

Invisible Losses and the Logics of Resettlement Compensation

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Abstract: *The necessity of compensating people negatively affected by conservation and other development projects has been widely acknowledged. It is less widely acknowledged that because conventional compensation assessments focus on material resources and their economic equivalents, many important losses incurred by resettlers are invisible to project authorities. Through ethnographic observations and interviews, we documented losses identified by people facing resettlement from Mozambique's Limpopo National Park. We also examined resettlement planning documents to determine why decision makers' assessments of natural resource use and value neglect losses residents identified as critical. Identifying, preventing, and mitigating invisible losses in resettlement planning necessitates a better understanding of intangible benefits residents derive from resources, which are often as or more important than their readily apparent material properties. These benefits include but are not limited to decision-making authority linked to owning land versus having the use of fields; ancestral identity and social belonging linked to gravesites; the importance of tree roots that provide a powerful sense of security because they suppress hunger in periods of scarcity; and the importance of people's location within social networks and hierarchies as they determine the benefits versus risks that will be incurred through resettlement.*

Keywords: compensation, conservation-related resettlement, invisible loss, Limpopo National Park, social disarticulation, World Bank

Pérdidas Invisibles y la Lógica de la Compensación de Repoblación

Resumen: *La necesidad de compensar a las personas afectadas negativamente por la conservación y otros proyectos de desarrollo se ha reconocido ampliamente. Es menos reconocido que ya que las valoraciones de la compensación convencional se enfocan en recursos materiales y sus equivalentes económicos, muchas pérdidas importantes causadas por repobladores son invisibles para quienes toman las decisiones. Por medio de observaciones etnográficas y entrevistas, documentamos las pérdidas identificadas por personas encarando la repoblación en el Parque Nacional Limpopo en Mozambique. También examinamos los documentos de planeación de la repoblación para determinar por qué las valoraciones del uso y valor de los recursos naturales de quienes toman las decisiones descuidan pérdidas que los residentes identifican como críticas. La planeación de la repoblación necesitó de un mejor entendimiento de los beneficios intangibles que los residentes obtienen de los recursos, que generalmente son igual o más importantes que sus propiedades materiales inmediatamente aparentes. Estos beneficios incluyen, pero no están limitados a, la autoridad que toma decisiones relacionada con poseer tierras contra tener el uso de los campos, la identidad ancestral y la pertenencia social relacionada con sitios de entierros, la importancia de las raíces de los árboles que proporcionan una sensación fuerte de seguridad ya que disminuyen el hambre durante periodos de escasez, y la importancia de la ubicación de las personas dentro de las redes sociales y las jerarquías mientras determinan los beneficios contra los riesgos que pueden provocarse por medio de la repoblación.*

Palabras Clave: Banco Mundial, compensación, desarticulación social, Parque Nacional Limpopo, pérdida invisible, repoblación relacionada con la conservación

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Introduction

The vast majority of people evicted from African parks have not been compensated for losses and entitlements to land and other resources (e.g., Brockington & Igoe 2006; Cernea & Schmidt-Soltau 2006). This is not the case for the few who have resettled and the thousands more who currently await resettlement from Mozambique's Limpopo National Park (LNP). Following World Bank guidelines, resettlement managers are evaluating projected losses among targeted resettlers (those who have yet to resettle). Their goal is to estimate the cost of replacing with equivalents or better the resources and services currently available within the park to those being resettled. Conversely, our analysis of how decision makers identify and assess projected losses indicates the LNP may begin to mirror other cases where compensation fails to restore those losses that matter most to those affected.

Conservation science and practice often call for resettlement under the assumption that protecting nature involves both changing people's behaviors and physically separating rural people (often indigenous peoples or those with resource-dependent livelihoods) from the species, ecosystems, or landscapes conservation programs aim to protect. Resettlement projects are also justified as opportunities for socioeconomic development that provide those being moved with improved access to basic services, markets, and new opportunities for tourism. These assumptions reflect the clear need and desire to conserve biological diversity and reduce poverty, but they are rarely tested (exceptions include Andam et al. 2010; Canavire-Bacarreza & Hanauer 2013). Instead, the end (conservation) too often justifies the means (resettlement) without robust evidence for such assumptions. More prominently, widespread recognition that resettlement infringes on human rights persists: costs and benefits are unequally distributed, poverty increases, and livelihood security decreases (Brockington et al. 2006; Agrawal & Redford 2009).

Compensation failures persist (across the industrial and development sectors) due to poor planning, systemic under financing, and weak economic valuation methods (Cernea 1999, 2008). Of particular importance are conventionally practiced compensation assessments that limit thinking about loss to material resources and readily apparent economic values and their equivalents (Fernandes 2008; Seymour 2008; Turner et al. 2008; Gregory & Trousdale 2009). As a result, these assessments exclude or undervalue invisible losses. These losses include the extra material benefits people derive from material resources (e.g., knowledge transmitted when using resources) and the means and relations through which people gain benefits (e.g., status and reciprocity inferred in the transfer of resources). We identified and examined the nature of invisible losses, first, as

they are perceived and experienced by LNP residents targeted for resettlement and, second, as they are accounted for or neglected in resettlement planning documents.

Impoverishment Risks, Social Disarticulation, and Invisible Losses

The World Bank in part recognizes and sets the standards for what should be accounted and compensated for in resettlement contexts across the globe. The bank's logic for compensation includes a useful but minimal list of impoverishment risks and reconstruction (IRR) recommendations. The IRR model identifies and seeks to address 8 risks resulting from resettlement: landlessness, joblessness, homelessness, marginalization, food insecurity, increased morbidity and mortality, loss of access to common property assets, and social disarticulation (Cernea 1997). The model is also aimed at guiding principles for postsettlement reconstruction. It is based on broad strands of research and policy that address the conditions said to determine success and failure in resettlement contexts.

However, practitioners who assess loss for the purposes of providing compensation often narrowly operationalize risk prevention or mitigation. Typically, they address whether or not resettlers will receive access to material resources and services (i.e., land, housing, schools) in host communities according to the physical availability and abundance of those resources, services or their economic equivalents in the destination location. This approach fails to account for a host of invisible losses—losses that are significant, even devastating to local people but not recognized, not readily measured, not seen as important or legitimate, or seen as beyond the purview of project authorities (Turner et al. 2008).

The impoverishment risk that comes closest to exemplifying the concept of invisible losses we describe below is social disarticulation. Social disarticulation occurs when resettlement dismantles social networks, destabilizes authority systems, undermines identity (sometimes referred to as cultural well being), and disrupts reciprocity patterns (Bennett & McDowell 2012). Social disarticulation typically results in increased socioeconomic vulnerability, reduced capacity to cope with uncertainty, and stigmatization of conservation migrants in their host communities (Downing 1996; Cernea & McDowell 2000). In resettlement practice, it remains among the most neglected risks. To correct this trend, we conceptualized social disarticulation in a way that highlights the importance of recognizing that resettlement situates people inside social networks that enable and confer or, alternatively, prevent and hinder their ability to derive resource benefits (McDowell 2002; Bennett & McDowell 2012).

To understand how resettlers in the LNP experience social disarticulation, we highlight 3 components of invisible losses. First, invisible losses include social benefits that material objects come to represent. For example, the social status, reciprocity owed, or decision authority associated with a material good such as bush meat can be as or more important than the meat itself. Benefits that are vitally important to LNP residents but neglected in resettlement planning include identity, belonging, and status (Bennett & McDowell 2012).

Second, and also excluded from resettlement planning, are the social mechanisms—the formal and informal “means, processes, and relations”—through which actors gain and maintain benefits (Ribot & Peluso 2003: 160). For those who are transporting themselves and their village to a new social and geophysical environment, the capacity to use, make decisions about, and derive benefits and meaning from things hinges on the availability and abundance of resources and resettlers’ abilities to navigate social relationships. This means they must nest themselves strategically in a set of relations that has everything to do with their future ability to realize and recover social, physical, and extraphysical benefits that are linked to resources.

Third, benefits derived are often unequally distributed among a population, a situation that can be unintentionally exacerbated through compensation programs. To operationalize this point, we distinguished between access, defined as the ability to derive material and social benefits from resources, and control, defined as ability to make decisions concerning access by others (Ribot & Peluso 2003).

We next consider how the LNP compensation plan neglects these key losses in several ways. First, we consider the example of compensating residents for the loss of trees, wherein planners ignore geophysical, economic, and extraphysical losses. Second, we assess how compensation for loss of forest use overlooks the benefits of belonging and social continuity derived through forestry practices. Third, we examine how and why compensation for gravesites ignores the loss of ancestral authority affiliated with these sites, a crucial mechanism for achieving and communicating status in this region. Fourth, we consider planned compensation for agricultural fields. We demonstrate the hierarchies of benefits and risks associated with coming to belong to a new village in the resettlement site and the significant invisible losses likely involved. Thereafter, we consider how resettlement and compensation planning might be improved in the LNP and elsewhere. We also address the need to ensure that project authorities develop a better understanding of and deeper appreciation for the nature of what project-affected people are losing and consider the extent to which losses can be substituted by commensurate things or instead require different kinds of compensation and consideration.

LNP Resettlement

The LNP forms the Mozambican side of the Great Limpopo Transfrontier Park and constitutes 10,000 km² of arid land characterized predominantly by Limbombos Woodland and Shrubland and Mopane Woodland (Stallmans et al. 2004). Approximately 27,000 people of the Tsonga-Shangaan linguistic and ethnic group reside in the LNP, most along park boundaries. The 6500 residents who live in the interior of the park are targeted for resettlement.

The overall objectives for national and transfrontier conservation development include maintaining ecosystem processes; ensuring sustainable use, community participation, and benefit sharing; and promoting socioeconomic development primarily through responsible tourism (MITUR 2003: 26). There is also a strong commitment to restoring wildlife populations by encouraging cross-border wildlife movement and preventing poaching, namely of rhinoceros (*Diceros bicornis* and *Ceratotherium simum*), which has become a critical problem in recent years.

The state’s decision to undertake resettlement was made based on beliefs that community goals are incompatible with conservation goals, that resettled residents will have better opportunities for socioeconomic development outside the park, and that the park will attract more investors and tourists, and therefore be more economically sustainable, if the interior region is presented as unpeopled. More recently, mounting concern about human-wildlife conflict, especially poaching of rhinoceroses, has added momentum to resettlement as a key mechanism for achieving conservation goals.

Methods

To assess losses anticipated by residents targeted for resettlement, we conducted ethnographic observations, interviewed resettlers, and compared results of observation and interviews with the use, value, and resource relations characterized in central planning documents. Ethnographic and interview-based research took place in July 2003, intermittently from July 2006 to July 2007, and in October 2011 in the socially, historically, and politically linked villages in the interior of LNP: Makandezulu A and Makandezulu B. Makandezulu A and Makandezulu B have a combined population of approximately 425, and livelihood strategies consist of subsistence-based, rain-fed agriculture, animal husbandry, wild plant and tree use, and wage labor (predominantly migrant labor to South Africa and a few cases of employment with the park authority). The majority of village residents share the same dominant clan name (Maluleke) and both villages share the chief (who is distinct from internally recognized traditional leaders). Villagers at both sites anticipate resettling together to the village of Salane (Fig. 1).

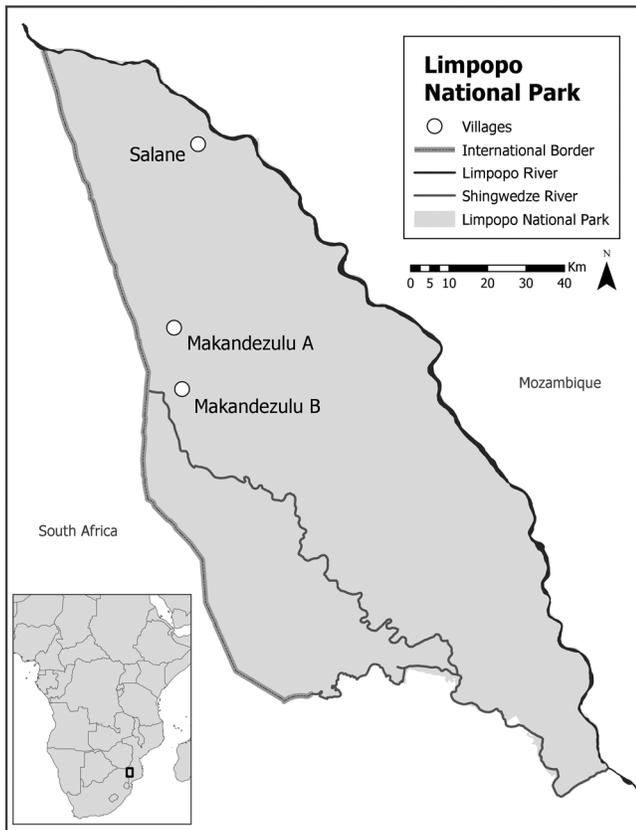


Figure 1. Case study villages in Limpopo National Park (map layers from Peace Parks Foundation, map prepared by S. Klain, 2013).

Twenty-five in-depth oral history interviews and 43 standardized interviews examined how residents access, use, and value environmental resources (i.e., trees, forests, land, agricultural fields) (2003–2011). We also studied data from a review of resettlement planning documents. We analyzed all data with NVivo (version 8), which organizes and codes data according to preexisting classifications (e.g., categories of loss established in the IRR model and resettlement policy documents) and emergent themes (e.g., those categories of loss emphasized by residents) (Ryan & Bernard 2003). We compared these results with the LNP's pilot Resettlement Action Plan (RAP), which is "an agreed plan and implementation budget" for "the provision of replacement fields, houses and other infrastructure; compensation, in cash or in kind, for other losses; and provision of other assistance and measures to enable the affected families to restore and improve their livelihood" (MITUR 2007: 1).

Results

The RAP adheres to IRR recommendations in that it contains plans for restored and renewed access to cement houses, agricultural fields, water, forests, trees, grazing

land, businesses, schools, and health care facilities in proposed resettlement sites. It also includes "measures to support the host population" and "to integrate" resettled and host communities (MITUR 2003: 1). Resettlement managers emphasized that these provisions are only one part of the overarching approach to resettlement as development. To that end, and among other provisions, in their destination locations, resettlers will have access to irrigation schemes, a community nursery, and a sustainable use program, and park residents have already begun to receive 20% of park revenues. These and other elements of resettlement planning indicate that project authorities seek to mitigate and to avoid those outcomes identified in the IRR model. In their efforts to assure material outcomes, however, they are failing to account for losses that residents identify themselves as critically important.

We identified these losses by asking resettlers, What does resettlement mean to you, what is at stake, and what will you miss the most if you resettle? In both interviews and less formal conversations the majority of respondents repeatedly mentioned and indicated through nonverbal cues their distress about "missing . . . [their] *makwakwa* trees" (*Strychnos madagascariensis*), "abandoning" their ancestors, and no longer being "owners of land." We explain below the meanings of these claims and their neglect in compensation practice.

Compensation for Trees and Material Gaps in the RAP

The RAP presents significant challenges to achieving decision makers' goal of providing resettlers with adequate compensation. This is even the case with respect to geophysical resources and economic values, which are widely recognized as key to preventing impoverishment. The example here of resident tree use is illustrative but not unique (e.g., Milgroom & Giller 2013). The RAP addresses loss of access to trees by permitting residents to transplant fruit trees from preresettlement fields and homesteads to their destination locations. Alternatively, resettlers will be provided replacement seedlings, planting materials, and cash compensation "at full replacement cost for their losses" (MITUR 2007: 37).

These approaches to tree compensation neglect several dimensions of residents' actual tree use. First and most importantly, the RAP considers only trees planted in homesteads, whereas the most valued trees for residents are wild trees located in the bush (i.e., forested lands outside villages). Second, human consumption is not the only way residents use trees. They also use trees in ceremony, healing, and construction, as grave and cultural sites, and for fuel, fodder, and shade. Third, this approach to compensation includes fruit consumption but excludes other consumptive uses (e.g., roots, bark, sap, medicinal leaves). Fourth, the RAP is biased toward trees that have a widely recognized market value like papaya

and mango and unlike *xikutsu* (*Boscia Albitrunca*) and makwakwa. However, papaya and mango trees have an extremely low survival rate in this region and failed to rank among the most salient trees for residents.

As a result, and among numerous other examples, the RAP fails to account for *xikutsu*, which residents reported as the most important tree in the region during periods of drought and political instability. The tree is key to human resilience because people eat the root to ward off hunger (e.g., when they have run out of food while traveling in the forests) and starvation (e.g., when hiding in the forest for weeks on end during sustained periods of war). Nonetheless, loss of access to this and many other trees is not addressed in the RAP. Because residents consume the root of the tree rather than its fruit and because they access the tree in the bush, instead of planting it in their homesteads, compensation neglects both its subsistence and cultural value.

Compensation for Forests Versus “Missing Our Makwakwa Trees”

Residents will be compensated for the loss of access to forests, that is “provided with access to forest resources” in resettlement destinations. The aim is “to decrease pressure on [forests] . . . [by using] tree seedlings to establish a one hectare community woodlot near to the resettlement village” (MITUR 2007: 42). Yet, the presumption that access to woodlots can substitute, at least in part, for access to forests fails to acknowledge the social benefits residents derive from forests and the mechanisms through which they derive these. We illustrate these invisible losses through an analysis of what it means for residents to miss their makwakwa trees.

The makwakwa tree produces a round fruit with a hard outer shell and slick, bright orange pulp that is poisonous unless cooked. Through an extensive multiday process of collecting, shelling, transporting, roasting, grinding, and storing makwakwa, women produce one of the most salient wild foods in the region. Older Makandezulu residents in particular (both male and female) emphasized the importance of the food source as one that “saved us” in times of drought and war, and foresters were proud to have produced it “since the grandparents time and before.” While gathering and producing makwakwa, residents emphasized being part of a long history of women who continue to pass down forestry norms and practices from their ancestors. In so doing, they amplified the importance of understanding resources as nested in social relations that enable the use of that resource in the first place.

Resource relations in this region are characterized by patrilineal resource control organized around various lines of the Maluleke surname. Thus, it is notable that the most prolific foresters in the region are women, most of whom were not born in Makandezulu and do not

share the Maluleke name. Most married and moved into Makandezulu from places where makwakwa production, if it is practiced at all, is not as central to livelihoods and social networks. Upon moving to the villages, women begin to learn about the extensive process from other women, who were themselves taught by non-Maluleke women of preceding generations. Through these knowledge-sharing networks, they come to belong to and identify with and gain status in their new village.

A demonstrated ability to gain membership in a new group bodes well for resettlers, and indicates the potential for social rearticulation and the creation of new social networks in resettlement sites. Conversely, the lament, “missing our makwakwa trees,” indicates that residents anticipate and are concerned about social disarticulation.

Compensation for Gravesites Versus “Abandoning the Ancestors”

Compensation for gravesites is a crucial dimension of resettlement planning. Resettlers will be compensated for the loss of graves and other sacred sites on a case-by-case basis depending on the costs associated with either relocating graves to Salane or abandoning graves in Makandezulu and conducting associated ceremonies (MITUR 2007: 28). This choice reflects a narrow appreciation of what it means for residents to abandon their dead. In Makandezulu, graves are quintessential symbols of the ancestors, and they are key to ceremony, which comprises an equally crucial mechanism for connecting with the dead. Being displaced from ancestral gravesites and ceremonies involves vitally important losses of status, identity, belonging, and authority over resources (i.e., “ownership of land” as residents define it). They anticipate this loss of ownership given the spatially defined division of ancestral authority between villages.

The descendants of 3 distinct branches of the Maluleke clan were resource authorities in Makandezulu A, Makandezulu B, and Salane. Such leaders and chiefs have privileged access to their line of ancestors who confer on them the status, rights, and responsibilities to make decisions on behalf of their village. In each village, residents hold ceremonies at ancestral gravesites in honor of their ancestors. At these sites, male lineage authorities often express and reconfirm their authority over other members of the village with reference to the ancestors. For example, in 2007 a traditional leader of Makandezulu B began a village-wide first fruit celebration by imploring more than 20 members of the associated ancestral line to join the ceremony, saying, “We invite you here to drink with us.” The leader then appealed to these ancestors to protect the village from a wide range of risks. He exclaimed to the ancestors, “Where we go, there are elephants, what is happening? [. . .] The animals don’t eat in the forest; they are eating here at our homes . . . The water holes are empty . . . We are crying because we do

not have water. Who will remember you if we die? What is happening here? Our people are dying without being sick?" Between pleas, the leader continued to evoke his ancestral authority to advise villagers not to wash clothing in the community water supply, to offer suggestions for how to keep problem elephants out of the hand-dug wells and children away from the elephants, to scorn some residents for allowing their cattle to enter others' fields, and to question unnamed individuals' unorthodox uses of witchcraft.

The leader's performance revealed that ancestral ceremonies are a key means through which important social and political economic challenges are addressed. He also discursively illustrated the other-than-material benefits associated with having "ownership of land." Though they do not always employ it, "owners of land" have the authority to shape, influence, and make decisions about other's access to resources. It is this sense of authority, symbolized by access to ancestral gravesites and control over ancestral ceremonies, that respondents, both leaders and constituents, anticipate losing in the destination location. Thus, whether or not resettlers choose to relocate or to leave the remains of the dead behind, resettling means losing ancestrally derived status.

In light of the enduring ancestral division of authority between villages, conservation-related resettlement can also be seen as an exercise in lineage consolidation whereby 3 distinct Maluleke lines will come together in one village. Historically, and in contexts of planned resettlements associated with war, drought, and state-induced villagization programs, residents and their ancestors successfully avoided moving together precisely because of the anticipated losses we describe. Moving and coming to belong to a new group means submitting to the authority of other ancestors and ancestrally derived leaders, a risk both leaders and their constituents abhor.

Compensation for Fields Versus Losing "ownership of land"

According to the RAP, resettled families "will be provided with a replacement field . . . [that will] equal or slightly exceed the total area of the land abandoned" (MITUR 2007: 37). As productive agricultural units with individual- and household-level tenure systems, agricultural fields more than any other land use type, resemble conventional western understandings of tenure as a person or family's defined plot of land. In the RAP, fields are assumed to be commensurate entities whereby economic and material valuation prevails. Thus the RAP neglects the important difference between owning fields and owning land. Also, the plan emphasizes resource availability and does not account for the mechanisms through which resettlers gain the benefits of access and control.

To illustrate these points, we draw from residents' comparative explanations of how newcomers to Makandezulu establish (or fail to establish) ownership

of fields and land. Most interviewees, 82%, described a principle of equity through which all members of a village gain fields, regardless of their heritage or when they moved into the village. Access, first, is gained simply by ploughing fields. Others spoke in terms of openness and inclusivity; one woman stressed that as a newcomer to the village "You are received!" Immediately following this initial emphasis on ease, hard work, and inclusivity, most residents drew a clear distinction between what it means to have access and even decision-making authority over fields versus what it means to have "ownership of land." "Being natural" to a place and a people is key to ownership: "Getting land to use the soil, you can do, but to be the owner, you have to be natural" or born into the dominant or owning lineage of that village. Another resident asserted, "It is very easy (to get fields here) because when you arrive here, you go straight to the land where you want to stay and after that, you open the field. Being accepted to stay there (however) doesn't mean you have a voice. Those who are natural here have the voice." Similarly, a third interviewee explained, "If they [the owners here] show you a place, it is yours for a field but the land is not yours . . . Everything that you cultivate is yours but the land is *not* yours." These responses demonstrate the tensions between the principles of equity regarding use of land versus hierarchy regarding ownership. Disrupting lineage hierarchies is closely linked to the loss of decision authority among other privileges that are considered deeply meaningful.

Discussion

Resettlement for the vast majority of LNP residents is still pending, despite a decade of resistance, compliance, and waiting. Improving the conditions under which the resettlement moves forward, including advancing a just compensation program, hinges on several factors, some of which are beyond the scope of the RAP. However these same factors are critical for understanding the scope and magnitude of what is being lost and for identifying, preventing, and mitigating invisible losses as and before they occur. On the basis of our findings there are 3 concerns that merit further attention.

First, there is a need to ensure that conservation and project authorities develop a better understanding of and deeper appreciation for the nature of what project-affected people are losing and the mechanisms through which current benefits are maintained. This entails prioritizing local characterizations of benefits lost or gained over "legal precedents or economics" (Turner et al. 2008). It also entails devoting more attention to integrating and operationalizing resettlement compensation approaches with extant scholarship.

Our results provide needed empirical evidence on social disarticulation resulting from conservation-related

resettlement. They also bring concrete evidence to the truism that each and every impoverishment risk includes invisible or extramaterial losses that are commonly unrecognized, undervalued, or neglected outright by project authorities.

Building on extant scholarship, we demonstrated that mitigating risks, including the ability to derive social benefit from material resources, depends not only on the availability and abundance of resources, but also on social relations (Ribot & Peluso 2003; Bennett & McDowell 2012). As in other rural African localities, coming to belong to a new group means “placing [oneself] under the protection and authority of its leaders” (Berry 1989: 41–42) and submitting to the authority of other ancestors, and so other ancestral leaders. While doing so entitles newcomers to resources, resettlers will not have or transport with them heretofore decision-making authority (Shipton & Goheen 1992). Furthermore, when integrating into a new group, new members also extend and legitimize the authority of the group they are entering, whereas the authority of the ancestors left behind is severely diminished. The left behind branches of Maluleke authority ultimately face their demise.

Compensation can create and exacerbate unequal relations not only within households (e.g., Rantala et al. 2013), but also among villages. Although many scholars recognize the social dimensions of access relations, most still tend to characterize benefits derived from resources in material terms (e.g., Ribot & Peluso 2003). We instead found that the most significant losses anticipated by resettlers were not, or at least not only, material ones (see also Bennett & McDowell 2012). Thus, achieving a robust “economics of recovery” (e.g., Cernea 1999, 2008) necessitates improved understandings of the nature and value of nonmaterial losses, a gap that is acknowledged, but not yet adequately addressed in scholarship on improving economic valuations of displacement losses.

In future resettlement compensation planning, we believe outcomes will be greatly improved through integrating scholarly advancements across the socioecological sciences. Among other examples, there is a growing body of work that seeks to inform resettlement policies with theories and applications of rights (e.g., Pearce & Swanson 2008; Clarke 2009; Maldonado 2012; Rantala et al. 2013). In addition, scholars working on cultural ecosystem services have developed conceptual and methodological approaches to measuring and making intangibles more transparent in environmental management contexts (e.g., Chan et al. 2012; Satterfield et al. 2013).

Second, our assessment of resettlement planning raises important questions about the ability of project authorities in the LNP to achieve their goal of providing full compensation for losses in both material and extramaterial terms. Most importantly, materialist–literalist compensation for trees, forests, graves, and fields is incommensurate to and thus does not adequately substitute

or compensate for loss of status, identity, belonging, resilience, and ancestral authority. We found that the problem of compensating for losses was akin to the problem of nonsubstitutability, well recognized by ecologists and conservation biologists. In the 1980s and 1990s, an important disciplinary divide emerged between economists and biologists. Whereas economists emphasized the substitutability of things, biologists and ecologists recognized the fallacy of this logic with respect to the irreplaceability of some species and ecosystem services (Ehrlich & Mooney 1983; Ayers 2007). The trouble emerged, in part, because the substitution was ill matched to the magnitude of the impact sustained by the loss (Ehrlich & Mooney 1983; Keyfitz 1995).

We are not equating social benefits lost by humans in contexts of resettlement with species loss. Rather, we draw this comparison to emphasize that there are also “limits to substitution” (Ayers 2007) in social systems; that is, the nature of some losses are incommensurate to and not readily replaced by things of apparent equivalence or increased economic value. Losing these social-thought-immaterial goods has real consequences for the viability of life in new places (see also Pearce & Swanson 2008). Increasingly, scientists and managers contend that some losses are unavoidable (Hagerman & Satterfield 2013). If this is also the case with respect to conservation-related resettlement, it is all the more critical that affected groups, project authorities, and the public come to better understandings of the nature of the trade-offs at hand (Hirsch et al. 2010).

Third, the state must be held accountable and provide additional compensation for the conditions under which resettlement has developed and is taking place, a principle economists refer to as “equity weighting” (Pearce & Swanson 2008). A full history of the resettlement program is beyond the scope of this analysis, but it is crucial to understand that over the past 10 years, it progressed slowly, effectively stalled, and of late is experiencing increased momentum. In that time, residents awaiting resettlement have already incurred and continue to incur significant losses, a situation which has already exacerbated their impoverishment and significantly undermines the government’s claim that the resettlement program is voluntary (Witter 2013). Such losses include food and economic insecurity due to increased conflict with elephants and lions, diminished access to basic services (water, health care, and schools), criminalization of livelihood strategies (e.g., hunting, planting, gathering, and traveling through the park), and mounting security threats linked to rhinoceros poaching. These losses are, of course, more than material because what it means to live in this region has drastically changed even though resettlement has yet to take place. The need, not only for reconstruction, but also for reconciliation is paramount. In particular, the government’s responsibility to local residents and the mechanisms through which residents

can hold the government accountable need to be made much more transparent. Concurrently, compensation, resettlement, and conservation policies need to be adjusted to reflect the scope of losses that continue to be incurred.

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