beyond the abilities of a market-based REDD mechanism.[117] Rather, excessive reliance upon progress in REDD negotiations risks a corresponding lack of attention given to other areas of the climate regime – such as addressing energy production – which are relatively more assured of producing achievable and measurable emission reductions in the short-term.

117 *See* Voigt, note 111above at 16.

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