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Governing and implementing REDD+

Esteve Corbera ^{a,b,1,*}, Heike Schroeder ^{c,1}

^a School of International Development, University of East Anglia, Norwich NR4 7TJ, United Kingdom

^b Institute for Environmental Science and Technology, Autonomous University of Barcelona, Spain

^c Oxford Centre for Tropical Forests, Environmental Change Institute, School of Geography and the Environment, University of Oxford, United Kingdom

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ABSTRACT

Reducing emissions from deforestation and forest degradation, conserving and enhancing forest carbon stocks, and sustainably managing forests (REDD+) are emerging as a central policy instrument to halt land-use related emissions from developing countries. In this article we introduce a special issue dedicated to understanding the governance and implementation dimensions of REDD+ at international, national and local levels. We use the earth system governance framework developed by [Biermann et al. \(2009\)](#) to illustrate the key governance issues underlying REDD+ and we highlight three main pillars for a future research agenda, namely (1) the politics of REDD+ in international and national negotiations; (2) the interplay between REDD+ policies and measures and other developments in land-use related processes; and (3) the examination of the environmental and socio-economic outcomes of REDD+ activities, integrating locally informed monitoring, reporting and verification (MRV) techniques and using robust counterfactual assessment methods.

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1. Introduction

Land-use change contributed to approximately 20% of global greenhouse gas (GHG) emissions during the period 1990–2000 and has represented a lower percentage (12% in 2008) during the first decade of this century due to the significant growth of global fossil-fuel emissions ([Houghton, 2005](#); [Le Quéré et al., 2009](#)). In this context, incentivizing reductions in GHG emissions from deforestation and forest degradation, conserving and enhancing forest carbon stocks and sustainably managing forests (REDD+) have emerged as a key international strategy to halt land-use change in developing countries and involve them in climate change mitigation efforts ([Angelsen, 2009a](#)). Essentially, REDD+ is expected to establish incentives for developing countries to protect and better manage their forest resources, by creating and recognising a financial value

for the additional carbon stored in trees or not emitted to the atmosphere. Drawing on the contents of the Copenhagen Accord and the current progress under the United Nations Framework Convention on Climate Change (UNFCCC), REDD+ is becoming one of the key pillars of a post-2012 international climate regime, particularly regarding developing country mitigation efforts.

UNFCCC negotiations on REDD+ were launched at the 11th Conference of the Parties to the United Nations Framework Convention on Climate Change held in Montreal in 2005 (COP-11) and continue through 2010 under the UNFCCC Subsidiary Body for Scientific and Technical Advice (SBSTA) and the Ad Hoc Working Group on Long-term Cooperative Action (AWG-LCA) (post-2012). It is still unclear whether future REDD+ incentives will be provided by multilateral or bilateral public funding, with or without a link to carbon markets and involvement from the private sector, or whether it will be a

* Corresponding author at: School of International Development, University of East Anglia, Norwich NR4 7TJ, United Kingdom. Tel.: +44 1603 592808.

E-mail address: e.corbera@uea.ac.uk (E. Corbera).

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combination of public-based finance and a market trading REDD+ credits (Reed, 2010). In this regard, the uncertainty surrounding the establishment of a truly global carbon market after COP-15 seems to suggest that private investors' participation in REDD+ emission reductions in the near future may be severely constrained (Corbera et al., 2010a).

REDD+ activities are likely to be coordinated and led by governments, with sub-national activities being developed in cooperation with government agencies, promoted by local private or public actors, or by a combination of both REDD+ incentives resulting from successful implementation would be issued exclusively to governments by the UNFCCC except, of course, for carbon traded through sub-national activities which may be asked to make their accountability transparent to national governments in order to avoid double counting. Therefore, it has been argued that REDD+ might be unattractive to the private sector if it implies complex and/or unclear participation and benefit-sharing arrangements (Estrada, 2010). Following the Subsidiary Body for Scientific and Technological Advice (SBSTA) programme on methodological recommendations, Parties at COP-15 encouraged developing countries to use the most recent IPCC guidance and guidelines for estimating anthropogenic forest-related GHG emissions by sources and removals by sinks, forest carbon stocks and forest area changes (Decision 4/CP.15).

Along these evolving negotiations, there has been a proliferation of multilateral and bilateral funds to support the development of REDD+ strategies and demonstration activities in developing countries. Institutions like the World Bank through the Forest Carbon Partnership Facility (FCPF), the UN through the UN-REDD programme and countries like Norway, Germany and the UK have established funding programmes to help developing countries set up both forest cover and deforestation and forest degradation reference levels, MRV systems and designing a REDD+ national strategy (Reed, 2010). These programmes have already supported more than 40 developing countries, in analysing historical land-use data, designing their deforestation baselines and drafting their strategies (Davis et al., 2010a,b). These initiatives were recently expanded by the establishment of a multi-country, voluntary partnership (i.e. Oslo-Paris REDD partnership) to mobilise additional financial and technical resources to develop REDD programmes and activities in developing countries. The partnership involves 16 developed and 40 developing countries (www.oslocfc2010.no). Additionally, these last two years a number of conservation and development organisations have developed REDD+ project-based, local activities which, as noted above, may sell their future carbon reductions on voluntary and other emerging regulated markets or integrate them to the national schemes, as has already occurred in the case of pre-CDM agroforestry and conservation projects (Corbera et al., 2009).

What is REDD+ at the country-level going to look like then? National strategies are likely to differ and involve diverse and combined Policies and Measures (PAMs), being suited to the country's economic, political, historical and environmental context. PAMs can include a diversity of options depending on which sectors, land-use processes and actors are targeted. As Angelsen (2009b) suggests, countries may attempt to increase agricultural rents by supporting intensive agriculture and

promoting technological change to increase productivity, although each of these options could result in negative feedback loops leading to further deforestation and degradation. The same trade-off problem may occur if countries consider options to increase forest extractive or protective rent, like reducing government fees on logging companies or developing systems of Payments for Environmental Services (PES). Countries can also consider enhancing the level of protection of their protected areas or even expand their number, and they can also opt for improving the effectiveness of sustainable forest management and reduced impact logging programmes, involving forest concessionaires and rural communities. Whichever options are chosen, it is evident that if aimed to be effective and inclusive REDD+ will face considerable governance challenges, such as coordinating policies and addressing corruption, as it has already been documented for Papua New Guinea (Forsyth, 2009; Angelsen, 2009b; Tacconi et al., 2009; Melick, 2010).

The development of, on the one hand, the REDD+ UNFCCC policy framework, focused principally to date on establishing and supporting the methodological and technological foundations for analysing forest cover and changes in carbon stocks, and on the other, the multiplicity of initiatives and actors involved in the voluntary carbon markets and pilot projects across geographical scales provide the foundation for the theme of this editorial and the special issue we are introducing here. We concur with Gregersen et al. (2010, p. 15) when they suggest that 'current writings on REDD and REDD+ almost all stress to a greater or lesser extent the need to focus on governance issues. Yet most of the available literature does not get into the subject of governance improvement in depth, and particularly not at the country level'.

REDD+ represents contemporary environmental governance in the making, insofar as it reflects 'the changing nature of the state and the proliferation of actors and mechanisms involved in the governing of societies' (Bulkeley and Newell, 2010, p. 11), which in this particular case concerns specifically societal relations with forest conservation and management at global, national and local levels, subject to uncertain outcomes. REDD+ is a governance process with multiple actors, interests and activities, involving several sources of formal and informal power and authority (UN bodies, multilateral organisations, governments, but also community and indigenous organisations), which all influence each other and may or may not coincide in their interests and vision regarding how such strategy of forest and climate governance should actually look like in the near future. REDD+ exemplifies how a scientifically informed policy idea (i.e. land-use change related emissions contribute significantly to climate change and biodiversity loss) permeates through multiple spheres of decision-making and organisation, creates contested interests and claims, and translates into multiple implementation actions running ahead of policy processes and state-driven decisions.

There have been other collective scholarly initiatives analysing the evolving REDD+ framework but we think that these had either a broad-ranging approach to the theme (see e.g. Special Issue in International Forestry Review 2008 10(3)) or focused almost exclusively on methodological issues (see e.g. Special Issue in Environmental Science and Policy 2007

10(4)). In contrast, the following compilation of articles treats very neatly a number of relevant issues to understand how REDD+ is shaping to date from the perspective of such multiple processes, actors and geographical scales. The issue incorporates contributions which reflect on critical aspects for governing and implementing the emerging regime, such as governance complexities (Thompson et al., in this issue; Skutsch et al., in this issue), what we have learnt so far from international forest governance (Kanowski et al., in this issue), how REDD+ actions and outcomes should be monitored and verified across scales (Grainger and Obersteiner, in this issue; Palmer Fry, in this issue), and what the legal implications are of such a regime for developing countries, particularly for indigenous peoples (Lyster, in this issue). In addition, the issue brings novel insights from pilot activities in a variety of countries and regions, including Mexico, Uganda, Peru, Brazil and Cambodia (Cerbu et al., in this issue; Ezzine de Blas et al., in this issue; Hajek et al., in this issue; Peskett et al., in this issue), as well as methodological advice on how to conduct future evaluations of REDD+ local activities (Caplow et al., in this issue).

In the remainder of this paper, we set the scene of the issue by illustrating five key dimensions of REDD+ governance research, following the framework of the Earth System Governance Project (Biermann et al., 2009). The framework dimensions encompass architecture, agency, adaptiveness, accountability and allocation and access which, on their own or combined, can guide present and future research efforts to improve our understanding of what REDD+ is becoming and what it will achieve. To illustrate the relevance of each dimension for research on REDD+ design and implementation, we rely on published literature and the special issue contributions. However, we already advance here that some insights clearly constitute cross-cutting themes across dimensions, thereby leading to some blurred conceptual boundaries. To conclude, we summarise existing research gaps and draw up a research agenda for the future.

2. REDD+ governance

The emerging REDD+ regime is embedded in larger governance architectures as deforestation and forest degradation are related to other global change processes (Biermann et al., 2009; Rockström et al., 2009). Traditional government institutions, organisations and mechanisms are often ill-equipped to meet the challenges posed by large-scale, global transformations. This implies that governance systems that transcend national boundaries, link different geographical and governance scales, and enable traditional and non-traditional policy actors to interact are increasingly required. Such governance perspective emphasizes the interrelated and increasingly integrated system of formal and informal rules, rule-making systems and actor networks at all levels of governance that are set up to steer societies towards preventing, mitigating and adapting to global and local environmental change. In particular, governance refers to the ‘forms of steering that are less hierarchical than traditional governmental policy-making (even though most modern governance arrangements will also include some

degree of hierarchy), rather de-centralized, open to self-organization, and inclusive of non-state actors that range from industry and non-governmental organizations to scientists, indigenous communities, city governments and international organizations’ (Biermann et al., 2009, p. 4).

Deforestation and degradation pose an enormous challenge, especially given their varied, context-specific and dynamic drivers (socio-economic, demographic, political, etc.), the multitude of norms, rules and policies in place in different countries and at different levels of governance, and the difficulty for developing countries to forego conventional economic development (Humphreys, 2006). We know that the involvement of logging concessionaires and rural communities in sustainable forest management practices has traditionally been a challenging endeavour, requiring substantial public investment in rule-making, capacity-building, monitoring and certification processes (Nasi et al., 2010). It is for all these reasons that it is argued that although REDD+ should not be a governance reform per se, it will affect or be affected by existing forest governance to a considerable extent (Larson and Petkova, 2010).

REDD+ is rapidly morphing into a slew of unorchestrated, multi-level, multi-purpose and multi-actor projects and initiatives. It permeates multiple spheres of decision-making and organisation, creates contested interests and claims, and translates into multiple implementation actions running ahead of policy processes and state-driven decisions, which could distinctively affect different regions, locations and ecosystems (i.e. from standing forests to highly commodified and evolving frontier areas) (Skutch and Van Laake, 2009; Ramsteiner, 2009; Humphreys, 2008). This special issue aims to uncover the nature of this new international regime,¹ how it is unfolding nationally and locally, and what are the implications for governance and research.

2.1. REDD+ architecture

Architecture refers to the governance meta-level, i.e. the institutions, organisations, principles, norms, mechanisms and decision-making procedures (Biermann et al., 2009, 2010). Understanding REDD+ governance and implementation requires examining this meta-level across governance levels, while at the same time examining the performance and effectiveness of this architecture in relation to its objectives (i.e. reducing emissions from land-use change and enhancing forest carbon stocks), and its interplay with other institutions (Young et al., 2008). The principal assumption behind the concept of interplay is that the interaction between two or more institutions and institutional arrangements can compromise their effectiveness. In REDD+, interplay may occur vertically between the top-down international REDD+ norms

¹ There are several definitions of what constitutes a regime (see e.g. Keohane, 1982; Young, 1986; Smouts, 2008). Generally speaking, it consists of ‘a set of interrelated norms, rules and procedures that structure the behaviour and relations of international actors so as to reduce the uncertainties that they face and facilitate the pursuit of a common interest in a given issue area’ (Le Prestre, 2002; cited in Smouts, *ibid.*). All definitions agree, however, that regimes are made up of rules, actors shaping and abiding by such rules, and sanctioning authorities.

and procedures and existing national-level policies and local-level institutions (e.g. property rights) and pilot activities, or horizontally between national PAMs aimed at reducing deforestation and degradation and other national land-use related policies and processes.

Some argue that the international and national architectural foundations of REDD+ should be built on the principles of 'good governance' because they will affect positively the overall legitimacy of REDD+ (Hyden et al., 2008). These principles encompass 'transparent and inclusive policy making; coherent science-based policy that removes barriers to success and sustainability and promotes wise use of technology and markets; accountable and transparent bureaucracy with monitoring and enforcement capacity; and a strong civil society' (World Bank, 2000, cited in Larson and Petkova, 2010, pp. 1–2). However, these principles are not sufficient to ensure the legitimacy and effectiveness of REDD+, insofar as deforestation and degradation are driven by processes which can be external to the forest sector, such as existing, evolving and new markets for agricultural commodities or trends in urban development.

A number of papers in the special issue provide insights on a range of processes and factors informing the design of REDD+ architecture. For example, Kanowski et al. (in this issue) argue that there is much to learn from the broader landscape of earlier and current international forestry initiatives and that efforts could also be channeled towards strengthening current norms and organisations, as well as implementing existent forest protection schemes (McDermott et al., 2010). It is indeed commonsensical to look into the barriers to implementation of existent forest protection policies and trying to solve those, before inventing new ones.

These questions are related to the interconnections of the REDD+ international regime, and its related national strategies, with other policies and development processes impacting upon forests and land resources, and more widely driving land-use change. They are also related to policy coordination problems, as well as how well REDD+ contributes to the ultimate goal of the international climate regime from which it evolves. For researchers, these are complex analytical questions related to institutional regimes connections and boundaries, which in turn involve questions regarding responsibilities, roles, obligations and vertical and horizontal integration across scales and governance levels, respectively, as well as across principles, norms and actions of the distinct overlapping regimes (Smouts, 2008).

Establishing the most appropriate finance mechanisms for REDD+ in the future is a central architectural concern. As noted in Section 1, there are different multilateral or country-based funding programmes which are supporting developing countries to draft strategies and develop pilot REDD+ areas. This government-allocated funding is running in parallel to sub-national initiatives led by private/public partnerships and often building upon existing carbon forestry projects already operating in voluntary markets (Cerbu et al., in this issue). None of our contributors focus exclusively on financing issues. However, in the currently published literature, there seem to be three possible pathways. First, there are those who advocate for a fast adoption of carbon markets as key mechanisms to guarantee a relevant demand for REDD+

carbon benefits in the future. Following the CDM example, REDD+ credits would be purchased by governments and private actors to meet their mandatory commitments (the EU has already committed to reduce its emissions by 20% in 2020 and will continue to use the EU ETS as a means to achieve so, even without a post-Kyoto binding agreement) (Butler et al., 2009; Estrada, 2010). The key issue here, however, is whether future REDD+ credits will be eligible under the EU ETS to secure demand or whether, as for the CDM forestry offsets, they will be excluded from allowance markets and demand will therefore be compromised. There are others proposing a phased funding approach, which should initially rely on voluntary multilateral and bilateral funding, then on a COP-mandated fund during the first period of national PAMs implementation, and finally be sustained on carbon trading (Johns et al., 2008; Streck et al., 2009). Finally, there are those who are opposed to the use of carbon markets as a means to finance REDD+, on the basis of the likely economic inefficiency derived from paying for unthreatened forests and the implicit risk of reducing the price of emission permits in the energy and industrial sectors (Karsenty, 2008).

The question of carbon accounting may become a critical architectural element if REDD+ does effectively become a key pillar of a post-2012 international climate change regime. Two contrasting, yet complementary insights on MRV issues are provided by Grainger and Obersteiner (in this issue) and Palmer Fry (in this issue). The former, somewhat controversially, argue that an international REDD+ framework would need to rely on a global network of national carbon assessment, reporting and verification systems operated by governments and coordinated and facilitated by the Group on Earth Observations Forest Carbon Tracking Task, an autonomous science based World Forest Observatory, whose independent information base could also verify national REDD+ reports. Palmer Fry, in line with other scholars (Skutsch et al., 2009), argues that national systems should be built, at least partly, on community-based MRV protocols which maximise the involvement of local people in forest monitoring and the assessment of social impacts. He acknowledges, however, that the development of community-based MRV faces a number of challenges, including the harmonisation of forest and carbon data collection across local and international systems and, above all, the recognition of its environmental, economic and social advantages by international and national authorities.

Additional insights on MRV issues are also provided by Hajek et al. (in this issue), who demonstrate through a case study of local REDD+ in Peru the potential for technological and organisational innovation when a diversity of local and international for-profit and not-for-profit actors come together to design and implement a project. Peskett et al. (in this issue) also find that local monitoring can be substantially improved with adequate carbon finance, even if considerable progress needs to be made in balancing the interests of project financiers with those of the communities involved, and in improving policy coordination with existing institutions external to projects.

2.2. Agency of and beyond the state

Agency is a key analytic theme of earth system governance because of the increasingly significant role that non-state

actors are playing in providing governance, oftentimes alongside the nation state. Non-state actors span the entire spectrum from public non-state to public-private to scientific networks to purely private actors. These actors shape policy outcomes and/or set their own rules related to the interactions between humans and their natural environment. As a result, a reconfiguration of authority in the REDD+ regime-building process is taking shape. Here, actors refer to the individuals, communities, organisations and networks that participate in decision-making related to REDD+. Agency may thus arise from the purposeful steering by constituents either directly by making steering decisions or indirectly by influencing the decisions of other actors (Biermann et al., 2009). Constituents can be involved in policy-making by (1) being informed of facts and outcomes; (2) being consulted and invited to provide input or feedback; (3) being involved as a junior partner and ensured that views and concerns are reflected in the outcomes; (4) being invited to collaborate on equal footing; and (5) being empowered and conferred decision-making authority (Schroeder, 2010). In the context of REDD+, there is thus a need to investigate who participates at different levels of governance and how these actors exercise their agency.

This special issue includes a number of papers which directly or indirectly reflect on the question of who actually has agency in shaping REDD+ rules at the top and practices at the bottom, but we acknowledge that more research efforts are required, particularly to understand what economic, socio-political and cultural factors determine effective participation, affect power relations and enable co-production of REDD+ strategies by governments, the private sector and civil society. In Mexico, for example, a participatory network involving civil society organisations, government agencies, and individuals interested in REDD+ has been created to discuss and draft the country's national strategy (www.redd-mexico.org). Meetings and open discussions are held periodically, during which the government receives advice and insights from participants. Although this has been widely welcomed, there is a need to examine which actors do not participate, whose views are sidelined and why. This issue, of course, overlaps with legitimacy questions, such as who is entitled to make decisions in the context of REDD+, and how such entitlement is constituted and respected by others, which we explore further below.

The politics involved in REDD+ strategy framing is taken up by Thompson et al. (in this issue), who propose a framework to align the interests of a wide range of stakeholders, particularly indigenous peoples, to bring about desired environmental outcomes. The authors are particularly critical with the rather top-down participatory approach promoted by international REDD+ readiness funding organisations, including the World Bank Forest Carbon Partnership Facility and the UN-REDD programme, and they warn about the likely marginalisation of regional and local stakeholders, particularly from indigenous peoples organisations. The authors argue that a state-centered design and implementation of REDD+ PAMs is likely to be unsuccessful, insofar as it will lack legitimacy at local level and will suffer from the same enforcement problems characterising the land-use sector in many developing countries. The authors show the rather limited involvement of indigenous peoples in REDD+ international and national negotiations to

date, and cast doubt on assuming a causal relationship between actual participation and the uptake of REDD+ related practices. Similar reflections are made by Lyster (in this issue) when she states that 'it is essential for indigenous peoples and local communities to be able to access information about: where REDD+ sites will be established; who will manage the sites; how they will be impacted by the establishment of sites and the legal obligations which they will have within the sites; what financial benefits will be distributed for managing REDD+ sites; and, importantly, what financial benefits they are likely to receive'.

2.3. Adaptiveness of the REDD+ regime

Adaptiveness addresses social learning and generation of knowledge that are required to tackle global environmental change, in this case deforestation and degradation of global forests. We consider here the governance of adaptation to social-ecological change as well as the processes of change and adaptation within governance systems (Biermann et al., 2010), describing changes made by social groups in response to or in anticipation of challenges created by deforestation and degradation. Hence, we ask: how adaptive is REDD+ to allow it to respond to changes and new findings and developments while remaining stable to ensure its robustness? How does it incorporate learning? What is the preparedness of the REDD+ regime and of the emerging national strategies to deal with unforeseen changes in dynamics around the drivers of deforestation, and unintended consequences from other policy processes or socio-economic goals?

These issues are logically rather unexplored, both in the literature and in our special issue. This can be attributed to the fact that REDD+ is still in its infancy and we still have to witness how the distinct PAMs and projects established deal with changing conditions in the social-including the political- and ecological systems they try to shape. We believe, nonetheless, that Caplow et al.'s (in this issue) contribution raises very important methodological questions about how we should go about researching REDD+ in the future, particularly if we attempt to draw robust conclusions on ecological and social additionality issues. The authors argue that only five of 20 carbon forestry projects operating mostly under the voluntary carbon market, including the Activities Implemented Jointly (AIJ) pilot phase, have undergone a fairly rigorous evaluation of their socioeconomic and biophysical impacts, while many other projects appearing on the UNFCCC AIJ list, for instance, never got started or were terminated prior to substantial implementation. This underscores that the actual extent of learning from these early projects for REDD+ is far below its potential and the authors therefore recommend future evaluations to be constructed upon high quality baseline data for assessing both biophysical and social outcomes at various stages of the project, incorporating counterfactual scenarios. Using mixed methods to understand the process of implementation, its effectiveness, and the causal relationships between interventions and observed outcomes, such as ethnography, participatory rapid appraisal and socioeconomic surveys, could be of immense value (Seymour and Angelsen, 2009).

2.4. Accountability and legitimacy of REDD+

The emergence of new agents in the field of REDD+ calls for a new engagement with questions of accountability and legitimacy 'beyond the ballot box' (Biermann et al., 2010). Legitimacy derives through the accountability of governments to their constituencies as well as through wider public scrutiny and acceptance of decisions and actions, which is referred to as discursive legitimacy (Dryzek, 2001; Biermann et al., 2010). However, legitimacy also concerns the way in which rules and outcomes are negotiated, administered and accepted by stakeholders, including a fair distribution of decision-making power (Paavola, 2003). What are then the sources of accountability and legitimacy of both REDD+ institutional architecture and the agents of REDD+, which are often non-state actors? Is REDD+ transparent enough to ensure not only accountability and legitimacy, but also effectiveness (Gupta, 2008)? Is the balance of interests and perspectives of the various REDD+ stakeholders ensured, from governments to NGOs and the private sector?

These are important questions which are still rather unexplored in the context of REDD+ but have captured increasing attention of scholars working on global environmental and climate governance (Backstrand, 2008; Newell and Paterson, 2010), and on specific policy instruments like the CDM (Corbera et al., 2007; Lövbrand et al., 2009). The former's overarching concern is how we can ensure that the set of governmental and socially-led activities (e.g. unregulated public-private partnerships or exclusively private endeavours) which discursively claim to be tackling a particular environmental problem in the context of a specific regime actually translate in measurable and additional outcomes, and to which extent these activities are founded upon fair and non-exclusionary decisions.

Regarding the former dimension, we have highlighted above the critical role that MRV rules and procedures may play and some papers in this issue examine the opportunities and challenges involved in such procedures, at both technical and political levels. However, such technical and political accountability is related to a cross-cutting theme across REDD+ architectural design and the question of access that we explore below, i.e. the question of compliance and who becomes liable for failing to achieve the regime objectives. Among international relations scholars, there are divergent views on the main drivers of compliance: while some argue that enforcement procedures, including penalties, are key to steer behaviour, others are more inclined to believe that the mainstreaming of the regime's discourse will be sufficient to transform behaviour positively. However, as Young (2002, p. 40) suggests, the real world is probably explained by a middle course, where both authority-sanctioned rules and policy discourses lead towards standard operating practices, which in turn lead towards more or less effective compliance.

In a future UNFCCC REDD+ regime, developing country governments may receive direct incentives and therefore may become liable for future losses of carbon stocks. In some countries sub-national activities' developers may also become relevant beneficiaries with potential liabilities, all depending on the future rules governing the regime both internationally and nationally. In any case, national PAMs are likely to be

diverse and may or may not involve civil society actors like NGOs, private companies or rural communities. If a government considers using PES to reduce deforestation and degradation, one should interrogate which mechanisms (if any) are put in place to explain compliance rules and transpose liabilities to local actors, as well as in which cases there are sanctioning exceptions for non-delivery of expected outcomes. In this regard, one of us has argued elsewhere that PAMs and sub-national REDD+ activities may be characterised by the co-existence of state and community-based authorities in the regulation and sanctioning of natural resource management practices, which can in turn influence how conflicts are dealt in practice, potentially compromising the effectiveness of the formal procedures against non-delivery of carbon benefits based on the judiciary (Corbera et al., 2010b).

From a legitimacy perspective, efforts at the COP level to ensure that REDD+ procedural rules recognise developing country obligations to involve national stakeholders, and particularly indigenous peoples, in defining REDD+ PAMs have been adopted. Lyster (in this issue), for example, shows that while the June 2010 REDD+ Advance Negotiating Text was 'groundbreaking' for including references to the rights of indigenous peoples and local communities, the implementation of these rights requires commitment by individual tropical forest countries to the legal and governance reforms needed. At national and local levels, we believe that Lövbrand et al.'s (2009) analysis of the CDM, based on input and output legitimacy,² can inform future examinations of REDD+ strategies and specific actions. They show the existing tensions between the production of additional and cost-effective carbon reductions and the way in which project developers reduce consultations and centralise decision-making to reduce the increasing costs of participation, which we believe can also characterise REDD+ programmes and projects (see Peskett et al., in this issue).

2.5. Allocation and access to REDD+

We turn now to the issue of fair allocation and access and the un-doing of perceived injustices which, in the context of REDD+, some scholars have identified as potentially significant (Lovera, 2009). Here, we raise the question of what the overarching principles that underlie allocation and access are in the case of REDD+. This is pertinent in view of the unequal distribution of environmental risks across peoples and places and of the unequal power bases of different stakeholders, both at the level of nation-states and within states. There are a number of moral and ethical issues regarding REDD+ that require attention. They include whether the distribution mechanism under REDD+ would reach all those who have contributed to preserving forests; how forest and indigenous communities who may not enjoy secure tenure rights can trust that they will be duly compensated for their efforts under REDD+; and what the social and environmental safeguards under REDD+ are.

² The authors define input legitimacy as 'the democratic quality of the rule-making process' (ibid.: 77) and its output dimension as 'the ability of rulemakers to produce outcomes that achieve collective goals and solve problems' (ibid.).

Emerging REDD+ scholarly debates suggest potential trade-offs across efficiency, effectiveness, equity and legitimacy in the allocation of REDD+ investment and incentives (Putz and Redford, 2009; Gregersen et al., 2010), as has occurred in the context of PES (Muradian et al., 2010). For example, Cerbu et al. (in this issue) review 79 REDD+ readiness activities and 100 REDD+ demonstration activities developed as of October 2009 and show an uneven distribution of activities across tropical countries. They highlight that the largest share of REDD readiness and demonstration activities were implemented in Indonesia and Brazil, which is in turn related to these countries' greatest forest-based emission reduction potential. They also show that five national characteristics have significant effects on the number of REDD demonstration projects, namely the country's land-use related historical emissions, forest carbon stock changes, number of threatened species, governance institutions, and its regional location, the latter revealing a strong bias against African countries.

At national level, developing country governments will need to decide where to allocate often scarce organisational and financial efforts to achieve emission reductions with the potentially highest success rate at the minimum cost, with subsequent environmental, social and political ramifications. Some suggest that the most useful regulatory and financial government efforts should be put to halt deforestation and degradation processes in agricultural development frontiers (e.g. removing agricultural and cattle rearing subsidies), which could render higher carbon benefits per unit of investment, while promoting better sustainable forest management across the private and social sectors and in some cases contribute substantially to biodiversity conservation (Venter et al., 2009). This approach raises questions about the fairness of providing incentives to powerful actors, such as logging companies, but underscores the importance of dedicating efforts to revert negative environmental practices. Others, nonetheless, are inclined to favour compensation mechanisms which reward forest stewards for their historical and present conservation efforts even if their forests are not necessarily degraded or at risk of being converted, such as in large indigenous territories, while respecting their traditional resource management practices and institutions (van Dam, 2010).

These reflections relate to how REDD+ incentives should be made available to local actors, and particularly to remote and poor rural communities, and to which extent such payments can foster existing inequities. Skutsch et al. (in this issue) allude to a number of challenges in this regard and offer recommendations. Where tenure and management rights over community forests are unclear, this may act as a disincentive for communities to sustainably manage their forests under REDD+. Where ownership of carbon credits generated by community forest management activities is unclear and where state governments would be able to appropriate them, the authors see the need for legislation clarifying questions of ownership of carbon credits, an approach which remains rare in many countries to date (Corbera et al., 2010b). Ezzine de Blas et al. (in this issue) also analyse possible economic compensation scenarios for avoided deforestation in Brazilian land reform settlements, and highlight that the latter's engagement with REDD+ will strongly depend on the existing revenues derived from land-

use change (i.e. whether compensation payments can cover opportunity costs), but also on forest resource availability and people's existing involvement in timber and sustainable forest management operations. Seemingly, Peskett et al. (in this issue) note a few contextual issues which may influence actors' agency and their future welfare in REDD+ affected territories, including existing patriarchal structures which constrain women's involvement in project design and implementation.

3. Future research on REDD+ governance and implementation

This editorial has highlighted the critical dimensions of REDD+ design and implementation building upon the earth system governance framework. The papers that follow contribute to different extents and depths to some or at least one of the dimensions highlighted, although we are aware that many areas would have required attention in additional papers. Nonetheless, we believe that the framework presented above has allowed us to identify three main clusters for future research.

3.1. The politics of REDD+ at international and national levels

A key aspect lacking empirical research by international relations and political science scholars relate to how decisions regarding REDD+ architecture have evolved and been made at the international level in the context of the post-2012 negotiations. There have been examinations of how and why the idea of avoided deforestation as a means to tackle climate change was taken up by Parties to the UNFCCC and other actors (Humphreys, 2006) but analyses of how different actors' interests are currently shaping REDD+ negotiations in the UNFCCC context, the emergence of multilateral and bilateral finance and capacity-building initiatives, and how such processes are influenced by other aspects of post-Kyoto negotiations remain largely unexplored (for an analysis of this kind, focusing on the CDM afforestation and reforestation rules, see Boyd et al., 2008, or for an analysis of the role of indigenous peoples in the UNFCCC process, see Schroeder, 2010). We believe that such an effort will provide, for example, an understanding of why the "the second D" and the "+" were incorporated to the original RED acronym, the future role and evolution of carbon markets and the commitments acquired (or not) by the United States and other developing countries. Are there other reasons beyond their potential mitigation contribution which could explain the impetus and inclusion of REDD+ activities under the UNFCCC? What are the views of different government and civil society actors regarding REDD+, how have they changed and how have they evolved during the negotiations since 2005?

These questions related to the international level are also pertinent at the national level. Since 2007, many developing country governments have been developing their national strategies with the support of multilateral agencies and other developed countries. Beyond some preliminary analyses of emerging national strategies, more needs to be documented in

the literature about how governments are designing such strategies, what degree of coordination and reform across policies and sectors is being sought and achieved and how different government and non-governmental actors are being involved in such discussions, and why. In this regard, our own experience suggests that countries have to date had very divergent approaches to this issue (e.g. the experience of Mexico highlighted above is rather unique in Latin America, at least to date) and that there are very different responses to REDD+ by civil society in developing countries.

Some tropical countries and a number of civil society and indigenous peoples organisations are wary of the development of REDD+ related measures in their countries, and therefore oppose any possible government or privately-led actions in this direction (Seymour, 2008; Okereke and Dooley, 2010). However, some have already reversed their position in the face of incorporating social and environmental safeguards into the post-2012 agreement. The question then is what are the discourses and rationales being contested and constructed at national level, which of them permeate policy decisions and statements, and why this is the case. How are competing views on REDD+ within governments and across civil society likely to affect the efficiency, effectiveness, equity and legitimacy of REDD+?

3.2. *Interplay between REDD+ and other policies and market processes in the land-use sector*

The question of vertical and horizontal interplay constitutes a central variable in understanding the future effectiveness of the REDD+ regime. Cowie et al. (2007) have already shown the likely synergies and trade-offs across the conventions on climate change, biological diversity and combating desertification in the context of land-use change and forestry procedural recommendations and assessment guidelines. A next step would be to investigate existing synergies and contradictions across land-use management policies at national level, including conservation strategies, agricultural and urban development. Their examination in the evolving context of REDD+ policies and actions should be undertaken through a broad analytical framework which, on the one hand, considers organisational, mandatory and political issues across government departments and economic sectors and, on the other, is sensitive to the power constellations which underpin the relations of those actors involved in land-use management, as well as their use of legitimate and illegal forms of exercising authority. There is a need to examine whether REDD+ is able to transcend forest sector regulations, based on cross-sectoral and coordinated policy bodies and, more importantly, on the development of coordinated – rather than contradictory – development and land-use planning policies, but also to conduct an in-depth examination of how policies and actions unfold in local contexts, through existing commercial networks, extension services and both legal and illegal markets for natural resources.

The interplay of REDD+ and development goals, poverty alleviation, economic growth and the drivers of deforestation is also insufficiently understood, as are the impacts from PES schemes on local livelihoods and local communities. REDD+ is currently fragmented vertically and horizontally, given the

absence of a single, formal international mechanism. To what extent does fragmentation and decentralisation benefit or disadvantage weaker actors?

3.3. *REDD+ design, PAMs and implementation*

As highlighted throughout this paper, some of the contributions to the special issue draw attention to the diversity of institutional arrangements, the diversity of actors and the diverse conditions for participation and power relations across geographical scales, and the need to better understand the diverse actors, rules and links to existing institutions for the design process of REDD+. However, following Kanowski et al. (in this issue), we believe that more research on the emerging PAMs, pilot programmes and activities is required, given that approaches need to be locally appropriate but can draw relevant lessons for the future (Brown et al., 2008). Successes in community forest management (Agrawal and Angelsen, 2009) and in addressing illegal logging (Tacconi, 2007) offer examples relevant to REDD+ implementation and there is also a lot to learn from current failures in international forest governance (Humphreys, 2006; McDermott et al., 2010), as well as to understand how we could build on existing international and national institutions for forest governance to mainstream REDD+ quicker and more effectively in those interested nations.

In the context of planned and early pilot activities, we suggest there is a need to understand, on the one hand, how national PAMs to address deforestation, degradation and enhancing forest carbon stocks transform practices, institutions, and livelihoods, particularly any existing 'bundles of rights' over land and forest resources (Corbera et al., 2010b). On the other, there is a need to conduct ecological assessments of how landscapes and forest resources will change as a result of any new implemented PAMs and the latter's effect on ecological diversity and resilience. In this regard, we believe that Caplow et al.'s contribution provides very useful guidance, although it also clearly shown that robust, holistic and interdisciplinary REDD+ research may be costly and time consuming. However, as these authors rightly suggest, understanding the interplay between co-benefits and carbon benefits is essential to learning how to implement sub-national REDD+ that will deliver on the promise of incentive-based GHG emissions reductions with favourable poverty and biodiversity co-benefits.

Finally, finding the most adequate and context-specific approaches to harmonising local approaches to monitor forest cover and changes in carbon stocks with the IPCC guidance and guidelines, as suggested by Decision 4/CP.15, is likely to be challenging national and international guidelines for carbon assessment (De Fries et al., 2007). Palmer Fry (in this issue) finds that skepticism towards locally-based monitoring is still prevalent in governmental, non-governmental and private sectors. This could be rectified through more quantitative studies that verify the quality of the locally produced data compared with professionally derived data. Palmer Fry also identifies the need to explore the potential of locally-based monitoring to track social impacts, especially since it would be a central MRV requirement for REDD+. Furthermore, studies need to confirm that locally produced data can genuinely feed

into a global system, and that barriers to this information transfer can be overcome. Particularly, these concern institutional deficiencies in many developing countries and formatting differences between locally-produced data and an international system that is accustomed to receiving scientific data sets from professionals. To conclude, we hope to have provided a relevant framework for framing and understanding the present and future of REDD+ through a governance lens, reflecting on its evolving architectural elements, the agency of multiple actors in a diverse REDD+ landscape, and shedding light on the future challenges and opportunities of REDD+ across policy and implementation scales for both the environment and land-use managers. We also expect to have highlighted relevant entry points for a REDD+ research agenda which is both scientific and politically relevant. Urgent questions in the wake of operationalising REDD+ are waiting to be answered.

REFERENCES

- Agrawal, A., Angelsen, A., 2009. Using community forest management to achieve REDD+ goals. In: Angelsen, A. (Ed.), *Realising REDD+*. Centre for International Forestry Research, Bogor, pp. 201–212.
- Angelsen, A. (Ed.), 2009a. *Realising REDD+: National Strategy and Policy Options*. Center for International Forestry Research, Bogor.
- Angelsen, A., 2009b. Policy options to reduce deforestation. In: Angelsen, A. (Ed.), *Realising REDD+: National Strategy and Policy Options*. Center for International Forestry Research, Bogor, pp. 125–138.
- Backstrand, K., 2008. Accountability of networked climate governance: the rise of transnational climate partnerships. *Global Environmental Politics* 8 (3), 74–102.
- Biermann, F., Betsill, M., Gupta, J., Kanie, N., Lebel, L., Liverman, D., Schroeder, H., Siebenhuener, B., 2009. *Earth System Governance: People, Places and the Planet*. Science and Implementation Plan of the Earth System Governance Project. Earth System Governance Report 1, IHDP Report 20, Bonn, IHDP.
- Biermann, F., Betsill, M., Camargo Vieira, S., Gupta, J., Kanie, N., Lebel, L., Liverman, D., Schroeder, H., Siebenhuener, B., Zanda, P., Zondervan, R., 2010. Navigating the anthropocene: the Earth System Governance Project strategy paper. *Current Opinion in Environmental Sustainability*, doi:10.1016/j.cosust.2010.04.005.
- Boyd, E., Corbera, E., Estrada, M., 2008. UNFCCC negotiations (pre-Kyoto to COP-9): what the process says about the politics of CDM-sinks. *International Environmental Agreements: Politics, Law and Economics* 8, 95–112.
- Brown, D., Seymour, F., Peskett, L., 2008. How do we achieve REDD co-benefits and avoid doing harm? In: Angelsen, A. (Ed.), *Moving Ahead With REDD*. Centre for International Forestry Research, Bogor, pp. 107–118.
- Bulkeley, H., Newell, P., 2010. *Governing Climate Change*. Routledge, London and New York.
- Butler, R.A., Pin Koh, L., Ghazoul, J., 2009. REDD in the red: palm oil could undermine carbon payment schemes. *Conservation Letters* 2, 67–73.
- Caplow, S., Jagger, P., Lawlor, K., Sills, E., in this issue. Evaluating land use and livelihood impacts of early 1 forest carbon projects: lessons for learning about REDD+. *Environmental Science and Policy*.
- Cerbu, G.A., Swallow, B.M., Thompson, D.Y., in this issue. Locating REDD: a global survey and analysis of REDD readiness and demonstration activities. *Environmental Science and Policy*.
- Corbera, E., Brown, K., Adger, W.N., 2007. The equity and legitimacy of markets for ecosystem services. *Development and Change* 38 (4), 587–613.
- Corbera, E., Estrada, M., Brown, K., 2009. How do regulated and voluntary carbon-offset schemes compare? *Journal of Integrative Environmental Sciences* 6 (1), 26–50.
- Corbera, E., Estrada, M., Brown, K., 2010a. Reducing greenhouse gas emissions from deforestation in developing countries: revisiting the assumptions. *Climatic Change* 100 (3–4), 355–388.
- Corbera, E., Estrada, M., May, P., Navarro, G., Pacheco, P., 2010b. Rights to forests and carbon. Insights from Mexico, Brazil and Costa Rica. In: Paper Presented at the ‘Oaxaca Workshop on Forest Governance, Decentralisation and REDD+’, Mexico, 31 August–03 September 2010.
- Cowie, A., Schneider, U.A., Montanarella, L., 2007. Potential synergies between existing multilateral environmental agreements in the implementation of land use, land-use change and forestry activities. *Environmental Science and Policy* 10, 335–352.
- Davis, C., Nakhoda, S., Daviet, F., 2010a. A Review of the World Bank Forest Carbon Partnership Facility Readiness Proposals, v.1.3. WRI Working Paper. World Resources Institute.
- Davis, C., Williams, A., Goers, L., Daviet, F., Lupberger, S., 2010b. A Review of the World Bank Forest Carbon Partnership Facility Readiness Proposals, v.1.4.
- De Fries, R., Archard, F., Brown, S., Herold, M., Murdiyarsa, D., Schlamadinger, B., de Souza, C., 2007. Earth observations for estimating greenhouse gas emissions from deforestation in developing countries. *Environmental Science and Policy* 10, 385–394.
- Dryzek, J.S., 2001. Legitimacy and economy in deliberative democracy. *Political Theory* 29, 651–669.
- Estrada, M., 2010. REDD+ much still to be done. *Trading Carbon Magazine* 4 (5), s6–s8.
- Ezzine de Blas, D., Börner, J., Violato Espada, A.L., Nascimento, N., Piketty, M.G., in this issue. Forest loss and management in land reform settlements: implications for REDD governance in the Brazilian Amazon. *Environmental Science and Policy*.
- Forsyth, T., 2009. Multilevel, multiactor governance in REDD+: participation, integration and coordination. In: Angelsen, A. (Ed.), *Realising REDD+: National Strategy and Policy Options*. Center for International Forestry Research, Bogor, pp. 113–124.
- Grainger, A., Obersteiner, M., in this issue. A framework for structuring the global forest monitoring landscape in the REDD-Era. *Environmental Science and Policy*.
- Gregersen, H., El Lakany, H., Karsenty, A., White, A., 2010. Does the Opportunity Cost Approach Indicate the Real Cost of REDD+? Rights and Realities of Paying for REDD+. Rights and Resources Initiative, Washington, DC.
- Gupta, A., 2008. Transparency under scrutiny: information disclosure in global environmental governance. *Global Environmental Politics* 8 (2), 1–7.
- Hajek, F., Scriven, J., Castro, A., Ventresca, M.J., in this issue. Regime-building for REDD+: evidence on anatomy and proximate outcomes from a cluster of local initiatives in south-eastern Peru. *Environmental Science and Policy*.
- Houghton, R., 2005. Tropical deforestation as a source of greenhouse gas emissions. In: Moutinho, P., Schwartzman, S. (Eds.), *Tropical Deforestation and Climate Change*. Belem, IPAM and Environmental Defense.

- Humphreys, D., 2006. Logjam. Deforestation and the Crisis of Global Governance. Earthscan, London.
- Humphreys, D., 2008. The politics of 'Avoided Deforestation': historical context and contemporary issues. *International Forestry Review* 10, 433–442.
- Hyden, G., Mease, K., Foresti, M., Fritz, V., 2008. Governance Assessments for Local Stakeholders: What the World Governance Assessment Offers. Working Paper 287. Overseas Development Institute, London.
- Johns, T., Merry, F., Stickler, C., Nepstad, D., Laporte, N., Goetz, S., 2008. A three-fund approach to incorporating government, public and private forest stewards into a REDD funding mechanism. *International Forestry Review* 10 (3), 458–464.
- Kanowski, P.J., McDermott, C.L., Cashore, B.W., in this issue. Implementing REDD+: lessons from analysis of forest governance. *Environmental Science and Policy*.
- Karsenty, A., 2008. The architecture of proposed REDD schemes after Bali: facing critical choices. *International Forestry Review* 10 (3), 443–457.
- Keohane, R.O., 1982. The demand for international regimes. *International Organization* 36 (2), 325–355.
- Larson, A., Petkova, E., 2010. Synergies and opportunities. An introduction to forest governance, people and REDD+ in Latin America. In: Paper Presented at the 'Oaxaca Workshop on Forest Governance, Decentralisation and REDD+', Mexico, 31 August–03 September 2010.
- Le Quéré, C., Raupach, M., CANADELL, J., Marland, G., et al., 2009. Trends in the sources and sinks of carbon dioxide. *Nature Geoscience* 2, 831–836.
- Lövbrand, E., Rindeljäll, T., Nordqvist, J., 2009. Closing the legitimacy gap in global environmental governance? Lessons from the emerging CDM market. *Global Environmental Politics* 9 (2), 74–100.
- Lovera, S., 2009. REDD realities. In: Brand, U., Bullard, N., Lander, E., Müller, T. (Eds.), *Contours of Climate Justice: Ideas for Shaping New Climate and Energy Politics*. Dag Hammarskjöld Foundation, Germany, pp. 46–53.
- Lyster M., in this issue. REDD+, transparency, participation and resource rights: the role of law. *Environmental Science and Policy*.
- McDermott, C.L., Cashore, B., Kanowski, P., 2010. Global Environmental Forest Policies. An International Comparison, Earthscan, London.
- Melick, D., 2010. Credibility of REDD and experiences from Papua New Guinea. *Conservation Biology* 24 (2), 359–361.
- Muradian, R., Corbera, E., Pascual, U., Kosoy, N., May, P., 2010. Reconciling theory and practice: an alternative conceptual framework for understanding payments for environmental services. *Ecological Economics* 69 (6), 1202–1208.
- Nasi, R., Putz, F.E., Pacheco, P., 2010. Sustainable forest management, biodiversity and carbon. In: Paper Presented at the 'Oaxaca Workshop on Forest Governance, Decentralisation and REDD+', Mexico, 31 August–03 September 2010.
- Newell, P., Paterson, M., 2010. Climate Capitalism. Global Warming and the Transformation of the Global Economy. Cambridge University Press, Cambridge and New York.
- Okereke, C., Dooley, K., 2010. Principles of justice in proposals and policy approaches to avoided deforestation: towards a post-Kyoto climate agreement. *Global Environmental Change* 20, 82–95.
- Paavola, J., 2003. Environmental Justice and Governance: Theory and Lessons from the Implementation of the European Union's Habitat Directive. Working Paper EDM 03-05. Centre for Social and Economic Research on the Global Environment, Norwich.
- Palmer Fry, B., in this issue. Locally-based monitoring – the 'M' in REDD+ MRV. *Environmental Science and Policy*.
- Peskett, L.M., Schreckenberg, K., Brown, J., in this issue. Institutional approaches for carbon financing in the forest sector: learning lessons for REDD+ from forest carbon projects in Uganda. *Environmental Science and Policy*.
- Putz, F.E., Redford, K.H., 2009. Dangers of carbon-based conservation. *Global Environmental Change* 19, 400–401.
- Ramsteiner, E., 2009. Governance concepts and their application in forest policy initiatives from global to local levels. *Small-scale Forestry* 8, 143–158.
- Reed, D., 2010. A Registry Approach for REDD+. The REDD Desk. Available at: http://www.theredddesk.org/sites/default/files/resources/pdf/2010/Registry_Approach_for_REDD.pdf.
- Rockström, J., Steffen, W., Noone, K., Persson, A., Stuart Chapin, F., Lambin, E.F., Lenton, T.M., Scheffer, M., Folke, C., Schellnhuber, H.J., Nykvist, B., de Wit, C.A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P.K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V.J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P., Foley, J.A., 2009. A safe operating space for humanity. *Nature* 461, 472–475.
- Schroeder, H., 2010. Agency in International Climate Negotiations: The case of indigenous peoples and a) voided deforestation. *International Environmental Agreements: Politics, Law and Economics* 10 (4), 317–332, doi:10.1007/s10784-010-9138-2.
- Seymour, F., 2008. Forests, Climate Change and Human Rights: Managing Risk and Tradeoffs. Center for International Forestry Research, Bogor.
- Seymour, F., Angelsen, A., 2009. Summary and conclusions: REDD wine in old wineskins? In: Angelsen, A. (Ed.), *Realising REDD+*. Centre for International Forestry Research, Bogor, pp. 293–304.
- Skutch, M., Van Laake, P.E., 2009. REDD as multi-level governance in the making. *Energy and Environment* 19 (6), 831–844.
- Skutsch, M., McCall, M.K., Karky, B., Zahabu, E., Peters-Guarin, G., 2009. Case studies on measuring and assessing forest degradation: community measurement of carbon stock change for REDD. Working Paper 156. FAO Forest Resources Assessment, Rome.
- Skutsch, M., Vickers, B., McCall, M.K., in this issue. Alternative models for carbon payments to communities under REDD+: A comparison using the Polis model of actor inducements.
- Smuts, M.C., 2008. The issue of an international forest regime. *International Forestry Review* 10 (3), 429–432.
- Streck, C., Gómez-Echeverri, L., Gutman, P., Loisel, C., Werksman, J., 2009. REDD+ insitutional options assessment. A report prepared by the Meridian Institute for the Government of Norway.
- Tacconi, L., 2007. Illegal logging and the future of the forest. In: Tacconi, L. (Ed.), *Illegal Logging*. Earthscan, London, pp. 275–290.
- Tacconi, L., Downs, F., Larmour, P., 2009. Anti-corruption policies in the forest sector and REDD+. In: Angelsen, A. (Ed.), *Realising REDD+: National Strategy and Policy Options*. Center for International Forestry Research, Bogor, pp. 163–174.
- Thompson, M.C., Baruah, M., Carr, E.R., in this issue. Seeing REDD+ as a Project of Environmental Governance. *Environmental Science and Policy*.
- van Dam, C., 2010. Indigenous territories and REDD in Latin America. Opportunity or threat? In: Paper Presented at the 'Oaxaca Workshop on Forest Governance, Decentralisation and REDD+', Mexico, 31 August–03 September 2010.
- Venter, O., Meijaard, E., Possingham, H., Dennis, R., Shiel, D., Wich, S., Hovani, L., Wilson, K., 2009. Carbon payments as a safeguard for threatened tropical mammals. *Conservation Letters* 2, 123–129.

Young, O., 1986. International regimes: toward a new theory of institutions. *World Politics* 39 (1), 104–122.

Young, O., 2002. *The Institutional Dimensions of Environmental Change. Fit, Interplay, and Scale*. The MIT Press, Cambridge and London.

Young, O., King, L., Schroeder, H., 2008. *Institutions and Environmental Change*. MIT Press, Cambridge, MA.

Esteve Corbera is a Senior Research Associate at the School of International Development, University of East Anglia, and a ‘Ramón y Cajal’ fellow at the Institute for Environmental Science and Technology, Autonomous University of Barcelona. His research interests lie in the governance of clean development and land-use management, including analyses of carbon offset pro-

jects and payments for environmental services. He has been appointed as a Lead Author for Working Group III of the IPCC 5th Assessment Report.

Heike Schroeder is a James Martin Senior Research Fellow at the Environmental Change Institute, School of Geography and the Environment, University of Oxford. She is also the coordinator of the governance theme in the Tyndall Centre for Climate Change Research and a member of the Scientific Steering Committee of the Earth System Governance Project under the International Human Dimensions Programme on Global Environmental Change (IHDP). Her research interests include multilevel governance and institutions, the international climate change negotiations, urban climate change governance and forest governance.