Forest Rights: The Hard Currency of REDD+

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Abstract

One of the proposed strategies for implementation of reducing emissions from deforestation and forest degradation plus (REDD+) is to incentivize conservation of forests managed by communities under decentralized forest management. Yet, we argue that this is a challenging road to REDD+ because of three general characteristics of forests under existing decentralized management regimes. First, these forests already accumulate biomass and, in some cases, generate leakage, which threatens to undercut REDD+ additionality. Second, these forests are many and small, which will drive up REDD+ transactions costs. Third, beyond the "conservation islands" represented by forests under decentralized management, processes of deforestation and forest degradation continue. Given these challenges, we argue that REDD+ efforts through decentralized forestry should be redirected from incentivizing further conservation of forests under existing decentralized management arrangements toward a push for extending the coverage of forests under decentralized management, making forest rights the hard currency of REDD+.

Introduction

REDD+ broadly denotes policies and interventions aiming to mitigate climate change through reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries. The underlying notion is that by creating financial value for forest-based carbon, actors managing forests in developing countries will perceive an incentive to reduce emissions from forested lands. REDD+ continues to be negotiated under the United Nations Framework Convention on Climate Change's post-Kyoto agreements. Currently, ongoing REDD+ readiness activities and pilot projects are financed mainly through bilateral and multilateral arrangements, the latter including the World Bank's Forest Carbon Partnership Facility and the United Nations (UN)-REDD Program.

In developing countries with existing decentralized forest management policies, the introduction of REDD+ has implied a focus on incentivizing further conservation of forests under decentralized management. This is reflected in, among other, the REDD+ policies and pilot projects of Nepal (GoN 2010), the Philippines (Phelps 2010), Tanzania (UN-REDD Programme 2009), Mexico (UN-REDD Programme 2012), Ethiopia (The REDD Desk 2013), and Cambodia (Lang 2013). In Tanzania, for instance, six of the nine REDD+ pilot projects directly work with incentivizing conservation by communities or preparing communities to receive incentives (TNRF 2011). Furthermore, an inventory of first generation REDD+ projects in Indonesia (35 projects), Brazil (20 projects), and the Democratic Republic of Congo (4 projects), shows as a common pattern that proponents are developing REDD+ pilot projects in forests where they previously ran various forms of conservation-oriented projects, including decentralized management (Sills *et al.* 2009). Similarly, forests under decentralized management contribute to the voluntary carbon offsetting market (Vickers *et al.* 2012). An example is a REDD project in Oddar Meanchey province in Cambodia that was set up in 2008 linking 13 existing community forests covering a total of 67,783 ha with the voluntary carbon market and a private company is marketing carbon

projects generated by this project (Lang 2013). Another example is the Kasigau Corridor REDD+ project that has gained a Verified Carbon Standard (VCS) validation for its forest conservation and regeneration activities on land owned by indigenous community ownership groups in a wildlife corridor between the Tsavo East and Tsavo West National Parks in Kenya (Wildlife Works 2013).

Thus, it seems reasonable to argue that in countries with decentralized forest management policies, REDD+, in policy and not least practice as evidenced in a host of pilot projects, focuses on incentivizing conservation in existing forests under decentralized management. Yet, this specific focus, as it appears currently, has challenges, which we will demonstrate below, and should, in our view, give way to a focus on rights-oriented reforms.

The merits of decentralized forest management

Decentralized forest management denotes the entrustment of powers over forest resources to a local representative authority. Urged forward by promises of effective and equitable conservation, decentralization has spread over the past three decades through legal reforms and implementation efforts and today around 9–10% of the World's total forest area is formally owned by communities and indigenous groups, whereas these groups have formal user rights to another 2–3% (Sunderlin *et al.* 2008). However, there is variation in extent of powers devolved, local enforcement, forest types and sizes, and coverage of decentralized management between countries (Balooni & Inoue 2007; Agrawal *et al.* 2008; Ribot *et al.* 2010).

There is substantial evidence that forests under decentralized management are indeed conserved, irrespective of continent, country, and forest type and size (Nagendra 2007; Somanathan *et al.* 2009; Bowler *et al.* 2012). Decentralized forest management is associated with improving forest conditions measured in terms of tree species diversity, crown cover, volume of trees per ha, tree density, and basal area (Bowler *et al.* 2012). Such outcomes are attributed to higher levels of local enforcement (Chhatre & Agrawal 2008) and monitoring (Nagendra 2007) of forests under decentralized management. In terms of livelihood benefits, the other major policy goal of decentralized forest management, the evidence is more mixed, albeit with a tendency toward negative livelihood outcomes, in particular for poor and forest-dependent community members (Adhikari 2005; Vyamana 2009; Ribot *et al.* 2010).

Overall, it seems reasonable to argue that decentralized forest management has delivered on its promises, in particular on forest conservation. However, despite this, progress on implementation has been slow. Even though at least 35 developing countries have formal policies on decentralized forestry, only a handful has seen large-scale implementation in recent decades, i.e., Nepal, India, and Tanzania. Furthermore, an assessment of forest tenure reforms showed that a mere eight countries (Australia, Bolivia, Brazil, Cameroon, Colombia, India, Sudan, and Tanzania) accounted for almost the entire increase in the forest area formally designated for and owned by communities and indigenous people between 2002 and 2008 (Sunderlin *et al.* 2008).

The three challenges

Ironically, the conservation success of decentralized forest management reviewed above constitutes the first challenge to the strategy of REDD+ through incentivizing further conservation of forests under such management regimes. Ensuring REDD+ additionality will be challenging in forests that are already being conserved. This issue of additionality is underlined by the problem of leakage. The conservation of forests under decentralized management owes a lot to improved forest replenishment and management that have increased forest growth such as tree planting and tending in, e.g., Nepal and India (Kauppi *et al.* 2006) and substitution and reduced consumption of forest products among forest-dependent people (Edmonds 2002; Lund & Treue 2008; Chhatre & Agrawal 2009). However, studies have found that, in many, yet not all (Baland *et al.* 2010), contexts, the conservation of forests under decentralized management is also due to displacement of forest clearance and forest products extraction to other forests, i.e., leakage (Chakraborty 2001; Pokharel & Nurse 2004; Vyamana 2009; Robinson & Lokina (2011)). Such leakage is a well-known phenomenon from other area-based policy tools directed at sustainable management and conservation of forests, such as protected areas (Fearnside 2009; Pfeifer *et al.* 2012) and forest concessions (Resosudarmo 2004; Oliveira *et al.* 2007). Leakage has also been observed in the first community-level forest-based carbon mitigation project in Mozambique (Jindal *et al.* 2012) and a REDD pilot scheme implemented through community-based forest management in Tanzania (Robinson *et al.* 2013). Such leakage is expected, as decentralization, and other area-based initiatives aimed at conservation and sustainable management, confers upon communities and other actors the rights to conserve and manage some, but not all, forests. Furthermore, leakage does not undermine the goals of area-based conservation, when concerned with the preservation of place-specific ecosystem values or services, e.g., water catchments, wildlife species, or biodiversity. Yet, leakage is a serious problem for REDD+ as

it undermines additionality. This is the first challenge to REDD+ through incentivizing conservation of forests under existing decentralized management regimes.

The second challenge concerns size. As carbon sequestration is a global public good, REDD+ should arguably focus on protective measures that can assure large emissions reductions to ensure efficiency, irrespective of where this takes place. To this end, forests under decentralized management, being generally many and small in size, seem ill suited (Table 1). In Nepal, for instance, 17,685 forest user groups manage 1.6 m ha of forest, implying that the average size of a decentralized forest is less than 100 ha. In Mexico, another prime forest decentralization country, some 8,400 land owning *Ejidos* manage around 45 m ha of forest, implying an average forest size of 5,400 ha. Similarly, the 152 forest commons from nine countries analyzed by Chhatre & Agrawal (2008) feature an average forest size of 1,280 ha. Comparing these forest areas to the scale of global deforestation indicates a magnitude of difference in scale that appears relevant to the global scope of REDD+ policy. In Brazil, for instance, an estimated 200,000 ha was deforested from August 2011 to July 2012, down from 270,000 ha the year before (Vaughan 2012). Making REDD+ agreements with forestry user groups in Nepal would entail transacting with more than 2,000 groups in order to merely cover 200,000 ha. A recent review of 27 REDD+ projects located in four continents underlines our point. Of the 27 projects, the larger were areas under State management, mid-size projects were timber concessions and private and indigenous reserves, and the (one-third of 27) projects smaller than 10,000 ha were for areas under individual household or community tenure, and in these the project proponents bundled many households/communities under a single project to increase the scale (IGES 2013).

Given their small-scale nature, implementation of policies to incentivize further conservation of existing decentralized forests is likely to result in limited carbon mitigation at high cost. Evidence on the potential transactions costs of REDD+ implementation remains limited (Fisher *et al*. 2011; Thompson *et al.* 2013), but it seems evident that working with many and small collectively organized recipients of payments will drive up transactions costs per ton of CO_2 sequestered. Agrawal & Angelsen (2009:206) argue that as "the amount of carbon sequestered through any single community-based REDD+ project is likely to be small, cost-effective technologies to monitor community forest carbon are critical to ensure the success of REDD+ community projects." Community-based monitoring approaches have been highlighted as cost-effective in the context of community-based forest management activities under the Clean Development Mechanism (Skutsch 2005) as well as REDD+ (Larrazábal *et al.* 2012; Pratihast *et al.* 2013). Yet, in our view, the optimism displayed in these studies should be tempered by the incentive problems associated with asking communities to surrender information, on the basis of which they will receive REDD+ payments. This concern is voiced in a recent study that illustrates how the production and communication of information in a local monitoring system in the context of decentralized forestry is used strategically to gain and maintain access to the benefits of the management (Nielsen & Lund 2012). Furthermore, transactions costs are driven by more than monitoring as indicated by the standard reference to "monitoring, reporting and verification" (MRV) in the REDD+ literature. However, transactions costs associated with payments to communities would also involve regular interactions with individual communities to draw up contracts, settle disputes, and deliver payments, and so forth.

The third challenge concerns what goes on outside the "conservation islands" represented by forests under decentralized management. Globally, the rate of deforestation is decreasing, but remains at a staggering net 13 m ha per year during 2000–2010 (FAO 2010). Interestingly, net deforestation also occurs in the countries that are seen as global leaders in decentralized forest management (Table 1). Nepal, Tanzania, and Mexico have seen net forest losses over the past decade. And while India saw an increase in forest cover by 3 m ha (4.66%) during 2000–2010, this was mainly driven by the establishment of new tree plantations, whereas the existing, natural forest cover was in decline by 1.5–2.7% per year (Puyravaud *et al.* 2010). Arresting net forest loss at the national level appears more urgent for REDD+ than seeking to squeeze out a marginal extra biomass accumulation of forests under existing decentralized management regimes.

Rights as the hard currency of REDD+

The current REDD+ strategy of targeting forests under existing decentralized management, adopted by a number of countries, appears beset with challenges. Forests under decentralized management are already seeing conservation and are, in all likelihood, generating leakage thus challenging REDD+ additionality. Furthermore, they are many and small, and around them deforestation and forest degradation continues.

Why do we then see this focus in REDD+ policy and practice in a number of countries? The answer could be seen in connection to the fact that decentralization efforts have focused on degraded and/or low value forests, i.e., forests that were of little or no interest to powerful actors at the national level (Ribot *et al.* 2006, 2010; Mustalahti & Lund 2010). By targeting these same forests,

Table 1 Statistics from five global leaders in decentralized forestry[a]

Country	Program	Number of decentralized management units	Average forest size per management unit (ha)	Share of total forest area under decentralized management (%)	Annual forest area change rate during 2005–2010 (%)[b]	Change in forest area during 2000–2010 (%)
India	Joint forest management	112,816	218.47	36.02	0.21	4.66
Nepal	Community forestry	17,685	93.45	45.45	0	−6.77
Philippines	Community-based forest management	1,786	907	21.14	0.73	7.7
Mexico	*Ejidos* (local communities)	8,400	5,400.17	70	−0.24	−2.92
Tanzania	Community-based forest management and joint forest management	2,323	1,775.72	12.34	−1.16	−10.77

[a]Data for India are computed and based on FAO (2010) and ICFRE (2010), for Nepal on FAO (2010) and GoN (2011), for the Philippines on FAO (2010) and Phelps (2010), for Mexico on Klooster & Masera (2000) and FAO (2010), and for Tanzania on FAO (2010) and Blomley *et al.* (2011).
[b]Annual rate of gain/loss in percent of the remaining forest area within the period 2005–2010 (FAO 2010).

current REDD+ efforts pose no immediate threats to such actors. Yet, this runs a risk of spelling failure for REDD+ in these countries and leaves the host of communities with no tenure rights to forests disenfranchised. Therefore, we argue that REDD+ efforts in these countries should be redirected toward expanding the area under decentralized forest management, thereby making forest rights the hard currency of REDD+. This could happen through financing of reforms to expand the forest areas under decentralized management, which would allow forest administrations in developing countries to implement existing, well-known policies, for which implementation guidelines and routines are in place. Furthermore, to alleviate transactions costs, adjustments to existing policies could be made; such as giving higher priority to the creation of larger management units, i.e., devolving larger, or several smaller, adjacent, forest areas to one management body. Whether such adjustment would come with a cost in the sense of lower management effectiveness remains an empirical question; while some studies have found an increasing likelihood of conservation with increasing forest area under decentralized management (Chhatre & Agrawal 2009; Persha *et al.* 2011), other studies have not found any relation (Agrawal & Chhatre 2006), or have come to the opposite result (Chhatre & Agrawal 2008). Yet, there are studies from several countries showing that communities are able to conserve larger forest areas (e.g., ancestral forests in the Philippines [Balooni *et al.* 2008; Villamor & Lasco 2009], indigenous and extractive forest reserves in Brazil [Schwartzman *et al.* 2000], and forest-owning *ejidos* in Mexico [Bray *et al.* 2003]).

The relationship between forest size on one hand and management costs and livelihood outcomes on the other has received scant attention in the literature. In their study of the forest revenues of 42 community-forestry user groups from Nepal, Chhetri *et al.* (2012) find no relation between the size of forest area without valuable timber species and revenue income, but a highly significant, positive relation between the size of forest area with valuable timber species and revenue income. They also show that higher revenue income implies a financial surplus above and beyond forest management costs that is invested in locally important public infrastructure and services. Similarly, the study by Persha *et al.* (2011) indicates that larger decentralized forests are more likely to have joint positive outcomes on conservation and livelihoods, in the sense of the share of the community membership that use the forest. In sum, the existing evidence does not allow us to draw clear conclusions about the relationship between size of forest under decentralized management and outcomes, although there are indications that Nepal's community forests could be managed more efficiently under larger management units (Chhetri *et al.* 2012).

A strategy of expanding the area under decentralized forest management and seeking to establish larger management units in the process cannot be the only strategy for REDD+ in the countries mentioned. Some forests will be too remote for community management to make sense. Yet, in Nepal, for instance, only around one-third of the area identified as suitable for community forestry has been handed over (Pokharel *et al.* 2012). Similarly, in Tanzania, less than one-fourth of the more than 10,000 villages in the country are formally involved in decentralized forest management, and only a subset of these have, in fact, had their management rights officially recognized by the relevant authorities (Blomley & Iddi 2009).

We do acknowledge that expansion of the forest area under decentralized management is part and parcel of the vision of REDD+ policy in the countries mentioned in this article. Yet, in current policy and, not least, practice, we see few indications of these visions becoming reality. Furthermore, such expansion was a clear policy ambition already decades ago, at the inception of decentralized forest management. Yet, the history of policy reform and implementation shows that these ambitions were not met (Sunderlin *et al.* 2008). Forest tenure reforms set out in policies and legislation stumbled in implementation as donor interest dissipated and the practical difficulties of seeing through, for instance, processes of land registration as a preparation for forest mapping and titling, became apparent (Doherty & Schroeder 2011). REDD+ risks becoming a tragic, if not farcical, repetition of these draped-over reform attempts. Therefore, we urge the international donor community, NGOs, researchers, communities, governments, and other actors with an interest in REDD+ to use the current momentum and financial muscle to push forward such implementation. Such an approach, where forest rights become the hard currency of REDD+, to us, constitutes the right way forward for REDD+.

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References

Adhikari, B. (2005). Poverty, property rights and collective action: understanding the distributive aspects of common property resource management. *Environ. Dev. Econ.*, **10**, 7-31.

Agrawal, A. & Angelsen, A. (2009). Using community forest management to achieve REDD+ goals. Pages 201-213 in A. Angelsen, M. Brockhaus, M. Kanninen, E. Sills, W.D. Sunderlin, S. Wertz-Kanounnikoff, editors. *Realising REDD+: national strategy and policy options*. CIFOR, Bogor, Indonesia.

Agrawal, A., & Chhatre, A. (2006). Explaining success on the commons: community forest governance in the Indian Himalaya. *World Dev.*, **34**, 149-166.

Agrawal, A., Chhatre, A. & Hardin, R. (2008). Changing governance of the World's forests. *Science*, **320**, 1460-1462.

Baland, J-M., Bardhan, P., Das, A. & Mookherjee, D. (2010). Forests to the people: decentralization and forest degradation in the Indian Himalayas. *World Dev.*, **38**, 1642-1656.

Balooni, K. & Inoue, M. (2007). Decentralized forest management in South and Southeast Asia. *J. For.*, **8**, 414-420.

Balooni, K., Pulhin, J.M. & Inoue, M. (2008). The effectiveness of decentralisation reforms in the Philippines forestry sector. *Geoforum*, **39**, 2122-2131.

Blomley, T. & Iddi, S. (2009). *Participatory forest management in Tanzania 1993–2009: lessons learned and experiences to date*. Ministry of Natural Resources and Tourism, Forestry and Beekeeping Division, Dar es Salaam, Tanzania.

Blomley, T., Lukumbuzya, K. & Brodnig, G. (2011). *Participatory forest management and REDD+ in Tanzania*. World Bank, Washington, D.C.

Bowler, D.E., Buyung-Ali, L.M., Healey, J.R. *et al.* (2012). Does community forest management provide global environmental benefits and improve local welfare? *Front. Ecol. Environ.*, **10**, 29-36.

Bray, D.B., Merino-Pérez, L., Negreros-Castillo, P. *et al.* (2003). Mexico's community-managed forests as a global model for sustainable landscapes. *Conserv. Biol.*, **17**, 672-677.

Chakraborty, R.N. (2001). Stability and outcomes of common property institutions in forestry: evidence from the Terai region of Nepal. *Ecol. Econ.*, **36**, 341-353.

Chhatre, A. & Agrawal, A. (2008). Forest commons and local enforcement. *Proc. Natl. Acad. Sci. USA*, **105**, 13286-13291.

Chhatre, A. & Agrawal, A. (2009). Trade-offs and synergies between carbon storage and livelihood benefits from forest commons. *Proc. Natl. Acad. Sci. USA*, **106**, 17667-17670.

Chhetri, B.B.K., Lund, J.F. & Nielsen, Ø.J. (2012). The public finance potential of community Forestry in Nepal. *Ecol. Econ.*, **73**, 113-121.

Doherty, E. & Schroeder, H. (2011). Forest tenure and multi-level governance in avoiding deforestation under REDD+. *Glob. Environ. Polit.*, **11**, 66-88.

Edmonds, E. (2002). Government initiated community resource management and local resource extraction from Nepal's forests. *J. Dev. Econ.*, **68**, 89-115.

FAO (Food and Agricultural Organization of the United Nations). (2010). *Global forest resources assessment*. FAO, Rome.

Fearnside, P.M. (2009). Carbon benefits from Amazonian forest reserves: leakage accounting and the value of time. *Mitig. Adapt. Strateg. Glob. Change*, **14**, 557-567.

Fisher, B., Lewis, S., Burgess, N.D. *et al.* (2011). Implementation and opportunity costs of reducing deforestation and forest degradation in Tanzania. *Nat. Clim. Chang.*, **1**, 161-164.

GoN (Government of Nepal). (2010). Nepal's readiness preparation proposal REDD 2010–2013. Available from: http://mofsc-redd.gov.np/wp-content/uploads/2013/01/R-PP_Nepal.pdf (visited May 25, 2013).

GoN (Government of Nepal). (2011). Community forestry. Available from: http://dof.gov.np/division/community-forest-division/community-forestry (visited Jun. 30, 2013).

ICFRE (Indian Council of Forestry Research and Education). (2010). *Forest sector report India 2010*. ICFRE, Dehradun, India.

IGES (Institute for Global Environmental Strategies). (2013). *REDD +projects: a review of selected REDD+ project designs*. IGES Policy Report No. 2012-10, IGES, Kanagawa, Japan.

Jindal, R., Kerr, J.M. & Carter, S. (2012). Reducing poverty through carbon forestry? Impacts of the N'hambita community carbon project in Mozambique. *World Dev.*, **40**, 2123-2135.

Kauppi, P.K., Ausubel, J.H., Fang, J. *et al*. (2006). Returning forests analyzed with forest identity. *Proc. Natl. Acad. Sci. USA*, **103**, 17574-17579.

Klooster, D. & Masera, O. (2000). Community forest management in Mexico: carbon mitigation and biodiversity conservation through rural development. *Glob. Environ. Change*, **10**, 259-272.

Lang, C. (2013). Geographies of evasion: the case of the Oddar Meanchey REDD project in Cambodia. Available from: http://www.redd-monitor.org/2013/01/11/geographies-of-evasion-the-case-of-the-oddar-meanchey-redd-project-in-cambodia./ (visited Aug. 26, 2013).

Larrazábal, A., McCall, M.K., Mwampamba, T.H. & Skutsch, M. (2012). The role of community carbon monitoring for REDD+: a review of experiences. *Curr. Opin. Environ. Sustain.*, **4**, 707-716.

Lund, J.F. & Treue, T. (2008). Are we getting there? Evidence of decentralized forest management from the Tanzanian Miombo woodlands. *World Dev.*, **36**, 2780-2800.

Mustalahti, I. & Lund, J.F. (2010). Where and how can participatory forest management succeed? Learning from Tanzania, Mozambique, and Laos. *Soc. Nat. Resour.*, **23**, 31-44.

Nagendra, H. (2007). Drivers of reforestation in human-dominated forests. *Proc. Natl. Acad. Sci. USA*, **104**, 15218-15223.

Nielsen, M.R. & Lund, J.F. (2012). Seeing white elephants? Production and communication of information in a locally-based monitoring scheme in Tanzania. *Conserv. Soc.*, **10**, 1-14.

Oliveira, P.J.C., Asner, G.P., Knapp, D.E. *et al*. (2007). Land-use allocation protects the Peruvian Amazon. *Science*, **317**, 1233-1236.

Persha, L., Agrawal, A. & Chhatre, A. (2011). Social and ecological synergy: local rulemaking, forest livelihoods, and biodiversity conservation. *Science*, **331**, 1606-1608.

Pfeifer, M., Burgess, N.D., Swetnam, R.D. *et al*. (2012). Protected areas: mixed success in conserving East Africa's evergreen forests. *PLoS One*, **7**, e39337.

Phelps, J., editor. (2010). The Philippine REDD-plus strategy. Available from: http://www.forestcarbonasia.org/other-publications/the-philippine-national-redd-plus-strategy./ (visited Sept. 8, 2013).

Pokharel, B. & Nurse, M. (2004). Forests and people's livelihood: benefiting the poor from community forestry. *J. For. Liveli.*, **4**, 19-29.

Pokharel, R.K., Rayamajhi, S. & Tiwari, K.R. (2012). Nepal's community forestry: need of better governance. Pages 43–58 in C.A. Okia, editor. *Global perspectives on sustainable forest management*. InTech, Shanghai, China.

Pratihast, A.K., Herold, M., De Sy, V., Murdiyaso, D. & Skutsch, M.D. (2013). Linking community-based and national REDD+ monitoring: a review of the potential. *Carbon Manag.*, **4**, 91-104.

Puyravaud, J-P., Davidar, P. & Laurance, W.F. (2010). Cryptic destruction of India's native forests. *Conserv. Lett.*, **3**, 390-394.

Resosudarmo, I.A.P. (2004). Closer to people and trees: will decentralisation work for the people and the forests of Indonesia? *Eur. J. Dev. Res.*, **16**, 110-132.

Ribot, J.C., Agrawal, A. & Larson, A.M. (2006). Recentralizing while decentralizing: how national governments reappropriate forest resources. *World Dev.*, **34**, 1864-1886.

Ribot, J.C., Treue, T. & Lund, J.F. (2010). Democratic decentralization in sub-Saharan Africa: its contribution to forest management, livelihoods, and enfranchisement. *Environ. Conserv.*, **37**, 35-44.

Robinson, E.J.Z., Albers, H.J., Meshack, C. & Lokina, R.B. (2013). Implementing REDD through community-based forest management: lessons from Tanzania. *Nat. Resour. Forum*, **37**, 141-152.

Robinson, E.J.Z. & Lokina, R.B. (2011). A spatial-temporal analysis of the impact of access restrictions on forest landscapes and household welfare in Tanzania. *For. Policy Econ.*, **13**, 79-85.

Schwartzman, S., Moreira, A. & Nepstad, D. (2000). Rethinking tropical forest conservation: perils in parks. *Conserv. Biol.*, **5**, 1351-1357.

Sills, E., Madeira, E.M., Sunderlin, W.D. & Wertz-Kanounnikoff, S. (2009). The evolving landscape of REDD+ projects. Pages 265-279 in A. Angelsen, M. Brockhaus, M. Kanninen, E. Sills, W.D. Sunderlin, S. Wertz-Kanounnikoff, editors. *Realizing REDD+: national strategy and policy options*. CIFOR, Bogor, Indonesia.

Skutsch, M.M. (2005). Reducing carbon transaction costs in community-based forest management. *Clim. Policy*, **5**, 433-443.

Somanathan, E., Prabhakar, R. & Mehta, B.S. (2009). Decentralization for cost effective conservation. *Proc. Natl. Acad. Sci. USA*, **106**, 4143-4147.

Sunderlin, W.D., Hatcher, J. & Liddle, M. (2008). *From ownership to exclusion: challenges and opportunities in advancing forest tenure reform*. Rights and Resources Initiative, Washington, D.C.

The REDD Desk. (2013). Farm-Africa (Ethiopia). Available from: http://www.theredddesk.org/countries/ethiopia/info/resources/organisations/farm_africa_ethiopia(visited Sept. 8, 2013).

Thompson, O.R.R., Paavola, J., Healey, J.R. *et al*. (2013). Reducing emissions from deforestation and forest degradation (REDD+): transaction costs of six Peruvian Projects. *Ecol. Soc.*, **18**, 17.

TNRF (Tanzania Natural Resources Forum). (2011). REDD realities: learning from REDD pilot projects to make REDD work. Available from: http://www.tnrf.org/files/e-REDD%20Realities.pdf (visited May 25, 2013).

UN-REDD Programme. (2009). UN-REDD programme – Tanzania quick start initiative. Available from: http://www.un-redd.org/UNREDDProgramme/CountryActions/Tanzania/tabid/1028/language/en-US/Default.aspx (visited Jul. 26, 2013).

UN-REDD Programme. (2012). Mexico REDD+legal reforms. Available from: http://www.un-redd.org/Newsletter28/Mexico_REDD_Legal_Reforms/tabid/104165/Default.aspx (visited Jun. 30, 2013).

Vaughan, A. (2012). Amazon deforestation falls again. *The Guardian*, Aug. 3, 2013. Available from: http://www.guardian.co.uk/environment/2012/aug/03/amazon-deforestation-falls-again (visited Jul. 10, 2013).

Vickers, B., Trines, E. & Pohnan, E. (2012). *Community guidelines for accessing forestry voluntary carbon markets*. Food and Agriculture organization of the United Nations, Regional Office for Asia and the Pacific, Bangkok.

Villamor, G.B. & Lasco, R.D. (2009). Rewarding upland people for forest conservation: experience and lessons learned from case studies in the Philippines. *J. Sustain. For.*, **28**, 304-321.

Vyamana, V.G. (2009). Participatory forest management in the Eastern Arc mountains of Tanzania: who benefits? *Int. For. Rev.*, **11**, 239-253.

Wildlife Works. (2013). REDD+resources page. Available from: http://www.wildlifeworks.com/redd/resources.php (visited Sept. 1, 2013).

