Who Gains and Who Loses from Compensated Displacement from Protected Areas? The Case of the Derema Corridor, Tanzania

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Abstract
Increasing attention is being paid to the social impacts of the exclusionary nature of conservation, as well as the mechanisms and policies put in place to mitigate negative impacts. Yet, factors that condition the restoration of well-being among people whose access to resources has changed due to conservation are still poorly understood. In this article we present an analytical framework for studying the social impacts of conservation interventions, and factors affecting post-intervention livelihood rehabilitation. We use this framework to analyse the consequences of the displacement of farmers from the Derema Corridor in northeastern Tanzania, who were given monetary compensation to mitigate livelihood losses. Drawing from qualitative and quantitative data collected over two years following their displacement, we find that the conservation intervention contributed to local social differentiation. Women and the poorest farmers experienced the strongest negative impacts, whereas those who were previously better-off emerged as relative winners among those affected. For more fair and equitable social outcomes, we recommend that conservation planners give careful attention to identifying rights-holders entitled to compensation, promptly implement ex ante risk management mechanisms, and give careful attention to the most appropriate forms of compensation and support measures in the local political economy context.

Keywords: conservation, displacement, compensation, rights, livelihoods, impact, Derema Corridor, Tanzania

INTRODUCTION
Establishment of protected areas has long been a central strategy in efforts to conserve the biological diversity and ecosystem functions of the world’s tropical forests. This often involves human displacement or exclusion from resource use1.

In the past decades, exclusionary conservation has been under growing criticism regarding trade-offs between conservation and social development goals (Roe 2008; Sunderland et al. 2008). Various studies argue for and against negative social impacts of protected areas in different parts of the world, and the scope and characteristics of these impacts (cf. reviews by Brockington and Igoe 2006; Redford and Fearn 2007; Coad et al. 2008). These studies have sparked discussion and even contentious debates among conservation and development practitioners and academics (cf. Schmidt-Soltau 2009; Curran et al. 2010). As a consequence, a number of international finance and aid organisations that support conservation have adopted principles, policies, and programmes addressing local people’s rights and mechanisms available to redress
conservation-related displacement. Most policies call for timely, adequate, and fair compensation for lost assets and supportive livelihood rehabilitation measures so that the affected populations achieve at least pre-intervention levels of well-being (Cernea 2003; Siegele et al. 2009).

Yet the question still being asked is, why, despite progressive policies and principles, are problematic outcomes being reported more often than successful ones? In a recent paper, Dear and McCool (2010) draw attention to the people-and-parks paradigm and question why displacement is considered at all. For the purposes of this article, we accept that achieving conservation goals may sometimes necessitate restricted human access to resources, but argue that in such cases it is important to strive for solutions that do not harm already vulnerable populations. We further propose that despite the voluminous debate on the justification and consequences of conservation-related displacement, insufficient attention is paid to ‘then what’ questions: what factors condition successful livelihood rehabilitation by people whose access to resources has changed due to conservation interventions?

We propose an analytical framework for tracking social impacts of conservation interventions, and use that framework to analyse the impacts and barriers to successful post-conservation livelihood rehabilitation in the case of the Derema Corridor in the East Usambara mountains, northeastern Tanzania. The establishment of the Corridor involved the displacement of hundreds of small-holder farmers from their farmland. The Tanzanian government, with assistance from international conservation organisations and bilateral donors, paid them monetary compensation to mitigate potential livelihood losses. Monetary compensation has been hailed one of the most efficient ways of advancing conservation (Ferraro and Kiss 2002), but empirical evidence on the social impacts of compensated displacement for conservation is scarce (but see Kabra 2003, 2009).

Our main question is whether or not the mitigation of negative livelihood impacts was achieved through monetary compensation, and the reasons for its success or failure. We draw from both qualitative and quantitative data on the livelihood impacts of compensated displacement from the Derema Corridor, tracing patterns of access to resources and compensation among the affected people, their livelihood strategies, and the outcomes experienced. Central to our research is to understand how the intervention affected different social groups, characterised by gender and wealth, in the affected villages.

**ANALYTICAL FRAMEWORK FOR IMPACT EVALUATION**

Conservation interventions do not operate in isolation but within the complex reality of socio-ecological systems. This makes it practically impossible to identify simple causal relationships between a single intervention and local livelihood outcomes. Therefore, it has been argued that instead of trying to isolate particular relationships for analysis, evaluations should be focused on interactions between different variables, changes triggered, and patterns of outcomes. Such an approach can maximise learning from the often-surprising outcomes of those interactions (Preskill 2009).

Impact evaluations seldom produce absolute ‘truths’ because the appropriate questions to be asked and answered are specific to cultures and organisations (Preskill 2009). Outcomes also vary according to the point in time at which the evaluation is carried out. We draw from the conceptual approach of Slootweg et al. (2001): ‘impact’ is something felt or experienced in a physical or cognitive (perceptual) sense, whether at the level of individual, household, or community. This approach allows us to identify impacts that are particular to the aspirations of actors in the local socio-cultural context, as well as impacts which are more measurable according to certain pre-defined, internationally-accepted indicators of well-being.

Figure 1 displays our conceptual framework of the social change processes that are triggered by conservation interventions. Access to resources, including forest and agricultural land, is a key factor shaping rural livelihood strategies. Access depends upon rights and agency. Rights are social claims to benefit streams that are defined by institutions such as rules, norms, and conventions; agency is defined by the capabilities and means that enable actors to claim and exercise their rights. Actors, including groups, can actively and strategically employ the resources at their disposal to promote their own interests. These resources include knowledge, authority, identities, and social relations. Access to resources and livelihood outcomes are also conditioned by the broader context that encompasses local biophysical conditions, markets, and policies (Scoones 1998; Ellis 2000; Ribot and Peluso 2003).

Following the sustainable livelihoods approach (e.g., Scoones 1998, 2009; Ellis 2000), livelihood strategies are achieved through access to a range of resources (which can be called ‘assets’ once accessed) and activities that are combined in particular social-institutional contexts. It is important to note that these contexts are inherently dynamic. Outcomes and impacts thus represent snapshots of the situation at a certain point in time, from the particular angle taken in the evaluation.

Sustainable livelihoods approaches have often been criticised for failing to account for the political dimensions of social processes (Scoones 2009). In our approach, the concepts of access, agency, and livelihood strategies are interwoven in the analysis of social change processes triggered by interventions. The impacts of interventions can be examined in terms of outcomes for material and social well-being or social-political institutions. Here we focus on interactions between compensation payments, resource access, livelihood strategies, and post-intervention livelihood outcomes.

Conservation of an area usually introduces a new set of rules, altering the institutional framework that defines local actors’ rights to resources. Outcomes in terms of changed access are also shaped by the actors’ agency in negotiations over the conditions of conservation (Rantala and Vihemäki 2011). Likewise, the actors’ rights and agency condition access to
Compensation, a new monetary resource intended to replace lost access to natural resources.

The responses and capacity of actors to react to changed access to resources can be described in terms of resilience: i.e., the ability to cope (temporarily adjust in the face of change) or to adapt (longer-term shifts in livelihood strategies due to changed circumstances) (Scoones 1998; Ellis 2000). Substitution capabilities are critical for resilience: a low ability to substitute one type of asset with another decreases resilience (Ellis 2000: 42; Igoe 2006). Furthermore, post-intervention access to resources and the conditions for livelihood rehabilitation depend upon the restitution of the lost resources and any additional transition or transaction costs (Pearce and Swanson 2008). Therefore, even from a purely economic perspective, monetary compensation for the measurable market value of lost physical assets may not be enough to achieve successful livelihood rehabilitation (Cernea 2003). Furthermore, it may be difficult to monetise certain types of resources that condition resilience, such as human and social capital4. These observations point to potential challenges for achieving post-intervention livelihood rehabilitation through monetary compensation alone.

Since we aim to identify impacts on different social groups among those affected, we need to emphasise the following aspects in our analysis. First, interpretations on what constitutes ‘rights’ to resources and compensation are likely to vary in legal pluralist contexts where different normative systems exist side by side (Meinzen-Dick and Pradhan 2002). That is, claims based on customary law, which often determine de facto access in rural conditions, versus claims based on statutory law may be conflicting, or recognised differently by different actors. To add another layer of complexity, in many developing countries the different socio-legal orders may have become intermingled during decades of colonial and post-independence rule, making it difficult to identify the merits or demerits of either system for the resource access of different social groups. Actors may also flexibly draw from different orders to advance their interests, described as ‘forum shopping’ (Whitehead and Tsikata 2003). All of this has implications for the processes through which rights are defined and rights-holders identified.

Second, an important reservation is that social actors usually possess uneven material and symbolic resources, and the means of defending or claiming them. Relations of gender, ethnicity, religion, cultural identity, power, and authority govern the distribution of access, patterns of work and division of labour, distribution of income, and dynamics of consumption and accumulation (Yngstrom 2002; Scoones 2009; Sikor and Lund 2009). This further highlights the need to address the way that eligibility for compensation is defined and the compensation mechanisms applied, especially if we are concerned with equity and mitigating harm to vulnerable social groups that may not have the ‘voice’ to defend their interests.

The Derema case entailed two processes of compensation transfer to farmers who were displaced from the Corridor. The first one was more visible. The conservation authorities paid individual farmers who were defined as ‘farm owners’ in the planned Corridor, and eligible for compensation under the administrative processes that were followed. The authorities

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4 Human and social capital are critical for resilience, and their monetisation is challenging.
also implicitly assumed another process to take place, although they had little control over it: that those who collected the payments—mostly male household heads—would share the compensation with other family members displaced from the appropriated land. These two tiers of the compensation process follow from the dominant practices of studying and registering rural landholding that apply the often abstract concept of ‘household’ as the primary unit, subordinating women as wives, sisters, daughters, and widows to the decisions of household heads in matters related to land and farming (Yngstrom 2002). Our analysis covers both processes and their implications for the land and livelihood security outcomes experienced by those affected, with gender as an explicit category of analysis.

CASE STUDY: MATERIALS AND METHODS

Study area

The East Usambara mountains in northeastern Tanzania are part of the Eastern Arc mountain range, renowned for the endemic biodiversity of their forests (Rodgers and Homewood 1982; Burgess et al. 2007). The East Usambaras are also home to people who have been practicing agriculture on the mountain slopes, especially the dominant ethnic group Shambaa, for hundreds of years (e.g., Feierman 1974).

Since the start of the colonial era in the late nineteenth century, the East Usambara landscape and the livelihoods of its people have been increasingly influenced by external interests. Forests were first cleared for export-oriented plantation agriculture, initially coffee and subsequently tea in the uplands and sisal in the lowlands, and for timber extraction. At the same time, several forest reserves were established to protect environmental values and serve commercial interests (Hamilton and Bensted-Smith 1989; Conte 2004). Many Shambaa found work on the tea estates to be arduous with low returns, and the estates had to import labour from other areas. In-migration to East Usambaras escalated in the 1940s and 1950s due to work opportunities in the tea estates and timber industries. These developments contributed to forest clearing and agricultural expansion, along with an expansion and diversification of the human population (Stocking and Perkin 1992; Conte 2004).

The history of intensifying natural resource use and conservation has created a mosaic of forest and agricultural land uses. Most of the submontane forest is contained within several government forest reserves and two nature reserves, Amani and Nilo (Figure 2). While retaining large patches of forest to maintain the optimal microclimate for tea, the tea estates have also replaced some of their natural forest with eucalyptus plantations to produce fuel wood for tea drying. Small-holder farming covers the areas between the reserves and tea fields.

Expansion of small-scale farming is seen as the biggest driver of forest fragmentation, a threat to the endemic biodiversity and ecosystem functioning (e.g., URT 2006). Conservation of the mountain forests has dominated official management strategies since the 1990s. One of the approaches suggested to counter the threat of fragmentation involves the creation of conservation corridors between the biggest forest blocks confined within reserves (Newmark 1993; Tye 1993). While some considered it the largest tract of unprotected forest in the East Usambaras (e.g., Newmark 1993; Tye 1993), the Derema area was characterised as being almost completely under cultivation of cardamom and subsistence crops by the 1990s (Johansson and Sandy 1996). Cardamom was first introduced during the German colonial period and gradually adopted by small-scale farmers as a profitable cash crop (Vihemäki 2009). It is grown in agroforestry systems in which the undergrowth of the rainforest is cleared and large trees are left to provide shade for the cardamom plants. This is suggested to initiate a chain of gradual clearing of trees and conversion to more open land uses after cardamom has exhausted soil fertility (Stocking and Perkin 1992), and is hence considered one of the main drivers of forest degradation and deforestation outside the reserves.

Figure 2
Map of the East Usambara mountains and Derema Corridor

Map courtesy of Dr. Jaclyn Hall, September 2011
Most of the planned Corridor was the jurisdiction of five villages: IBC Msasa, Kwezitu, Kambai, Kwemdimu, and Kisiwani (URT 2006). Jambiya and Sosovele (2000) conducted a social impact assessment (SIA) in the five villages in 2000, prior to the intervention. They found that 99% of the population to be affected depended on agriculture as their most important source of income. Cardamom was their most important cash crop, followed by other spices. Subsistence crops such as yams and banana were intercropped with cardamom, and maize and beans were grown in more open areas outside of the planned Corridor. While many also kept livestock or were engaged in small businesses, 45% stated that they had no means of income apart from farming. Nearby tea estates employed only a handful of local youth (Jambiya and Sosovele 2000). Thus, at the start of the Corridor establishment, the livelihood strategies of the people could be characterised as land-based and highly specialised in the farming of spice cash crops.

The land access of the Derema farmers was based on both recent land allocations by village leadership as well as traditional management by local Shambaa kinship groups. In some cases, the family had been allocated the land by the government in late 1960s - early 1970s (Jambiya and Sosovele 2000). As was (and still is) common in Tanzania, no one had a title deed for their land. Boundaries of land parcels are based on mutual recognition by neighbours rather than formal village records. The average farm sizes in the East Usambara uplands range between 2 and 3.5 ha, depending on the village (Reyes et al. 2005; Bullock et al. 2011). A third of the people affected by the Corridor had landholdings between 0.4 and 1.8 ha, while 6% accessed over 8 ha. Total land access consisted of one or two plots for the majority of those affected, including farms outside the Corridor area (Jambiya and Sosovele 2000: 13).

Current practices regarding land rights in the East Usambara villages are a mix of customs based on lineage tenure by the Shambaa and immigrants from different ethnic groups, and modern land administration by formal village authorities since the land law reforms of the 1990s (Rantala and Lyimo 2011). The current combination of individual and lineage tenure generally resembles what can be observed elsewhere in Tanzania (e.g., Odgaard 2002; Yngstrom 2002), but also forms a highly nuanced picture which may vary between villages and among households (Rantala and Lyimo 2011). Imposing a uniform concept of land ownership in this context is likely to disadvantage actors that primarily depend on familial and other social relations for access. In general, alienation rights (selling/lending/bequeathing land) are retained by men, while women may have extensive use and management rights and independently cultivate and generate income from land accessed through their husbands or fathers. Children inherit land from their fathers. Both male and female children may inherit land, but women normally receive smaller portions. A widow may access land for farming, especially while her children are young, but merely in the role of a temporary caretaker. A father’s inheritance is typically distributed while he is alive, so that family members belonging to different households cultivate parcels that are still under the formal ownership of the father. Male relatives may also use their traditional right to re-allocate fathers’ inheritances posthumously to the disadvantage of women. Women’s control over their land is often challenged in cases where land is to be exchanged for money, such as in a land sale—or in compensated appropriation for conservation. But the recognition of a woman’s land rights also depends on lineage traditions and power dynamics, and the ability of a woman to defend her access (Rantala and Lyimo 2011; cf. Odgaard 2002; Yngstrom 2002). During the SIA, women specifically expressed concerns about decreased access to land and control over monetary compensation as a consequence of the Corridor establishment (Jambiya and Sosovele 2000: 32–35).

### Establishment of the Corridor

The establishment of the Derema Corridor was initiated in 1999–2000 during the East Usambara Conservation Area Management Programme (EUCAMP), funded by the Government of Finland and the European Union, and implemented by the Tanzanian Ministry of Natural Resources and Tourism (MNRT) (Figure 3). In addition to the SIA, meetings with village leaders were organised by EUCAMP representatives to inform the villagers about the plans for the Corridor (URT 2006). Farmers’ initial reaction to the conservation plan was resistance, but promises of compensation contributed to an agreement (Jambiya and Sosovele 2000; Vihemäki 2009).

In 2001, EUCAMP was advised by the Ministry of Lands to adhere to the new Village Land Act and associated Land Regulations of 1999 (URT 2006). The Derema area was eventually classified as village land (URT 2006), meaning that customary land rights in the area were legally recognised as private land rights even when not registered. While these rights can be revoked by the state for public benefit, compensation for existing land rights is required by the law. Only farmland was included in the Corridor plan; the boundaries were drawn to exclude settlements (URT 2006).

The compensation was calculated using an ‘annual income per crop’ approach (Pohjonen 2002), estimated as the income stream lost until new crops are mature enough to replace the income from the crops lost (URT 2006). Compensation was thus only paid for the standing crops, not the land itself, despite the requirements of the Village Land Regulations for compensation for lost farmland and improvements according to market value, as well as for communal land. The crop compensation approach was in line with the former land law which was still in effect when the Corridor planning started, and it was never fully revised during the compensation process.

Perhaps due to uncertainty about how customary land ownership was to be established, or simply out of unpreparedness for the task, EUCAMP applied a very rudimentary method to identify those eligible for compensation. It involved calling farmers onto their fields on certain days as teams of valuers surveyed the area. Each plant was counted and recorded on a form together with the person’s reported name and photograph.
No other data concerning the individuals who showed up (such as form of access to the plot of land, relationship to land owner) or the farms (e.g., area) were recorded (URT 2006: 18–19). The farmers later described a two-step process involving the farm visit, then signing the forms at the village office. Although the person actually farming the land might have been present in the field, it was often the household head who signed up as the owner. It was also claimed that the valuation and registration approach enabled outsiders to access compensation illicitly (Rantala and Vihemäki 2011).

EUCAMP registered the farmers on the boundary of the planned Corridor when the 956-hectare area was demarcated in mid-2001 (EUCAMP 2002; Pohjonen 2002). Crops in that boundary area were slashed, and the following year the owners were paid compensation at a flat rate based on farmers’ estimates of yield per plant (URT 2006).

In mid-2002, farmers with land inside the Corridor were registered. Based on the rate paid for the boundary crops, compensation owed to them turned out to be many times higher than the project had anticipated. The number of plots in the Corridor was much higher than the number estimated during the establishment of the boundary (URT 2006). Hence, a new method was applied in which plants recorded on each farm were classified into payment categories according to their maturity and expected yield. Very little compensation was paid for seedlings, while higher payments were made for mature plants. The total sum of compensation needed was changed several times during the review process (Pohjonen 2002; URT 2006).

Despite the downscaling of the compensation, EUCAMP closed in 2002 without sufficient funds to finalise the payments. In 2005, MNRT paid each farmer about half of the pending compensation (URT 2006). Final compensation payments were paid in March-May 2008, after the Tanzanian government had secured funding from the World Bank. The long delay in the process caused marked frustration and resentment among the affected people (Rantala and Vihemäki 2011).

Hence, money was the form of compensation availed, and people were left to their own devices to decide how to use it. No facilitation of investments or mechanisms to monitor intra-household allocation and distribution of the money were put in place. Payments were made as personal cheques to the people listed during the valuation, as “requested by the farmers” (Pohjonen 2002), probably the handful of male farmers and village leaders who had attended the first planning meetings. Women’s pleas that the compensation be paid individually to each spouse (Jambiya and Sosovele 2000) were ignored.

As part of the agreement for the World Bank grant, a resettlement action plan (URT 2006) was prepared according to the World Bank Operational Policy (OP) 4.12 on resettlement. The plan included “income restoration measures” to target the poorest, most affected farmers. These were mainly alternative income generating activities: dairy cattle, beekeeping, butterfly farming, and fish ponds. In addition to the financial compensation, 3-acre farm plots on former sisal estates in the lowlands surrounding the East Usambara mountains (>10 km from the affected villages) were to be given to interested farmers (URT 2006).

**Methods**

In the absence of comparable data collected at the beginning of the Derema intervention, we used a mix of quantitative and qualitative research methods to piece together a detailed recall of the situation before and during the conservation and compensation process, and a year after the final compensation payments were made. Collection of data on changes linked to restricted access and compensation in 2008 and 2009 was...
focused on the subvillages of Makanya in IBC Msasa and Antakae in Kwezitu, which were perceived by local key informants to be the most severely affected by displacement from the Corridor. Makanya is located in the middle of the Corridor, and most inhabitants lost farms (Makanya subvillage chairperson, January 2008). Antakae is located adjacent to the Corridor on its northwestern side (Figure 2).

Eight semi-structured gender-disaggregated group and key informant interviews were carried out between January 2008, when compensation was still pending, and March-May 2008 when fieldwork coincided with the final payments. In addition, we engaged in direct observation of farmers’ meetings related to the conservation and compensation process.

In September and October 2008, a total of seven key informant and group interviews were conducted along with a structured survey to collect individual and intra-household data. A minimum of 70 households were randomly drawn from a sampling frame including all households in each of the two villages. The sample was divided into wealth classes to obtain information on how impacts of the Corridor were distributed between economic strata in the villages. A panel of key informants classified the sampled households in each village into groups of ‘high’, ‘middle’, and ‘low’ wealth status (indicator A) according to indicators that they had previously defined based on values shared by most villagers. The same panel determined different ways in which households might have benefited or incurred costs due to the Corridor establishment, and indicated the households in the random sample to which the described effects applied. The households were then further classified into ‘mostly benefited’, ‘neutral’, and ‘mostly incurred costs’ (indicator B). Forty households were then assigned into the resulting nine-cell sampling matrix (three values for indicator A times three values for indicator B) in the order that they had entered the random sample, so that the original proportions of each wealth class in the random sample were maintained, but a representation of the three values of indicator B was achieved, if possible.

The remaining 30 households formed a reserve from which substitute households could be drawn if a primary household could not be interviewed despite attempts on 3–4 consecutive days. The sample is presented in Table 1.

Both spouses of a household were interviewed individually to enable comparison of responses and shed light on intra-family transfers of compensation. In polygamous families, the first wife or the wife with whom the husband resided was interviewed. The respondents were instructed to only answer a question on their own behalf and not for the overall situation of the household. They were specifically told when the question concerned other members of the household.

A questionnaire was designed to elicit data regarding changes in access to resources (land, forest), access to compensation, livelihood strategies, and perceived impacts vis-à-vis respondents’ attributes and social and familial relations. The survey protocol, including random sampling, stratification, and interviewing, was first pre-tested and practiced in a third village, which allowed adjustments and improvements to the method and the questionnaire. A team of six enumerators (two local research assistants and four recent University of Dar es Salaam graduates) administered the survey in Swahili, spoken by virtually all in the study villages, under the supervision of the lead author of this article.

In September 2009, in-depth semi-structured interviews were conducted with 31 respondents to the 2008 survey to observe further changes and impacts a year after the final compensation. Half of those respondents had received no or very little compensation for lost access. Some were women whose husbands received compensation but they were not aware of this and personally considered that they had lost land without compensation.

In addition, one mixed group and four gender-disaggregated focus group discussions were convened in September 2009 to elicit feedback on the preliminary results. This helped to complement the previous data, clarify apparent paradoxes of data, and crosscheck information.

Secondary data were used as material and for crosschecking some of the information. For example, compensation sums mentioned by respondents were compared to the official records of paid compensation at the district office to determine the accuracy of respondent recall.

**RESULTS**

The most acutely felt changes associated with the Derema displacement and compensation intervention were related to access to land, access to compensation, and income. In this section we discuss the ways that old and new assets were combined for the post-intervention livelihood strategies, then summarise the impacts on the different social groups.

**Changes in access to land**

In the two study villages, 61% of the respondents to the 2008 survey (79% in Makanya and 47% in Antakae) lost farmland

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<th>Table 1</th>
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<td><strong>Household survey respondents, 2008</strong></td>
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<td>Antakae</td>
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<td>Makanya</td>
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to the Derema Corridor. The median area of farmland lost to the Corridor was one hectare; the distribution was skewed towards smaller areas within the range of 0.1–5.0 hectares. Table 2 summarises how the Corridor establishment affected respondents in the different wealth classes in terms of land access.

Although the area of land lost was not the basis of the calculation of compensation, we found that there was a significant positive correlation between the area of farmland lost and the total compensation received. Furthermore, we found a strong correlation between the area of land presently accessed and annual income from farming, suggesting a relationship between post-intervention land access and livelihood outcomes.

The areas of farms that men and women reported to have lost were similar, a median of 1 ha for women and 1.2 ha for men. This corresponded with the 2008 survey data on land access; areas of land reported to be personally owned by female respondents were slightly smaller (median 1.6 ha) than those personally owned by male respondents (median 2 ha). This 25% difference was economically significant, though not statistically significant. It is possible that when answering the question on land lost to the Corridor, despite our intention to capture only land personally controlled, some female respondents also considered land accessed through co-ownership with their spouse, or land borrowed from other family members.

### Access to compensation: direct transfers

In 2008, 53 of the 134 survey respondents (40%) in Makanya and Antakae had received direct monetary compensation, that is, compensation paid by the authorities, for farms lost in the Derema Corridor. Nearly all the interviewed men (95%) but only 30% of the women who had lost part or all of their land to the Corridor stated that they had received compensation.

The median difference between total compensation reported by respondents and compensation paid according to district records was TZS 153,610 (USD 128, n=41). The largest differences were mainly for recipients of relatively large compensation payments. The median difference between sums reported to have been received as final payment in 2008 and the payment records was negligible; TZS 42,909 (USD 36). Thus the compensation sums reported by the respondents were considered fairly accurate and were used in the following analysis.

The differences in median compensation sums between the wealth classes are presented in Table 2. Those in the highest wealth class received the largest compensation sums, those in the middle wealth class the second largest sums (with considerable variance), and those in the lowest class received the smallest compensation. The median compensation in the highest wealth class was seven times higher than that in the lowest wealth class. Median compensation also varied by gender (Table 3). Compensation received by both men and women was highly skewed towards smaller sums.

### Access to compensation: indirect transfers

The results above show that similar proportions of male and female respondents lost access to similar areas of land, while far more men than women received compensation. The reason for the discrepancy is the compensation method. Although a few women registered for compensation directly, for most, their farms became re-labelled in the process as property of the ‘household’, in practice that of the household head, who registered for and received compensation.

The women who depended entirely on intra-family distribution of compensation for the land that they lost access to can be roughly divided into two categories. The first category is elderly widows whose compensation payments were taken over by their children or male relatives of their late husband, usually with the widow’s consent (n=4). In the second, larger category (n=21), the lost farm had been co-owned with or borrowed from a family member: husband, father or father-in-law, who registered for compensation and did not share it with the respondent.

Table 4 presents the results of a pair-wise comparison of the answers of the household head and spouse in households where only the household head received compensation (n=32). All household heads were male in these cases.

Although the wives’ knowledge of compensation was generally higher in Makanya than in Antakae, one third of the Makanya wives reported smaller sums than their husbands, and mentioned only some of the uses of the money listed by their husbands. For example, in six cases, the wife only mentioned house repair/construction, whereas the husband also mentioned, for example, buying new farmland.

When asked about the differences between the two villages, people suggested that they were related to Antakae being

### Table 2

<table>
<thead>
<tr>
<th>Percentage of those who lost land to the Corridor</th>
<th>Lowest</th>
<th>Middle</th>
<th>Highest</th>
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<tr>
<td>58% (n total lowest=36)</td>
<td>57%</td>
<td>100%</td>
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<tr>
<td>0.4 ha</td>
<td>1.2 ha</td>
<td>1.0 ha</td>
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<tr>
<td>Median total compensation* received</td>
<td>TZS 227,500 (USD 190)</td>
<td>TZS 360,000 (USD 300)</td>
<td>TZS 1,612,500 (USD 1,344)</td>
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</table>

*Total compensation = sum of all compensation received for all farms over the years (1–4 farms/respondent; including boundary compensation in 2001, partial compensation in 2005, and/or final compensation in 2008). Exchange rate used: USD 1 = TZS 1,200 (2008).

### Table 3

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<th>Median total compensation</th>
<th>Range</th>
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<td>Women (n=11)</td>
<td>TZS 300,000 (USD 250)</td>
</tr>
<tr>
<td>Men (n=42)</td>
<td>TZS 642,500 (USD 535)</td>
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</tbody>
</table>
The most common uses of compensation money differed between the wealth classes. For the lowest wealth class, which received the smallest sums, the most frequent uses were consumption and building. For the middle class, these were also the most common uses, but respondents also mentioned buying alternative farmland (27%), sponsoring family members’ education (15%), buying livestock (12%), or saving some of the money (12%). In the highest wealth class, the most common use was purchasing farmland (mentioned by 70%), often combined with investment in building and business activities.

Although the number of women who received compensation was small, disaggregation of data by gender indicates some interesting differences. Whereas the three most common uses for men (n=42) were consumption (52%), building (52%), and purchase of alternative farmland (38%), women (n=11) used their compensation on school fees (36%), consumption (27%), farmland (27%), and building activities (18%). Only three male respondents mentioned school fees.

### Post-intervention livelihood strategies

Six months after the final payments were made in 2008, most
people (92%) who were affected by lost access to land still considered farming to be their most important livelihood activity. The most common livelihood response was to continue cultivating their remaining land.

Villagers insisted that for the majority, the compensation was inadequate to buy alternative farmland. This claim is supported by survey results showing that only the highest wealth class, which received the largest compensation sums, made investments in land. The median amount used for buying land (Table 5) was greater than the median compensation received by the lowest and middle wealth classes (Table 2), and well above the median compensation received by women (Table 3).

Nevertheless, other factors may have affected investments in land. The idea of providing affected households with substitute land had been on the agenda of the ‘resettlement’ project since 2007, although it was still unresolved as of September 2011 when this article was drafted. Knowledge of the prospect of land re-allocation may have affected decisions about the use of final cash payments. In 2008, some farmers scorned the idea of accepting farmland in the lowlands. At least half of the farmland that was purchased with compensation money was located in the uplands, in the same village or in neighbouring villages. In Makanya village, those who received large compensation sums and could afford the high price for prime cardamom land were buying plots immediately adjacent to the Corridor. By late 2009, when cash had been used for other needs, attitudes were markedly different, suggesting near desperation to access any new farmland.

Those who received less compensation or otherwise had less cash available had started farms on steep slopes at lower elevations, typically dedicated to the cultivation of maize and beans. Some of the fields had previously been fallow, and cultivated again after the loss of access to the Corridor plots. During a qualitative survey conducted in September 2009, we observed widespread burning for the preparation of farms in these areas. Newly planted and often moribund cardamom saplings were observed in many areas where conditions were less conducive for cardamom. This observation, together with evidence of the investments on cardamom plots by those who could afford it, suggests that cardamom farming was still seen as an attractive livelihood option by the local farmers.

The time lags in the displacement and compensation process meant that changes in access to land and livelihood strategies were gradual. Negotiations between the project and farmers had resulted in an agreement that crops could still be harvested, but cardamom plots were not to be maintained. Many people continued harvesting their plots in the Corridor until at least as late as 2009, although yields and subsequently income gradually declined due to lack of husbandry. Some farmers also contested the legitimacy of farming restrictions until the final compensation payments were completed (Rantala and Vihemäki 2011). During a transect walk in the Corridor in January 2008, we observed that few farms were still being maintained, while most farms had been abandoned and forest was regenerating.

During the eight-year lag between the demarcation of the Corridor boundaries and the completion of final compensation payments, the forest converted from a mixture of communal and private property to de facto open access. The local tenure rights were easily dismissed by people from other villages who entered the Corridor and harvested cardamom for sale. The affected farmers complained bitterly about ‘cardamom thieves’. Even violent fights between farmers from Makanya and Antakae were reported.

Some of the wealthiest farmers purchased land in the lowlands with their high compensation sums, on former sisal estates surrounding Muheza town. The purpose was most often the cultivation of oranges; a few had also shifted to large-scale cultivation of maize. In 2009, most were still working to establish the new cultivations.

Sixty per cent of those affected by displacement had a secondary livelihood activity in 2008, up slightly from the 55% reported in the SIA survey in 2000. The secondary sources of income differed by wealth class. Many of those in the highest and middle wealth classes were engaged in buying and re-selling other people’s cash crops, mostly cardamom and other spices, but also sugarcane and timber. Some had started kiosks and shops with the compensation money. In the lowest and middle classes, respondents earned wages working on neighbours’ farms or, to a lesser extent, at the tea estates.

Very few of those affected were engaged in non-farm wage labour in 2008 and 2009. It was explained in group discussions that two things impede those affected from resorting to wage labour on the nearby tea estates. First, there is the strong cultural identity of the Shambaas as farmers (cf. Feierman 1974; Conte 2004); people would rather ask for work on neighbouring farms as a survival strategy (group discussion, Makanya, September 2009). Second, it was suggested that the tea companies prefer outside workers who migrate to the area and depend on the company fully for their livelihoods, instead of local people who consider this as a temporary activity and revert back to farming at the first good chance.

The planned alternative income generating activities (URT 2006) had not been facilitated by the end of the resettlement action plan (RAP) project in 2010. Implementation of the RAP had focused on the completion of the final compensation payments, and later the efforts to allocate alternative farm plots to the farmers.

Livelihood outcomes and other impacts

The differentiated livelihood strategies were reflected in outcomes regarding annual income by the three wealth groups between October 2007 and September 2008. Those in the highest wealth class were mainly deriving income from old cardamom farms, which was used to develop new farms acquired with the compensation money. Their average income was four times higher than the average income of the other two groups. This applied to both farm and off-farm income, although non-farm self-employment (business activities) generated the most income for them. The proportion of farm income in total income was lower (54%) in the highest wealth
group than in the middle group (69%), or the lowest wealth group (77%).

After losing the cardamom farms and not being able to replace them, farming among the lowest wealth group consisted largely of lower value crops such maize and beans by 2009. This was already reflected in income data from 2008, which showed that the lowest wealth class derived more farm income from annual than perennial crops (Table 6). For the middle wealth group, mixed farming of perennial and annual crops generated the most income in 2008, when many of them still harvested cardamom in the Corridor. There were no significant differences in income between the 2008 and 2009 results in any of the groups.

Respondents reported no changes in the number of children sponsored to secondary school, diet, or health of household members between 2008 and 2009. Some interviewees mentioned decreasing the amount of protein in their diet or entirely skipping meals as a coping strategy in 2009. At the same time, there was also food insecurity due to weather events. Incidents of theft of food crops—in addition to cardamom—were reported in Makanya in 2009.

A use of the compensation money that did not directly appear in the survey data, or might have been included as part of ‘consumption’, was alcohol. Although we could not quantify this, the stories were rich. In addition to drinking in the village, men would sometimes disappear in Muheza town for days or weeks following receipt of cash compensation. For example, two of those interviewed who received large compensation sums in 2008 had failed to finish building their new houses, had no compensation money left, and were subsisting of farm wages in 2009. Whereas they themselves lamented ‘unwise’ investments, other people suggested they had spent much of their compensation amount on drinking.

For women, this impact was acutely felt. Men often spent money on other women while drinking away from home. In both villages, key informants and group discussants could name at least four women whose families had been broken after the compensation payments. The story of one of them from Antakae village is an example:

My husband was working at the tea company and I was taking care of the farm with my two eldest children. I only found out about the appropriation and compensation when other people came to get my husband to go with them to town to collect the money. I do not know the sum he received—he just spent it all down there. He never consulted me or told me anything, and I could not ask, as man is the head of the family. Six years prior, he had taken another wife in Lushoto [West Usambara mountains]. There was already a first wife in the village, I was the second. He lived with me. I never received him again after that day. He went to live in Lushoto and just came to visit the children sometimes, but he did not sleep here! This year he died and they buried him in Lushoto. After that, they [husband’s relatives] came and wanted to ‘inherit’ me. I refused, and the land that was left was taken by the first wife. I bought one acre with my son here in the valley where we have started to grow vegetables.

In the absence of comparable data from prior to the intervention, we cannot measure quantifiable indicators that would tell us if some groups were directly impoverished as a consequence of displacement from the Corridor. However, clear trends are observable in our data regarding access and post-compensation livelihood strategies and perceived outcomes, summarised in Table 7.

The relative winners were characterised by earlier higher access to land, an entrepreneurial attitude, and long-term visions regarding their livelihoods, relating to a certain type of human capital, but not necessarily education. “I never went to school, so I worked the land. I like development” (male interviewee, Makanya, September 2009). They used access to compensation, which was higher than average, to realise pre-existing plans. Hence, they had the resources to shift to the lowlands and further diversify their livelihood activities, consisting of farming of different types of cash crops as well as business activities. They were generally the most content with the whole process. “For me, conservation was a blessing. I wish they took more farms in the uplands so that I would get more money for my business development” (male interviewee, Hale, October 2009).

A strong negative impact was felt among those who had previously accessed small farms and received small compensation payments. When the money was finally received after the long delay, it was used on consumption. In addition to cultivating the remaining smaller farms, many in this group resorted to occasional wage labour. “It has brought a huge negative impact because my farm is gone and you cannot buy another farm with that money. To be honest, if this exercise is repeated, it should be with a gun. This exercise has benefited the big people” (male interviewee, Makanya, September 2009).

In terms of the sustainability of the post-intervention livelihood strategies, true diversification only occurred in the highest wealth group. Resorting to wage labour in addition to farming is a temporary survival/coping strategy rather than risk-reducing diversification (Ellis 2000). The implications of diversification for sustainability also depend on the relationships between the activities (Ellis 2000: 61). For example, a strategy that combines farming and wage labour on neighbours’ farms usually means that a weather event, such as a drought, will negatively affect both income streams simultaneously. Similarly, combining farming and

### Table 6

<table>
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<th>Income derived from</th>
<th>Median income (TZS) October 2007–September 2008</th>
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<tr>
<td></td>
<td>Highest</td>
</tr>
<tr>
<td>Perennial crops only</td>
<td>1,043,000 (USD 869)</td>
</tr>
<tr>
<td>Mixed farming of perennial and annual crops</td>
<td>260,000 (USD 217)</td>
</tr>
<tr>
<td>Annual crops only</td>
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</tbody>
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trading of the same farm products is affected by droughts, market fluctuations, etc. In contrast, diversification involving farming in different agroecological zones, e.g., cardamom in the uplands and oranges in the lowlands, is potentially less vulnerable to shocks. It probably also explains the attraction of investing in rental houses in Muheza town, considered a steady, non-labour intensive income source.

Yet, the future of even the few ‘winners’ entails uncertainties. Some Derema farmers were starting orange farms on abandoned sisal estate land, which they had bought from former estate workers in 2008–2009. The workers had ‘taken over’ the land after the cessation of the sisal company activities and held no formal rights of occupancy. The interviewed farmers did not seem concerned about the fuzzy land tenure in their new location. “They already evicted us from the forest, they cannot evict us from here” (male interviewee, Muheza, September 2009). The formal allocation of former sisal estate land to the Derema farmers requires the revocation of the sisal estate title by the government. Under the current agricultural policy priorities in Tanzania, there may be competing demands for this land, such as large-scale agricultural development projects.

Women, in the aggregate, clearly lost out as a consequence of the conservation and compensation intervention. They were effectively blocked from accessing both land and compensation. Whereas previously they could harvest cardamom when financial needs arose, they had less access to and control over the cash compensation. In the current situation of decreased overall access to resources, the role of family and other social relations for their resilience is accentuated.

**CONCLUSIONS**

Our findings resonate with previously documented negative social consequences of conservation- or development-related displacement: poor preparation leads to delays, increased costs, and lost benefits, which negatively affect those displaced and undermine development objectives (e.g., Cernea 2003; Kabra 2009). The Derema case reminds us that progressive policies and good intentions alone are not sufficient to ensure equitable outcomes. The intervention strengthened local social differentiation by failing to account for the social relations and previous access to resources that conditioned access to compensation, livelihood strategies, and finally the post-displacement outcomes to different social groups.

Equitable compensation requires the identification of all those who depend on the resources for their livelihoods and incur costs from losing access to them. Complex land access patterns within households and kinship groups may make that identification difficult. Land registration based on Western concepts of ownership that do not capture dynamic local realities of land access has often proved devastating for women’s land rights in Africa (Odgaard 2002; Yngstrom 2002; Whitehead and Tsikata 2003). Concerted efforts should therefore be taken to acknowledge rights-holders in an area to be conserved, requiring an inclusive process and an understanding of the cultural factors influencing agency and access to resources. The findings of those studies need to be effectively operationalised in conservation and compensation plans. This did not happen in the Derema case, where the concerns of the women documented prior to the intervention played out in the same negative way that they feared.

Determining fair compensation is more difficult. From a purely legalistic point of view, compensation paid to the affected farmers did not follow the concept of fair and timely compensation as mandated by the Tanzanian land law and the World Bank policy. The perceptions and discourse of the Derema farmers on the legitimacy of the compensation changed over the course of the extended process (Rantala and Vihemäki 2011). Many of those affected perceived that the received compensation did not cover the incurred opportunity costs or transaction costs which restitution of the lost land and subsequent livelihood rehabilitation would have required after the long delay. Only the amounts received by the highest wealth class respondents matched those received by farmers in a similar situation in India (INR 100,000, approximately USD 2,146) (Kabra 2003); the median sums received by the lowest wealth class in Tanzania were up to 11 times lower than that offered in India.

Factors such as differential initial access to resources and varying agency of the people to be affected are usually

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**Table 7**

Summary of changes and impacts experienced by interviewees in different wealth classes

<table>
<thead>
<tr>
<th></th>
<th>Lowest</th>
<th>Middle</th>
<th>Highest</th>
</tr>
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<tbody>
<tr>
<td><strong>Access to land</strong></td>
<td>↓</td>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td><strong>Access to compensation</strong></td>
<td>+</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Post-compensation livelihood strategies</strong></td>
<td>Farming on remaining land, off-farm and non-farm wages</td>
<td>Farming on remaining land, off-farm wages, and agribusiness</td>
<td>Farming on remaining and newly acquired land, agribusiness, shops, and rental houses</td>
</tr>
<tr>
<td><strong>Explaining factors</strong></td>
<td>Harvesting of Corridor farms during time lag; compensation insufficient to purchase substitute land, used on consumption and other needs such as housing</td>
<td>Harvesting of Corridor farms during time lag; compensation used on immediate needs, consumption, and housing</td>
<td>Pre-existing plans realised with compensation; large compensation sums enabled significant investments</td>
</tr>
<tr>
<td><strong>Perceived outcome in well-being</strong></td>
<td>↓</td>
<td>↓</td>
<td>↑</td>
</tr>
</tbody>
</table>

Key: ↓ decrease, ↑ increase; + symbolises abundance
beyond the control of any intervention. But measures to avoid further contributions to social differentiation can and should be incorporated into the planning. Although successful examples of direct conservation payments have been reported in developed countries (cf. Wilkie et al. 2010), the same lessons do not necessarily help design effective and equitable conservation schemes in other contexts. The Derema case points to the need for supportive measures in addition to monetary compensation for displacement affecting poor but heterogeneous rural populations. Timely and long-term support to livelihood investments, including capacity-building, could have helped especially the ‘middle class’ farmers who used their compensation payments on consumption.

The temporal dimension appears crucial for the impacts of compensated displacement. In the Derema case, the time lag affected the social outcomes through decisions on asset restitution as well as inability to mobilise funds when needed. The real shock came and the coping strategies were put to test after harvesting from the Corridor farms finally ceased and compensation payments ended. This highlights the distinction between ex ante risk management strategies and ex post coping strategies for sustainable livelihoods (Ellis 2000). The former should be emphasised in planning compensation, or more broadly, livelihood rehabilitation support. Here, unpreparedness and changes in the implementing agencies led to the adoption of mainly ex post support, such as facilitation of savings and credit clubs and efforts to allocate land to the affected farmers, after many of them no longer had compensation money left for saving or for improving new land. Clearly, interventions involving restricting access to locally important production resources, with potentially far-reaching social consequences, are not to be attempted without adequate expertise and serious long-term commitment to the rehabilitation of the livelihoods of the affected people.

In addition to studying the socio-cultural characteristics of populations to be affected by reduced access to resources, the broader political economy context should be understood and addressed when designing and implementing livelihood rehabilitation support. Aside from the Derema farmers’ cultural identity as farmers, most of them had no other livelihood options than to continue farming in nearby locations, increasing demand for land and potential for leakage in the landscape. No industries are present in the area to absorb the population displaced from protected areas, and the tea estates’ demand for labour is largely saturated. In the lowlands, the farmers may face other competitors for land, unless the formalisation of their new land rights receives explicit political attention and backing. Conservation interventions still often disregard these wider cross-sectoral linkages, which may be crucial for efforts to successfully mitigate negative social and ecological consequences of displacement.

The real challenge for mitigating the negative social impacts of conservation is no longer the lack of evidence or absence of favourable policies. It still lies with getting the lessons learned from the pages of academic journals and policy documents and turning them into effective implementation by conservation and development actors worldwide.

ACKNOWLEDGEMENTS

We are indebted to the villagers of Makanya and Antakae for their patient collaboration and trust. The field assistance of Mr. Abduel Kajiru was crucial for this study; we also thank other field assistants. The World Agroforestry Centre and the Center for International Forestry Research provided financial support thanks to grants from the Ministry for Foreign Affairs of Finland and the Swiss Agency for Development and Cooperation. The World Agroforestry Centre offices in Nairobi and Dar es Salaam provided logistical and administrative support. The staff of Tanzania Forest Conservation Group, Amani Nature Reserve, Forestry and Beekeeping Division, and Muheza District supported our field research. Ric Coe, Terry Sunderland, Ramadhani Achidiawan, Juhani Koponen, and Laura German helped with the study design and provided useful comments on earlier drafts. We are also grateful for the comments of the three anonymous reviewers.

Notes

1. In this article, we use a definition of ‘displacement’ which includes restricted access to livelihood resources in addition to physical relocation of people and their settlements (Cernea 2005; Agrawal and Redford 2009).

2. Following Koponen’s (2004: 6) conceptualisation of development, ‘intervention’ means activities or measures that are initiated to trigger a process to achieve a certain objective or set of objectives, in this case conservation goals.

3. Rantala and Vihemäki (2011) analyse the political dimensions of the Derema process using the same conceptual approach.

4. Including cultural values, meanings, or beliefs associated with specific resources, resource uses, and places.

5. Whereas previous state land titling processes were mostly focused on granted rights of occupancy for business interests, the Tanzanian land law reforms of the late 1990s aimed at increasing the security of customary land rights of the vastly rural population. Little progress has been made to date, however, in the issuance of certificates of village land to the village councils who might then grant certificates of customary occupancy to villagers.

6. The key informants, representing both genders in equal numbers, were selected on the criteria that they represented the different parts of the village and knew all the households in their neighbourhoods. They first defined locally acknowledged indicators of wealth, which in both villages included: 1) the total area of land accessed for farming; 2) number of livestock (dairy cows) owned; and 3) the type of house (building materials, number of rooms). This was also the agreed order of importance of the different indicators. Next, the participants determined mutually excluding descriptions for the indicators in each wealth class. They then drew cards with the randomly sampled household names, discussed the situation of each household vis-à-vis the pre-defined indicators, and assigned it to a wealth group. All participants had to agree on the classification. The whole exercise was carried out with the facilitation of the lead author with a trained local research assistant. The discussion among the participants, some of whom were in the sample, proved that they aimed to be as unbiased as possible in the classification. However, since the exercise took place sometime after compensation had been received, the key informants were asked whether the compensation had ‘enriched’ some households, resulting in their placement in the highest class (which would
explain any correlation between e.g., amount of compensation received and wealth group. The key informants insisted that the classification was based on the objective criteria that they had agreed upon, and that the current situation of any given household was used as a basis for the classification. Yet, the current status could be due to both assets possessed prior to compensation and acquired after it; for example, many people used compensation money on cattle and housing. It was also later observed that other implicit views were likely to have affected the outcomes of the exercise; for example, known problems with alcohol abuse appeared to have lowered the wealth category of a household in spite of e.g., area of land accessed. Nevertheless, triangulation with qualitative data supported the presented results regarding the main patterns of changes and impacts experienced by the various wealth groups.

7. In comparison, changes in e.g., access to forest products only came up when specifically prompted and were also discounted by many interviewees.

8. Refers to the Shambaa custom of levirate marriage, that is, a widow along with the property is ‘inherited’, i.e. married by one of the deceased husband’s male relatives, usually a brother.

REFERENCES


Siegele, L., D. Roe, A. Giuliani, and N. Winer. 2009. Conservation and...


Received: September 2011; Accepted: February 2012