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Can REDD+ Reconcile Local Priorities and Needs with Global Mitigation Benefits? Lessons from Angai Forest, Tanzania

[Irmeli Mustalahti](#)¹, [Anna Bolin](#)², [Emily Boyd](#)³, and [Jouni Paavola](#)⁴

ABSTRACT. The scope of the reducing emissions from deforestation and forest degradation (REDD) mechanism has broadened REDD+ to accommodate different country interests such as natural forests, protected areas, as well as forests under community-based management. In Tanzania the REDD+ mechanism is still under development and pilot projects are at an early stage. In this paper, we seek to understand how local priorities and needs could be met in REDD+ implementation and how these expectations match with global mitigation benefits. We examine the local priorities and needs in the use of land and forest resources in the Angai Villages Land Forest Reserve (AVLFR) in the Liwale District of Lindi Region in Tanzania. Primary data was collected in two villages, Mihumo and Lilombe, using semistructured key informant interviews and participatory rural appraisal methods. In addition, the key informant interviews were conducted with other village, district, and national level actors, as well as international donors. Findings show that in the two communities REDD+ is seen as something new and is generating new expectations among communities. However, the Angai villagers highlight three key priorities that have yet to be integrated into the design of REDD+: water scarcity, rural development, and food security. At the local level improved forest governance and sustainable management of forest resources have been identified as one way to achieve livelihood diversification. Although the national goals of REDD+ include poverty reduction, these goals are not necessarily conducive to the goals of these communities. There exist both structural and cultural limits to the ability of the Angai villages to implement these goals and to improve forestry governance. Given the vulnerability to current and future climate variability and change it will be important to consider how the AVLFR will be managed and for whose benefit?

Key Words: *Participatory Forest Management (PFM); pro-poor REDD+; REDD+; Tanzania*

INTRODUCTION

About 15%-17% of global greenhouse gas (GHG) emissions originate from forest related activities (Denman et al. 2007) and occur when forest carbon stocks are depleted and released to the atmosphere through changes in woody biomass, conversion of forests and grasslands, forest fires, and abandonment of managed lands (Engel and Palmer 2008). The United Nations Framework Convention on Climate Change (UNFCCC) conference agreed in Bali in 2007 that a comprehensive approach to climate change mitigation should include reduction of emissions from deforestation and forest degradation (REDD) in developing countries (Parker et al. 2008). REDD is a financial mechanism compensating countries for the prevention of deforestation and forest degradation that would otherwise occur (Chomitz et al. 2006). The 2009 Copenhagen Accord of the UNFCCC recognized REDD as a valid mitigation strategy and has increased interest in and funding of it.

An international accord on REDD+ emphasizes alongside effective greenhouse gas mitigation its environmental cobenefits such as biodiversity protection, sustainable forest management, provision and quality of soil and water, as well as socioeconomic cobenefits, pro-poor development, protection of human rights, and improved forest governance (UNFCCC 2010). However, although REDD+ may offer

increased incomes to forest communities, as well as improved land tenure security and social development (UN-REDD 2009), these cobenefits are not guaranteed (Chhatre and Agrawal 2009). In some cases REDD+ could actually be detrimental to communities through: (i) lacking involvement of indigenous and local communities in process design and management plans (Cotula and Mayers 2009); (ii) weakening land and resource rights from the increase in financial value of forests leading to a “land grab” by public and private investors (World Bank 2010); (iii) undermining local livelihoods through loss of access to forests (Peluso 1992); (iv) discriminating against communities who have already conserved forests or taken early action to do so (Kanninen et al. 2007) and; (v) recentralizing government control over forests (Phelps et al. 2010). Thus, although there are high hopes for REDD+, based on past experiences of evaluation of Clean Development Mechanism (CDM) forests and the difficulty of delivering cobenefits and assessments there is also skepticism regarding to what extent it can actually benefit forest communities (Brown et al. 2004, Bozmoski et al. 2008, Boyd 2009, Boyd et al. 2009, Löwbrand et al. 2009, Corbera and Brown 2010, REDD-net 2010).

The key questions are: Is the global goal of cost effective climate change mitigation compatible with local poverty reduction and development goals? If so, how should local

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priorities and needs be reconciled with global mitigation benefits? How can local priorities and needs be represented in projects that implement a global program?

There are scholars who emphasize that the primary role of mechanisms such as REDD+ is to deliver mitigation or other ecosystem services effectively (Wunder 2008). However, although poverty reduction might not be the primary objective of these schemes, they should be designed so as not to harm the poor (Wunder 2008, Campbell 2009, Seymour 2009, Caplow et al. 2011). Sikor et al. (2010) do call for a greater inclusion and recognition of forest peoples' rights and suggest three principles under which REDD+ should operate in the future: (1) people's participation in decision making affecting them; (2) equitable distribution of forest benefits; and (3) recognition of differences in people's identities, experience, and visions.

Several pro-poor REDD+ designs exist. One of them is based on a national level carbon fund that would be the recipient of financial flows for avoided deforestation, carbon credit sales, and so on. In Tanzania, the fund-based approach has been argued to fit with the realities of communal land and forest tenure under village governance and participatory forest management (Burgess et al. 2010). Two payment strategies are discussed in Tanzania. The first is an effort-based payment, which rewards communities for improved forest management activities. The second is an output-based payment, which rewards forest managers for empirically verified outputs such as improved forest condition and reduced deforestation (TFWG 2010). The effort-based approach would reward villages equally even when their ownership of forest resources and utilization of village land differs. The output-based approach would benefit more communities who have increased their carbon stocks and are able to demonstrate it by carbon baseline, monitoring, and calculation.

To date, research on REDD+ has been dominated by global and national level studies on the governance and cost and benefits of the mechanism (see Hansen et al. 2009, Okereke and Dooley 2009). There has been little research evaluating pre-REDD+ projects, particularly their design and implementation and local experiences with them (Caplow et al. 2011, Corbera and Schroeder 2011). Also, based on our literature review, to date little attention has been paid to the miombo woodlands in Africa.

In this paper, we examine what the local priorities are in the use of land and forest resources, which need to be met in the design and implementation of REDD+. We focus on participatory forest management (PFM) in REDD+ and the interaction between local, national, and international stakeholders. In Tanzania, REDD+ is seen as a potential source of additional forest revenue that fits within the legal framework of the PFM and that would allow villagers to cobenefit from natural resources (URT 2010). However, there are growing

concerns about how communities can protect their land rights and ensure their right to decision making over the use of land and resources (Campese 2011). We highlight how difficult it can be to reconcile local, national, and global priorities in REDD+ by using evidence from participation in PFM and preparation for REDD+ involvement in the Angai Villages Land Forest Reserve (AVLFR). We situate the role of forests and their management in mitigating climate change and enhancing peoples' livelihoods. We describe the research design and methods used in conducting the case study and present and discuss our findings based on local perspectives generated from semistructured interviews.

LITERATURE REVIEW

The miombo woodlands cover 2.4 million km² of southern Africa and host a population of 100 million people, three quarters of whom are rural poor (Bond et al. 2010). Miombo woodland is the main forest type in Tanzania, encompassing 40% of the land cover. Of the total forest area of 35.3 million ha in Tanzania, forest reserves make up 16 million ha, national parks spread over 2.2 million ha, and the remaining 17.3 million ha consist of unprotected forest or open access public land that is not reserved (URT 2009). The miombo woodlands play an important role for both rural and urban populations in Tanzania: they support 87% of rural livelihoods, 90% of the national energy supply, and 75% of construction materials (Miles et al. 2009).

Drivers of deforestation in sub-Saharan Africa are embedded in socioeconomic relations between the state, private sector, and local people, as well as in chronic poverty. Between 1990–2000 Tanzania's deforestation rate was over 400,000 ha or about 1.1% per annum (Chiesa et al. 2009). The main drivers of deforestation and forest degradation in Tanzania's miombo woodlands are agricultural intensification, shifting subsistence cultivation, production of charcoal and fuel wood, and illegal logging of high-value timber (Sunseri 2009). Deforestation takes place mostly on open-access public land while degradation occurs in village lands and in state forests. In 2004, timber exports were banned as a result of a scandal involving illegal logging and corruption (Chiesa et al. 2009). The following year a report by TRAFFIC (Milledge and Elibariki 2005) documented the poor state of governance in the forestry sector (see also Mustalahti and Lund 2009).

Deweese et al. (2010) argue that successful management of African miombo woodlands is important for three reasons: (i) they sequester enormous amounts of carbon; (ii) they support livelihoods of millions of people and provide a renewable source of energy, i.e., fuel wood and charcoal; and (iii) their successful management would contribute to poverty alleviation by supporting and strengthening local livelihood strategies. In times of stress the forests serve as an insurance against famine by offering a source of wild foods and fruits and other useful products (Paavola 2008, Deweese et al. 2010).

Against this background, REDD+ could combine carbon sequestration with poverty reduction if it was designed so as not to unduly restrict current forest uses for livelihood purposes.

A brief reflection on the Clean Development Mechanism (CDM), which resembles REDD+ in terms of its governance structure, scale of operation, and their shared goal of contributing to local sustainable development, suggests that marrying poverty and carbon sequestration is a challenge. In particular, the contribution of CDM projects to local sustainable development has varied and is sometimes negligible. One reason for this is the varying degree to which CDM project developers have included local stakeholders in project design (Boyd et al. 2009). Regardless of type of project, its outcomes depend on the degree of community inclusion in the decision making process, and the ability of projects to address local capacity building needs (Bozmoski et al. 2008, Nussbaumer 2009, Watson and Frankhauser 2009). Boyd (2009) argues that there is need for vertical communication, interaction, and nested governance agreements, as well as horizontal arrangements in CDM. Vertical and horizontal communication, interaction, and governance agreements are also needed in REDD+ to involve and ensure participation of key stakeholders.

Nevertheless, REDD+ also differs from CDM because it involves governance and sector reforms at the national level while integrating local mitigation and capacity building with national and global governance reforms and benefit sharing. This considerable task requires substantial amounts of resources and capacity. The REDD+ financing scheme calls for transparent national forest monitoring methodologies and carbon accounting systems. In 2010 the UNFCCC delegates to the Conference of the Parties 16 in Cancun agreed that the REDD+ mechanism and Measurement, Reporting, and Verification (MRV) activities are to be financed and implemented after 2012 (UNFCCC 2010). In Tanzania, the government of Norway is already supporting demonstration activities and pilot projects and the same is happening in other REDD+ pilot countries with the support of international NGOs and donors.

Many REDD+ pilot projects entail full forest protection because they are undertaken in a protected area. Examples include the Noel Kempff Climate Action Project in Bolivia, the Ulu Masen Ecosystem REDD project in Aceh Indonesia, the Juma Sustainable Development Reserve project in Brazil, and the Rio Bravo Climate Action Project in Belize (Brown et al. 2000, Murdiyarso and Skutsch 2006, Boyd et al. 2007, Rafli et al. 2007, Viana et al. 2008, Johns and Johnson 2009). Other pilot projects such as the Belgica REDD project and the Maderacre and Maderiyja Madre de Dios Amazon REDD project in Peru involve changes to forest management practices (Brotto 2009, Murray 2009). Caplow et al. (2011) suggest that REDD+ projects should integrate rigorous

evaluation standards, carbon baseline, and mixed methods to understand the process of implementation and required level of interplay between the scientific and practitioner communities. The experiences emerging from pilot projects could provide more widely applicable solutions (Danielsen et al. 2011).

Tanzania is one of the nine UN-REDD pilot countries. In Tanzania, REDD+ builds on the existing framework of forest governance but involves comprehensive policy reform and capacity building at national and subnational levels. In Tanzania, PFM is a catchall term for decentralized forest management strategies irrespective of tenure. Local people participate in developing objectives, plans, and rules for the use and management of their village or community forests, household forest areas, or joint forest management (JFM) areas in which locals manage forests on behalf of or with the local or central government authorities or a concession holder (Mustalahti 2007). Past experiences have shown that administrative and financial discretionary powers constrain the implementation of PFM despite its legal status and official endorsement (Mustalahti and Lund 2009, Vihemäki 2009). This is particularly true if civil servants and other public and forestry sector actors stand to lose control of financially valuable resources (see Kobb 1998, Lund 2007; see also Fjeldstad 2001, Kelsall 2004). REDD+ is likely to raise economic stakes among public officials at various levels of forest governance.

Small financial benefits of PFM have limited the interest of communities and public officials to invest their time and efforts to sustainable forest management (Mustalahti 2009). Immediate financial needs are prioritized over long-term benefits even at the cost of increased future vulnerability. In Tanzania, 80% of the labor force is employed in the agricultural sector. Production is primarily rain fed, with only 2% of arable land being irrigated (Ahmed et al. 2009). Thus the ability and access of rural communities to adopt new income generating activities is very important for adapting to a variable climate. REDD+ projects could integrate forest carbon protection and monitoring with other market incentives, such as game and biodiversity management, sustainable forest certifications, and low impact logging to support local communities. Paavola (2008) also found that rural Tanzanians have limited options to diversify their livelihoods and suggests that climate policies need to expand livelihood diversification options and address obstacles that limit agricultural households' ability to do so. Studies have shown that this approach can also be beneficial to meeting the goal of emission reduction (Brotto 2009, Rainforest Alliance 2010).

RESEARCH DESIGN: CASE STUDY AND METHODS

Angai Villages Land Forest Reserve (AVLFR) is located in the Liwale District of Lindi Region in Tanzania. The region is one of the poorest and most sparsely populated in the

country. People depend on the forest and associated ecosystem services for energy, arable land, construction materials, edible plants, and other forest products. Agricultural use of forest land is considered vital although forest degradation and forest fires caused by agriculture land clearance are a threat to sustainable use of natural resources.

AVLFR encompasses nearly half a million hectares of land, of which about 30% is forest and the rest is village general land. The reserve is managed by 13 villages, which were established during the villagization (“Ujamaa”) in the 1970s in an effort to bring social services to the reach of rural people. The villages have grown over the years and the District Council wants to divide the original 13 villages into 24 villages. The original 13 villages secured formal ownership of 139,420 ha of the Angai forest and got the villages’ land certifications for 464,474 ha of land in 2005. However, the formal boundary process and land use planning need to be carried out again in the new 24 villages before they have legal rights to benefits from forest resources.

AVLFR has a history of contested ownership (Sunseri 2005). In 1993, Liwale District requested support from the Finnish Rural Integrated Project Support (RIPS) program for the demarcation of the Angai Forest as a district forest reserve. The villages opposed this because customary land rights belonged to the villagers. RIPS proposed the establishment of an intervillage union to coordinate village efforts in negotiations with the district and in the management of the reserve (Mustalahti 2007). The union of the 13 Angai villages, MUHIMA (“Muungano wa Hifadhi ya Msitu wa Angai”), was established in 2001.

AVLFR is one of the largest PFM sites in Tanzania and one of three sites in the Tanzanian Group on Earth Observation–Forest Carbon Tracking National Demonstration Project. A feasibility study of REDD+ projects prepared by the Clinton Climate Initiative (CCI) and participatory forest carbon assessment (PFCA) demonstrated that AVLFR has high carbon stocks and thus has potential for a community REDD+ project (CCI 2009, Mukama 2010). Results from PFCA in three Angai village forest areas suggest carbon stocks of 332.81 - 266.4 MgC, 163.42 - 139.01 MgC, and 120.23 - 102.56 MgC in Mihumo, Ngongowe, and Ngunja, respectively (Mukama 2010). Although the studied forest areas have relatively low carbon stock per hectare, under effective management the amount of carbon sequestration would be sufficient for carbon trading because of the large total area of the forest.

We chose two of the Angai villages, Mihumo and Lilombe, as case studies for this paper. Mihumo was chosen because it had already been introduced to the idea of REDD+ during PFCA in 2009. Lilombe was selected because of its relative isolation. The village became connected to Liwale town, 64 km away, only in 2007 when a new road was built. Because

of its isolation, Lilombe has always had limited access to information and research and development interventions.

Primary data was collected using semistructured key informant interviews and participatory rural appraisal methods such as focus group discussions in the context of participatory action research. Case study material was collected using participant observation and semistructured interviews. Participatory Rural Appraisal (PRA) methods such as transect walks, pair-wise ranking, pathways, and scenarios exercises also formed part of the primary data collection. Participant observation was carried out at two intervillage meetings where representatives from the 13 villages were present, and at three general assembly meetings in the case study villages and in one additional village. Transect walks were used to assess land use activities, availability or scarcity of water resources, and the level of forest degradation and illegal logging in the reserve. Pair-wise ranking, visioning, and pathway scenario exercises, in which both village leaders and common villagers participated, were used to initiate discussions about priorities and goals for the future of the reserve and the area.

In total, 25 key informant interviews were conducted with actors at the village, district, and national level, as well as international actors (donors). At the village and district levels, interviewees were mainly village leaders (n = 13) and district staff (n = 4) involved in natural resource management and REDD+ planning. Informal discussions were held in a mixed group of randomly selected individuals representing different forest user groups. At the national level, interviews were held with representatives from the academia (n = 2), NGOs (n = 3), and relevant ministries (n = 3). Interviewees were selected on the basis of their expertise and involvement in national REDD+ planning. Interviewees also included international actors such as the CCI of the Clinton Foundation. Interview results were triangulated with participant observation at the intervillage meetings and with observations from the transect walks. Results from PRA exercises were drawn up and discussed with the participants.

ANALYSIS

Our analysis seeks to understand how local priorities, needs, and constraints could be met in the implementation of REDD+. In what follows, we will first briefly outline the institutional context for REDD+ implementation in the Angai village. Second, we examine the local priorities in building integrated institutional design for REDD+ in Angai villages. Third, we will explore to what extent interplay between local, national, and international stakeholders has influenced forest governance in the case of AVLFR.

(I) The institutional context for REDD+ implementation in Angai

Tanzania’s forest legislation provides for two instances of community-based forest management: (i) Village Land Forest

Reserves (VLFR), and (ii) joint forest management (JFM) agreements between local communities and the local or national authority having jurisdiction over the reserve in question. In VLFRs, the village council has executive rights to manage in accordance with a management plan, i.e., to plan and perform activities such as resource extraction, patrols, fire control, and tree planting, to arrest offenders and set rates and collect fees for forest uses and fines for offences (URT 2002).

Although law on the rights of village councils is clear, it is ambiguous on: (i) the process of attaining the rights, and (ii) the process of losing the rights (Mustalahti and Lund 2009). For example, in VLFRs local communities have a right to all extraction benefits but not without conditions. To benefit from VLFR four steps needs to be taken. First, forests must be mapped and demarcated. Second, a Forest Management Plan (FMP) needs to be prepared in line with the national guidelines. The FMP includes village bylaws containing rules and sanctions in cases of misuse or mismanagement. Third, a Village Natural Resource Committee (VNRC) has to be elected to manage the forest. If a village fails to implement the management plan, the district commissioner and the director of forestry have the right to withdraw its right to manage the forest (URT 2002 sec. 8).

These formal rights and conditions will also be preconditions of community access to REDD+ benefits in the future. In the light of our case study, gaining these rights and fulfilling the preconditions can be complicated. The demarcation of village forest for PFM started in the Angai villages in the late 1990s. The villages are still awaiting the completion of their forest management plans and bylaws after 15 years of negotiation and planning. Expectations of financial benefits have grown into frustration because so far none of the expected benefits of PFM has been delivered:

We have been telling people for years that if we keep preserving the forest it will bring us benefits. PFM has been going on since the 1990s and we are yet to see these benefits. If the benefits from carbon are not soon there then we will have a problem. People are losing faith and villagers will not believe us anymore (Member of the VNRC in Mihumo).

REDD+ is seen as something new and is generating new expectations. There is a strong feeling of ownership of the VLFR in the villages. Although formal ownership was gained only in 2005, the Angai forest has historically been perceived as village land (Sunseri 2005, 2009). Traditional ceremonies and rituals are performed there and it is seen as a heritage that has to be preserved for future generations. The villages have a goal of keeping and managing the forest so that they can invest for the future. The question is whether the villages are able to manage the forest by themselves or whether they should use an external service provider, e.g., forest

certification and REDD+ schemes to gain access to financial benefits. Forest management under the FSC and REDD+ requires skills and expertise, particularly in measurement and reporting. However, these were not seen as obstacles:

We should have full management responsibility, because we are the ones who live next to the forest and therefore we have the greatest stake. Outsiders would not know how to manage it as well because they would do it according to what is important to them (Former head of the VNRC in Mihumo village).

The above statement highlights why REDD+ involves important questions of equity regarding the right of communities to participate in decisions that impact on their lives. Currently, communities find themselves in the role of forest owners and managers with no other option but to protect their resource because otherwise they risk losing it. Under these conditions REDD+ could offer much needed support and finances to achieve PFM policy goals. However, it also poses a risk for the same reasons that PFM could not deliver expected benefits. PFM activities have been externally driven in design and finance, and implementation processes are slow. REDD+ standards, registration, and monitoring requirements are likely to be even more demanding than those of the PFM. The key question is how the local priorities are integrated into the design of REDD+ projects so that local communities will maintain an interest in them.

(II) Building a locally integrated institutional design for REDD+ in Angai

Local priority 1: water availability

The Angai villages sought to participate in PFM and REDD+ to access cobenefits while protecting the forest for the provision of ecosystem services. Key informant interviews with the elders in the two villages suggest that rainfall has become more irregular over time and that there is a shortage of water. In Lilombe, women were concerned because in recent years water scarcity has started already in March, which is supposed to be the middle of the rainy season. The Majuni pond at the Mihumo side of the Angai forest exemplifies the vanishing water resources. One of the elders recalled that “in 1962 the pond was full of water and there used to be plenty of animals such as hippos, elephants, and antelopes. But water levels have decreased slowly and since 2007 the pond has been dry.”

In the two case study villages, where almost everyone is a subsistence farmer, the issue of water scarcity is a major concern and protecting water resources is a high priority. In both villages and in intervillage meetings water came up as the most important benefit derived from the forest reserve. Water scarcity is also related to food insecurity, which is experienced in most years between the planting and harvesting

season in February-March. Villagers do follow government advice to plant drought resistant crops such as cassava, maize, and millet but farming techniques remain traditional and there are limited opportunities to more intensive agriculture. The government subsidizes fertilizers but water remains a concern.

An irrigated rice cultivation scheme is being developed in one of the Angai villages, Ngongowe. It may provide benefits to those involved in the scheme but it also has its problems in an area of water stress. The scheme will use about 40% of water flow leaving just 60% for downstream villages. During an interview with the project developers it became clear that although an environmental impact assessment had been completed, the findings had not been communicated to neighboring villages. Agriculture and the management of village lands such as forests are considered separate issues, which may lead to decisions that aggravate water scarcity and vulnerability to water stress.

Also in PRA exercises water was valued higher than any other benefits derived from the forest. According to one focus group, water and prosperity go hand in hand: "Since all things come from water. With good rainfall we will have more crops that we can sell which means more prosperity" (Participant during the Pair-wise ranking exercise in Lilombe village).

Preserving water resources is the main reason for the local communities for preserving the AVLFR. People also felt that it was important to preserve forest resources for wild foods and medicine, although these benefits were not valued as highly during ranking exercises. More important was the prospect of financial benefits.

Local priority 2: rural development benefits

Aspirations of better infrastructure, housing, social services, and income-generating activities form the second priority. Perceived ways to achieve them include sustainable management of the AVLFR to attract paying visitors, and the protection of ecosystem services beneficial to agriculture, which could be taxed to generate funds for development activities.

As suggested, the Angai villages are still waiting for financial benefits from the AVLFR. Small-scale logging is taking place but because the villages do not yet have forest management plans, the benefits from logging go to the district council. Illegal logging also occurs and it benefits a few individuals instead of the villages more broadly. Logging in the AVLFR is carried out in the traditional way as pit sawing, which results in forest degradation rather than large-scale clearing. Logging is practiced without harvesting plans and mainly large, high quality, and high value trees are harvested. On the basis of transect walks and PFCA data (Mukama 2010), current logging practices harm the regeneration of high value timber and lead to forest degradation. Completion of the FMPs and

bylaws would bring the Angai villages one step closer to sustainable forest management and it would also open up other possibilities such as participation in REDD+ or forest certification under timber or carbon certification standards.

There is a need for improved forest governance and sustainable management of forest resources as one way to achieve livelihood diversification. Access to timber and carbon markets would help to diversify livelihoods as well as motivate people to manage and protect forest resources. However, relying on REDD+ or voluntary carbon markets as the only sources of forest income could be risky: it could create a dependence on carbon markets and lead to the omission of other land and forest related benefits and streams of income.

Local priority 3: food security

Interviews in Mihumo and Lilombe suggest that people can cope with food insecurity and water stress in several ways but remain constrained by the availability of resources. People rely on their families and extended networks during periods of stress. In Angai, out-migration is not common but in-migration from other areas is common. In Lilombe, in-migration was considered to have negative impacts. The majority of migrants come to mine, not to grow food. Where they have settled for cultivation of food it has been considered an encroachment and a risk rather than a benefit. Also, newcomers do not bring benefits in terms of extended social networks. In Mihumo, in-migration was considered positive. People move from the neighboring Liwale town to cultivate and they ask for temporary land holdings. Even though this means less land available for permanent residents, the village chairman argued that this meant new positive relationships and connections: "So for example in the case of famine you have an extended clan to ask for help in terms of food assistance" (Chairman of Mihumo village).

Converting forest for growing agricultural crops or for the establishment of tree crop plantations could well benefit the poor and improve livelihoods, depending on market access and commodity prices. However, the main benefit from REDD+ to local communities could be the maintenance of ecosystem services and natural resources on which they depend, particularly during periods of stress (see Paavola 2008). Access to firewood, wild vegetables, fruits and mushrooms, medicines, and water, as well as rainfall catchment area can provide a buffer against adverse climate change impacts and foster local adaptation to them.

In both Lilombe and Mihumo, villagers reported in interviews that they work on farms of others in exchange for food. Village councils recommend that households store cash crops as a strategy to mitigate future food shortages, but there are no other plans or strategies to assist with coping. Resource constraints clearly limit the range of options for coping and adapting. Therefore, vulnerability to current and future climate

variability and change in the villages depends on the way in which the AVLFR will be managed and for what benefits.

(III) Barriers to inclusive design for REDD+ governance beyond Angai

In Tanzania, the establishment of national REDD baselines and standards has attracted considerable attention. It has been supported by the UN-REDD program, the Royal Norwegian Embassy, the Clinton Climate Initiative, as well as other donors and NGOs. However, less attention has been given to the alignment of global, national, and local priorities in forest management. Tanzania's national REDD+ strategy acknowledges the need to create a comprehensive REDD+ framework that is cross-sectoral and a part of a wider climate change mitigation and adaptation strategy (URT 2010). Its development has involved consultations with experts and various stakeholders to assess needs for support and improvement and assessment of unforeseen risks related to REDD+. The pilot projects combining REDD+ with PFM are underway and are seeking to build technical capacity in the establishment of a baseline and the measurement of carbon stocks as well as guidelines for benefit sharing practices and safeguards for pro-poor REDD+.

Although the national goals of REDD+ include poverty reduction, globally the scheme is about the creation of carbon markets to achieve low-cost greenhouse gas mitigation. The goals of poverty reduction are not necessarily conducive to the goals of climate change mitigation and vice versa. Approaches that reduce exposure to and risks of carbon markets, such as the combination of timber certification and REDD+, could offer better prospects for improving livelihoods than REDD+ alone. We discuss local goals with regard to the AVLFR and how interactions between local, national, and global stakeholders have affected these goals, to shed light on how REDD+ could be implemented to improve forest governance and to benefit local communities in Tanzania.

Three main goals were identified during the focus group discussions and in PRA exercises in Mihumo and Lilombe: (1) the AVLFR should be managed and controlled by the villages and not by an external service provider; (2) the forest should be preserved for the long-term benefits of future generations; and (3) funds generated from the AVLFR should be used to improve social services and infrastructure in the villages.

There are structural and cultural constraints that limit the Angai villages' ability to implement these goals and to improve forestry governance. Poverty and dependency on outside actors are key structural constraints, and cultural constraints include the culture of allowances and benefit sharing that impedes knowledge dissemination and retention. For example, the MUHIMA, the union of the 13 villages, was established to unify the villages and to coordinate their

negotiations with district officials. MUHIMA was expected to defend Angai villages' interests and legal rights. However, it has had only four recorded meetings since 2001 and has had little impact on the negotiations to date. According to MUHIMA's Memorandum of Understanding (MUHIMA 2010), the board will comprise of five representatives from each of the thirteen villages. Section 6.3 of the MUHIMA (2010) stipulates: "MUHIMA Board will discuss and formulate a transparent and equitable system of distributing costs and benefits accrued from Angai Forest based on the approved management plans and annual work plans."

The role of MUHIMA as "a discussion roundtable" for benefit sharing could give it more power. However, considering its track record to date, it is questionable to what extent it could act as a representative and defender of community rights and interests. There are also other factors that hamper information sharing and representation. Current structures of information and knowledge sharing only benefit the few who are participating in the meetings organized by the District Council or donor agencies. When information remains among the privileged few, there is a risk of elite capture. For example, a member of the previous year's VNRC admitted that only a few people currently benefit from timber harvesting. If these people represent the village on the MUHIMA board there is a conflict of interest in advancing sustainable forest management versus maintaining the current impasse.

In the Angai villages, access to benefits under the PFM is restricted by a number of internal and external factors, despite well-designed legal frameworks and community participation in Tanzania. External factors include chronic dependency on outside actors for resources and technical support. The lack of consistency in donor support and the weak agency of local actors have cocreated the situation. Angai villages have received on and off donor support for over 15 years. The PFM process and the intervillage union MUHIMA have not progressed much over this time. Villages have depended on external actors for resources and access to information such as legal processes and documentation. The villagers and the district also had different views on who was responsible for convening MUHIMA meetings.

However, the external factors alone do not explain weak awareness of benefits, decisions, and agreements related to forest management among the villagers or which representatives are participating in training and meetings. There is surprisingly little awareness about past and current events related to PFM and REDD+. In the Mihumo focus group discussion, those who had benefited from some training over the years admitted that they had not distributed any of the information they had gained to the wider community. When asked why, it became clear that sharing information was associated with costs: "Three quarters of people want to hear what you have learnt and the rest get annoyed with you for not

sharing any of the money you have been paid during the training” (Previous member of the VNRC in Mihumo).

Attendance at meetings is usually rewarded with allowances to cover the transport and opportunity costs of participants. People understand them as benefits that have to be shared. This has created a culture of allowances; interaction with external actors such as government representatives or donors is associated with money. However, allowances only barely cover expenses. Another respondent reported that he did not share any of the information and training he had received because he could not afford to do so. The village chairman of Mihumo expressed similar concerns; he found it difficult to afford paying others to pass on the information he had gained in meetings in town.

Dependency and expectation of support or benefit sharing by others is not restricted to the village level: aid dependency is present at all levels of government. The experiences of Angai villages from the PFM process suggest that these structural and cultural constraints will impede the implementation of projects; interaction with stakeholders is sought for private benefit and not for the common good. There are thus lessons to be learned for the future planning and consultation of stakeholders for REDD+ to ensure more equitable and effective knowledge sharing and distribution of benefits.

Several positive developments are underway in Tanzania that could offer opportunities to forest communities such as the Angai villages. One is the rising influence of MJUMITA, the Tanzania community forest network. MJUMITA branched out of the Tanzania Forest Conservation Group (TFCG) for an advocacy role in protecting communities’ rights in the PFM negotiations. It was founded by TFCG in 2000 and became an independent organization in 2007. MJUMITA consists of a network of forest owners and managers, currently covering 11 regions, 22 districts, and 318 villages. MJUMITA seeks to empower local communities involved in PFM and in REDD+. It is also playing an important role in capacity building. It has its own capacity building program, which involves the setting up of training academies for actors involved in project implementation, as well as a carbon cooperative. The training academy is to provide training on climate change, REDD+, and PFM for the project staff, district forest officers, and members of the community. The aim of these academies is to create a dialogue between the various actors about the drivers of deforestation and to identify appropriate actions for mitigation.

The purpose of the carbon cooperative is to help communities reduce transaction costs, engage with buyers in the voluntary carbon markets, and manage and distribute funds to participating communities. To join the network, a villager can pay the membership fee, a group of villagers can form a community based organization, or the village can become a member of MJUMITA. Some of the Angai villages already

have a contact to MJUMITA and currently four people from the Angai villages have paid MJUMITA membership and are aiming to establish a network with fellow villagers. However, it still remains to be seen where this leads. MJUMITA has set a plan to invite the Angai villagers to their training academies to overcome some of the obstacles of knowledge dissemination and retention in the villages.

CONCLUSIONS

The links between forest governance, development efforts, and pro-poor REDD+ are complicated. Although climate change poses a risk to the most vulnerable poor in rural Tanzania, the challenge of developing forest management strategies that meet the needs of the poor as well as those of future generations is considerable. In Tanzania, PFM has attracted attention to forest reserves and leakage to village lands. Little is known about how to address the leakage and how permanent REDD+ projects will be. To address the leakage and ensure the permanence of the REDD+ mechanism, more research is needed on land use planning, conservation, and agroforestry practices, as well as potential costs and implications for REDD+ in semiarid regions such as the miombo woodlands of Tanzania.

The implementation of PFM in Tanzania has a mixed record and REDD+ will also bring about both risks and opportunities to rural livelihoods, depending on how it is designed and implemented. We indicated that a key contribution of REDD+ to local communities could be cobenefits in the form of ecosystem services. Firewood and charcoal, wild vegetables, fruits, medicines, and water, as well as rainfall catchment provided by the forest function as buffers against adverse climate change impacts and foster local adaptation to them. However, environmental cobenefits alone do not sufficiently reduce vulnerability to climate change. REDD+ could generate income and improve and diversify local livelihoods. The new forest governance regime underpinning REDD+ would thus have to identify options for improving local livelihoods. Without this, there is a real risk of raising expectations in local communities but without much being delivered.

The challenges of harnessing carbon markets for pro-poor development under REDD+ are significant. A governance approach with room to maneuver such as fund-based and effort-based payments holds some promise: they would reward communities for improved forest management. Funds could be available under an internationally and nationally funded and monitored carbon fund. This fund could mitigate the changes of carbon price that are a risk to communities and could ensure that the agreed funding for community activities would be available in the long run. If REDD+ is designed in a way that addresses local priorities and needs and if it builds agriculture and livelihood diversification capacity at the local level, then there is an opportunity for a more fair and equal

approach to forestry governance and climate change mitigation. However, the question remains to what extent such a solution would remain aligned with the aim of global carbon markets to deliver low-cost mitigation.

Responses to this article can be read online at:
<http://www.ecologyandsociety.org/vol17/iss1/art16/responses/>

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LITERATURE CITED

- Ahmed, S. A., N. S. Diffenbaugh, T. W. Hertel, D. B. Lobell, N. Ramankutty, A. R. Rios, and P. Rowhani. 2009. *Climate volatility and poverty vulnerability in Tanzania*. World Bank Policy Research Working paper 5117. World Bank, Washington, D.C., USA. [online] URL: http://econ.worldbank.org/external/default/main?pagePK=64165259&theSitePK=469372&piPK=64165421&menuPK=64166093&entityID=000158349_20091109085100
- Bond, I., M. Chambwera, B. Jones, I. Nhantumbo, and M. Chundama. 2010. *REDD+ in dryland forests: issues and prospects for pro-poor REDD in the miombo woodlands of southern Africa*. Natural Resource Issues No. 21. International Institute for Environment and Development, London, UK. [online] URL: <http://pubs.iied.org/17506IIED.html?k=bond>
- Boyd, E. 2009. Governing the clean development mechanism: global rhetoric versus local realities in carbon sequestration projects. *Environment and Planning A* 41:2380-2395. <http://dx.doi.org/10.1068/a41341>
- Boyd, E., N. Hultman, J. Timmons Roberts, E. Corbera, J. Cole, A. Bozmoski, J. Ebeling, R. Tippman, P. Mann, K. Brown, and D. M. Liverman. 2009. Reforming the CDM for sustainable development: lessons learned and policy futures. *Environmental Science & Policy* 12(7):820-831. <http://dx.doi.org/10.1016/j.envsci.2009.06.007>
- Boyd, E., P. May, M. Chang, and F. C. Veiga. 2007. Exploring socioeconomic impacts of forest based mitigation projects: lessons from Brazil and Bolivia. *Environmental Science & Policy* 10(5):419-433. <http://dx.doi.org/10.1016/j.envsci.2007.03.004>
- Bozmoski, A., M. C. Lemos, and E. Boyd. 2008. Prosperous negligence: governing the clean development mechanism for markets and development. *Environment* 50:3. <http://dx.doi.org/10.3200/ENVT.50.3.18-30>
- Brotto, L. 2009. *Bridging SFM certification with voluntary carbon market standards in REDD projects: organizational aspects analysis*. Department book No.106, Department of Land and Agro Forestry System, University of Padua, Padua, Italy.
- Brown, K., N. Adger, E. Boyd, E. Corbera, and S. Shackley. 2004. *How do CDM projects contribute to sustainable development?* Technical Report no. 16, Tyndall Centre for Climate Change Research, University of East Anglia, Norwich, UK.
- Brown, S., M. Burnham, M. Delaney, M. Powell, R. Vaca, and A. Moreno. 2000. Issues and challenges for forest based carbon offset projects: a case study of the Noel Kempff climate action project in Bolivia. *Mitigation and Adaptation Strategies for Global Change* 5(1):99-121. <http://dx.doi.org/10.1023/A:10096209032310.1023/A:1009620903231>
- Burgess, N. D., B. Bahane, T. Clairs, F. Danielsen, S. Dalsgaard, M. Funder, N. Hagelberg, P. Harrison, C. Haule, K. Kabalimu, F. Kilahama, E. Kilawe, S. L. Lewis, J. C. Lovett, G. Lyatuu, A. R. Marshall, C. Meschack, L. Miles, S. A. H. Milledge, P. K. T. Munishi, E. Nashanda, D. Shirima, R. D. Swetnam, S. Willcock, A. Williams, and E. Zahabu. 2010. Getting ready for REDD+ in Tanzania: a case study of progress and challenges. *Oryx* 44(3):339-351. <http://dx.doi.org/10.1017/S0030605310000554>
- Campbell, B. M. 2009. Beyond Copenhagen: REDD+, agriculture, adaptation strategies and poverty. *Global Environmental Change* 19:397-399. <http://dx.doi.org/10.1016/j.gloenvcha.2009.07.010>
- Campese, J. 2011. *Integrating REDD+ social and environmental safeguards and standards in Tanzania*. Tanzania Forest Conservation Group Technical Report 32. TFCG, Dar es Salaam, Tanzania.
- Caplow, S., P. Jagger, K. Lawlor, and E. Sills. 2011. Evaluating land use and livelihood impacts of early forest carbon projects: lessons for learning about REDD+. *Environmental Science & Policy* 14:152-167. <http://dx.doi.org/10.1016/j.envsci.2010.10.003>
- Chhatre, A., and A. Agrawal. 2009. Trade-offs and synergies between carbon storage and livelihood benefits from forest commons. *Proceedings of the National Academy of Sciences* 106:17667-17670. <http://dx.doi.org/10.1073/pnas.0905308106>
- Chiesa, F., M. Dere, E. Sartarelli, and H. Sandbank. 2009. *UN-REDD in Tanzania: project on Reducing Emissions from Deforestation and forest Degradation in developing countries*. John Hopkins School of Advanced International studies,

- Washington, D.C., USA, and United Nations Environment Programme World Conservation Monitoring Centre, Cambridge, UK. [online] URL: <http://www.cabdirect.org/abstracts/20103015278.html;jsessionid=DD037832DAC422F04ED279F51D454998>
- Chomitz, K. M., P. Buys, G. De Luca, T. S. Thomas, and S. Wertz-Kanounnikoff. 2006. *At loggerheads? Agricultural expansion, poverty reduction and environment in the tropical forests*. World Bank Policy Research, Development Research Group, World Bank, Washington, D.C., USA.
- Clinton Climate Initiative (CCI). 2009. *Feasibility study to assess the potential of the Angai Village Land Forest Reserve to become a community REDD project*. Report commissioned by the Clinton Foundation to Camco Advisory Services. Clinton Foundation Climate Change Initiative, Dar es Salaam, Tanzania.
- Corbera, E., and K. Brown. 2010. Offsetting benefits? Analyzing access to forest carbon. *Environment and Planning A* 42:1739-1761. <http://dx.doi.org/10.1068/a42437>
- Corbera, E., and H. Schroeder. 2011. Governing and implementing REDD+. *Environmental Science & Policy* 14:89-99. <http://dx.doi.org/10.1016/j.envsci.2010.11.002>
- Cotula, L., and J. Mayers. 2009. *Tenure in REDD - Start-point or afterthought?* Natural Resource Issues No. 15. International Institute for Environment and Development, London, UK.
- Danielsen, F., M. Skutsch, N. D. Burgess, P. M. Jensen, H. Andrianandrasana, B. Karky, R. Lewis, J. C. Lovett, J. Massao, Y. Ngaga, P. Phartiyal, M. K. Poulsen, S. P. Singh, S. Solis, M. Sørensen, A. Tewari, R. Young, and E. Zahabu. 2011. At the heart of REDD+: a role for local people in monitoring forests? *Conservation Letters* 4:158-167. <http://dx.doi.org/10.1111/j.1755-263X.2010.00159.x>
- Denman, K. L., G. Brasseur, A. Chidthaisong, P. Ciais, P. M. Cox, R. E. Dickinson, D. Hauglustaine, C. Heinze, E. Holland, D. Jacob, U. Lohmann, S. Ramachandran, P. L. da Silva Dias, S. C. Wofsy, and X. Zhang. 2007. Couplings between changes in the climate system and biogeochemistry. Pages 499-588 in S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, editors. *Climate change 2007: the physical science basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK.
- Deweese, P. A., B. M. Campbell, Y. Katerere, A. Siteo, A. B. Cunningham, A. Angelsen, and S. Wunder. 2010. Managing the miombo woodlands of southern Africa: policies, incentives and options for the rural poor. *Journal of Natural Resources Policy Research* 2(1):57-73. <http://dx.doi.org/10.1080/19390450903350846>
- Engel, S., and C. Palmer. 2008. *Painting the forest REDD? Prospects for mitigating climate change through Reducing Emissions from Deforestation and Degradation*. IED Working Paper 03, Institute for Environmental Decisions, Swiss Federal Institute of Technology, Zurich, Switzerland.
- Fjeldstad, O.-H. 2001. Taxation, coercion and donors: local government tax enforcement in Tanzania. *Journal of Modern African Studies* 39:289-306. <http://dx.doi.org/10.1017/S0022278X01003627>
- Hansen, C. P., T. Treue, and J. F. Lund. 2009. Challenges and opportunities in implementing REDD at the national level: the case of Ghana. *Earth and Environmental Science* 6(25). <http://dx.doi.org/10.1088/1755-1307/6/25/252006>
- Johns, T., and E. Johnson. 2009. *An overview of readiness for REDD: a compilation of readiness activities prepared on behalf of the Forum on Readiness for REDD*. Version 1.2. Falmouth, Woods Hole Research Center, Massachusetts, USA.
- Kanninen, M., D. Murdiyarso, F. Seymour, A. Angelsen, S. Wunder, and L. German. 2007. *Do trees grow on money? The implications of deforestation research for policies to promote REDD*. Center for International Forestry Research (CIFOR), Bogor, Indonesia.
- Kelsall, T. 2004. *Contentious politics, local governance and the self. A Tanzanian case study*. Research report no. 129. Nordiska Afrikainstitutet, Uppsala, Sweden.
- Kobb, D. 1998. *Forestry royalties in Tanga region: paper versus reality*. East Usambara Catchment Forest Project. Technical Paper 48. Ministry of Natural Resources and Tourism, Dar es Salaam, Tanzania.
- Lövbrand, E., T. Rindejäll, and J. Nordqvist. 2009. Closing the legitimacy gap in global environmental governance? Lessons from the emerging CDM market. *Global Environmental Politics* 9(2):74-100. <http://dx.doi.org/10.1162/glep.2009.9.2.74>
- Lund, J. F. 2007. Is small beautiful? Village level taxation of natural resources in Tanzania. *Public Administration and Development* 27(4):307-318. <http://dx.doi.org/10.1002/pad.467>
- Miles, L., K. Kabalimu, B. Bahane, C. Ravilious, E. Dunning, M. Bertzky, V. Kapos, and B. Dickson. 2009. *Carbon, biodiversity and ecosystem services: exploring benefits. Tanzania*. Prepared by United Nations Environment Programme World Conservation Monitoring Centre, Cambridge, UK, & Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. UN-REDD Programme, Tanzania.

- Milledge, S. A. H., and R. Elibariki. 2005. *The status of logging in Southern Tanzania*. TRAFFIC East and Southern Africa, Dar es Salaam, Tanzania.
- Mukama, K. M. 2010. *Forest stratification and carbon stock in Angai Vilages Land Forest Reserve*. Thesis, Sokoine University of Agriculture, Morogoro, Tanzania.
- Murdiyarso, D., and M. Skutsch. 2006. *Community forest management as a carbon mitigation option: case studies*. CIFOR, Bogor, Indonesia.
- Murray, J. P. 2009. *Social and economic implications of a REDD project: a case study of a community forest in Madre de Dios, Peru*. SUTROFOR Thesis, University of Padua, Padua, Italy.
- Mustalahti, I. 2007. Msitu wa Angai: Haraka, haraka, haina baraka! Why does handing over Angai forest to local villages proceed so slowly? Pages 177-196 in J. Gould and L. Siitonen, editors. *Anomalies of Aid*. Institute of Development Studies, University of Helsinki, Helsinki, Finland.
- Mustalahti, I. 2009. Sustaining participatory forest management: case study analyses of forestry assistance from Tanzania, Mozambique, Laos and Vietnam. *Small-Scale Forestry* 8:109-129. <http://dx.doi.org/10.1007/s11842-008-9072-0>
- Mustalahti, I., and J. F. Lund. 2009. Where and how can participatory forest management succeed? Learning from Tanzania, Mozambique, and Laos. *Society & Natural Resources* 23:31-44. <http://dx.doi.org/10.1080/08941920802213433>
- Muungano Wa Hifadhi Endelevu Ya Msitu Wa Angai (MUHIMA). 2010. *Memorandum of Understanding for union of sustainable management of Angai forest*. MUHIMA, Liwale District Council, Tanzania.
- Nussbaumer, P. 2009. On the contribution of labelled certified emission reductions to sustainable development: a multi-criteria evaluation of CDM projects. *Energy Policy* 37:91-101. <http://dx.doi.org/10.1016/j.enpol.2008.07.033>
- Okereke, C., and K. Dooley. 2009. Principles of justice in proposals and policy approaches to avoided deforestation: towards a post-Kyoto climate agreement. *Global Environmental Change* 20:82-95. <http://dx.doi.org/10.1016/j.gloenvcha.2009.08.004>
- Paavola, J. 2008. Livelihoods, vulnerability and adaptation to climate change in Morogoro, Tanzania. *Environmental Science & Policy* 11:642-654. <http://dx.doi.org/10.1016/j.envsci.2008.06.002>
- Parker, C., M. Trivedi, N. Mardas, and A. Mitchell. 2008. *The little REDD+ book*. Global Canopy Program, Oxford, UK. [online] URL: <http://www.globalcanopy.org/materials/little-redd-book>
- Peluso, N. 1992. *Rich forest, poor people. Resource control and resistance in Java*. University of California Press, Berkeley, California, USA.
- Phelps, J., E. L. Webb, and A. Agrawal. 2010. Does REDD+ threaten to recentralize forest governance? *Science* 328:312-313. <http://dx.doi.org/10.1126/science.1187774>
- Rafli, T. P., G. Usher, and J. O. Niles. 2007. *Reducing carbon emissions from deforestation in the Ulu Masen Ecosystem, Aceh, Indonesia*. Provincial Government of Nanggroe Aceh Darussalam, Aceh, Indonesia.
- Rainforest Alliance. 2010. *FSC certification keeps trees standing and forests intact: responsible forestry reduces emissions*. Rainforest Alliance, New York, New York, USA. [online] URL: <http://www.rainforest-alliance.org/publications/fsc-climate>
- REDD-net. 2010. *The impact of REDD+ on poverty reduction*. REDD-net, Overseas Development Institute, London, UK. [online] URL: <http://redd-net.org/resource-library/the-impact-of-redd+-on-poverty-reduction>
- Seymour, F. 2009. Forests, climate change and human rights: managing risks and trade-offs. Pages 207-237 in S. Humphreys, editor. *Human rights and climate change*. Cambridge University Press, Cambridge, UK. <http://dx.doi.org/10.1017/CBO9780511770722.009>
- Sikor, T., J. Stahl, T. Enters, J. C. Ribot, N. Singh, W. D. Sunderlin, and L. Wollenberg. 2010. REDD-plus, forest people's rights and nested climate governance. *Global Environmental Change* 20:423-425. <http://dx.doi.org/10.1016/j.gloenvcha.2010.04.007>
- Sunseri, T. 2005. 'Something else to burn': forest squatters, conservationists, and the state in modern Tanzania. *Journal of Modern African Studies* 43(4):609-640. <http://dx.doi.org/10.1017/S0022278X05001242>
- Sunseri, T. 2009. *Wielding the axe: state forestry and social conflict in Tanzania, 1820-2000*. Ohio University Press, Athens, Ohio, USA.
- Tanzanian Forestry Working Group (TFWG). 2010. *Options for REDD in Tanzania: key design issues for the national REDD strategy*. Brief 2. Tanzanian Forestry Working Group, Arusha, Tanzania.
- United Nations Framework Convention on Climate Change (UNFCCC). 2010. Decisions adopted by COP 16 and CMP 6. Cancun Climate Change Conference, UNFCCC, Bonn, Germany. [online] URL: http://unfccc.int/meetings/cop_16/items/5571.php
- United Republic of Tanzania (URT). 2002. *The Forest Act*. Ministry of Natural Resources and Tourism, Dar es Salaam, United Republic of Tanzania.

United Republic of Tanzania (URT). 2009. *National Framework for Reduced Emissions from Deforestation and Forest Degradation* (REDD). Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam, United Republic of Tanzania.

United Republic of Tanzania (URT). 2010. *National Strategy for Reduced Emissions from Deforestation and Forest Degradation*. Ministry of Natural Resources and Tourism, Dar es Salaam, United Republic of Tanzania.

UN-REDD. 2009. *UN-REDD Programme*. Food and Agriculture Organization, Rome, Italy, United Nations Development Programme, New York, New York, USA, United Nations Environment Programme, Nairobi, Kenya. [online] URL: <http://www.un-REDD.org>

Viana, V., M. Cenamo, G. Ribenboim, J. Tezza, and M. Pavan. 2008. *Juma Sustainable Development Reserve: the first REDD project in the Brazilian Amazon*. Fundacao Amazonas Sustentavel. Manaus, Brazil.

Vihemäki, H. 2009. *Participation or further exclusion? Contestations over forest conservation and control in the East Usambara Mountains, Tanzania*. Dissertation, Faculty of Social Sciences, Institute of Development Studies, University of Helsinki, Helsinki, Finland.

Watson, C., and S. Frankhauser. 2009. *The clean development mechanism: too flexible to produce sustainable development benefits?* Working Paper 2. Centre for Climate Change Economics and Policy and Grantham Research Institute on Climate Change and the Environment, London, UK. [online] URL: <http://eprints.lse.ac.uk/37605/>

World Bank. 2010. *Rising global interest in farmland. Can it yield sustainable and equitable benefits?* World Bank, Washington, D.C., UK.

Wunder, S. 2008. Payments for environmental services and the poor: concepts and preliminary evidence. *Environment and Development Economics* 13:279-297. <http://dx.doi.org/10.1017/S1355770X08004282>