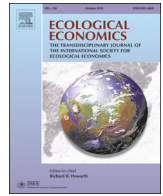




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## Analysis

# Looking for Medium-term Conservation and Development Impacts of Community Management Agreements in Uganda's Rwenzori Mountains National Park



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## ABSTRACT

We evaluate the impact of collaborative management agreements (CMAs) designed to protect forests and raise incomes for smallholders living adjacent to Rwenzori Mountains National Park (RMNP), Uganda. We use a quasi-experimental study design to estimate changes in several income measures, as well as land cover using three waves (2003, 2007, and 2012) of household survey and remote sensing data. Overall, we find no significant impact of CMAs on any of our income measures. However, when disaggregating households by income quartile, we find that access to forest resources in RMNP may have had an income stabilizing effect for poor households. Forest income grew significantly faster among the poorest quartile of treatment relative to control households, partially because poor households recorded very low income from forests at baseline. The effect of CMAs on forest cover is minimal, although we find that conversion of woody savanna and savanna to cropland is more pronounced in villages with CMAs. These findings suggest that in the medium-term, CMAs have failed to deliver conservation or development benefits related to enhancing livelihoods or conserving forests near RMNP. Practitioners should consider different CMA models or other strategies for improving welfare and forest health outcomes in communities neighboring protected areas.

## 1. Introduction

Collaborative management agreements (CMAs) are widely promoted as an opportunity for rural households to benefit from their proximity to protected areas and contribute to conservation goals (Carter and Gronow, 2005; Schreckenberg and Luttrell, 2009; Bowler et al., 2012). Despite widespread implementation of decentralized approaches to protected area management, few researchers have approached the question of whether CMAs deliver their intended conservation and development outcomes using impact evaluation study designs and methods (Ferraro and Pattanayak, 2006; Jagger et al., 2010; Ferraro and Hanauer, 2014). The focus of this paper is the impact of CMAs negotiated between local communities and the Uganda Wildlife Authority (UWA) which establish formal benefit sharing arrangements in communities adjacent to Rwenzori Mountains National Park (RMNP), Uganda. CMAs in RMNP were among the first successfully

negotiated in the wake of a major forest sector decentralization reform that took place in Uganda in 2003 (Jagger, 2010). Our study examines the medium-term impacts of a conservation and development institution that has been widely taken up in Uganda and neighboring countries over the past two decades.

CMAs have the potential to improve forest conditions by reducing illegal harvesting (Persha and Blomley, 2009) or fostering greater awareness and investment in natural resource management (Andersson et al., 2006). Longitudinal studies of devolution initiatives in sub-Saharan Africa show mixed results with both gains and losses in forest cover (Blomley et al., 2008; Treue et al., 2014; Mazunda and Shively, 2015; Rasolofoson et al., 2015). Studies examining the impacts of collaborative forest management on forest user incomes in Africa also have mixed results (Ameha et al., 2014; Gelo and Koch, 2014; Mazunda and Shively, 2015). A common theme in many studies is that the distribution of benefits in devolution schemes is often uneven (Vyamana, 2009;

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Jagger, 2010; Persha and Andersson, 2014), which may exacerbate inequality within communities (Schreckenberg and Luttrell, 2009). Powerful actors capture the majority of benefits associated with reforms (Ribot et al., 2010), although involvement of organizations from outside the community can help ensure more evenly distributed benefits (Persha and Andersson, 2014).

While there is much optimism about the benefits of CMAs (Carter and Gronow, 2005), there is a dearth of empirical evidence to confirm whether and under what conditions devolution results in favorable outcomes (Meinzen-Dick et al., 2004). Much of the literature on outcomes of natural resource devolution draws on case study designs with low internal and external validity making it hard to draw widely applicable policy lessons (Bowler et al., 2012). Impact evaluation techniques enable researchers to generate high levels of inference about the effectiveness of conservation policies. Yet scholars of conservation and development policy in developing countries have been slow to adopt such approaches, in part due to obstacles related to logistics, measurement, cost, and lack of suitable incentives (Ferraro and Pattanayak, 2006; Baylis et al., 2015; Sills et al., 2017). Despite these challenges, several recent studies examine the impact of protected area establishment on poverty (Andam et al., 2010; Canavire-Bacarreza and Hanauer, 2013; Clements et al., 2014), forest cover (Andam et al., 2008; Miranda et al., 2016), and both (Sims, 2010; Naughton-Treves et al., 2011). A comparable evidence base does not yet exist for CMAs and other natural resource devolution policies (Bowler et al., 2012).

### 1.1. Collaborative Management Agreements in RMNP

The CMAs we analyze were established in two villages located outside, but immediately adjacent to RMNP. The agreements were negotiated between a Community Protection Area Institution (CPI) and UWA. CPIs exist in most villages near the park, are designed to connect community members and UWA officials, and are comprised of the Secretaries for Production and Environment from each sub-county bordering the protected area (UWA 2004). CMAs articulate use rights that allow households to harvest products from RMNP for subsistence use including bamboo, medicinal plants, honey, fuelwood, and vines (vines from RMNP are used to make a basket commonly used for transporting heavy goods through the region). In the absence of a formal CMA, harvesting forest products for subsistence use is illegal. Harvesting products for sale or commercial purposes remains prohibited under the CMA.

In exchange for access to subsistence goods, local resource users agree to monitoring activities within RMNP, and are required to report illegal harvesting activity to UWA officials. If UWA staff find evidence of illegal activity, community members risk losing harvesting privileges and could ultimately have their agreement revoked. Individuals in villages without formalized CMAs are subject to existing RMNP restrictions regarding resource harvesting within the park.

The CMA negotiation process was collaborative in nature and included participation from a large segment of the community, including members of disadvantaged groups. Benefit sharing agreements of this nature have the potential to benefit all members of the community, though UWA emphasizes that the poorest and most vulnerable households should have priority access to benefits within the Park. Further, poorer households generally do not own their own forest plots, so they are likely to be more dependent on accessing products from within the Park, making CMAs an attractive policy for improving outcomes for the poor. There are currently fewer than five of these agreements in existence in RMNP. Agreements typically take several years to negotiate and often go through several iterations before terms are agreed upon due to protracted negotiations about use rights, bureaucracy surrounding the execution of the formal agreement, and limited capacity of UWA officials and members of CPIs to invest time in developing CMAs.

RMNP experiences high levels of illegal forest product harvesting

and encroachment, which has adversely affected forest conditions. We hypothesize that participation in CMAs focused on benefit sharing will lead to increased incomes from forest products and improved forest health through three mechanisms. First, because negotiating the CMA required extensive community consultation, we believe that this process may have increased local awareness regarding acceptable sustainable resource collection practices. Earlier research in western Uganda has documented the lack of awareness among forest users concerning what harvesting rules exist (Jagger, 2014). Greater clarity among forest users concerning harvesting rules may result in a reduction of illegal harvesting or agricultural encroachment in RMNP. Second, the CMA provides improved access to forest resources, particularly for poorer households. All else equal, gains in access to forest resources should raise total incomes and may reduce pressure on forest resources outside RMNP. Third, as the CMA can be withdrawn if evidence of illegal harvesting is found, this provides an incentive for forest users to contribute to monitoring efforts and report violators to UWA staff, potentially resulting in improved forest resource conditions.

## 2. Methods

### 2.1. Study Area and Treatment

RMNP is in the northernmost region of the Albertine Rift in the area stretching between Lake Albert and Lake Edward (Fig. 1), one of the most diverse ecosystems in Africa with > 7500 species of animals and plants, including many endemics (Plumptre et al., 2007). UWA has had management responsibilities for RMNP since 1991. The majority of households living adjacent to RMNP live between 1500 and 2200 m above sea level in grassland and montane forest vegetation zones (UWA, 2004). Livelihood strategies fall into five main categories: agriculture, livestock husbandry, collection of forest and wild products, wage labor, and self-employment (i.e., small business). Arable land holdings in the area are small (< 3 ha). Dominant cropping systems include maize, bananas, and coffee; households keep small ruminants and poultry in extensively managed crop-pasture systems. Marketed forest products include timber, charcoal, bush meat, *Prunus Africana*, poles, bamboo, baskets, and furniture. Other forest products (e.g., fuelwood, wild vegetables and fruits, mushrooms, medicinal plants) are used for household subsistence. The labor force is relatively stationary, suggesting few opportunities for households to generate remittances (Jagger, 2012). Deforestation is well known to be a major environmental problem in western Uganda (Sassen et al., 2013; Jagger and Shively, 2014; Bailis et al., 2015). Small-scale agriculture and timber harvesting are the main drivers of land use change in our study area (Mwavu and Witkowski, 2008; Jagger, 2012).

The treatment group in our analysis is two villages with CMAs, Village A and Village B. The CMA was established in Village A in 2005 after more than a decade of negotiations between the village CPIs and UWA. Village A was identified as a strong candidate for piloting a CMA due to a long history of engagement with NGOs and proximity to an UWA outpost making both communication with the village leaders and monitoring of fulfillment of the CMA agreement easier. Village B signed a CMA agreement in 2008 and characterized similarly with an UWA outpost nearby and extensive contact with NGOs and ecotourism organization. Village B is the starting point of a trekking route into the Rwenzoris. Agreements in both villages involved articulation of access rights for the subsistence harvesting of fuelwood, vines, wild fruits and vegetables, honey, medicinal plants and limited quantities of bamboo. In exchange, villages were expected to assist in the maintenance of the park boundary and monitor activities occurring along shared boundary between the village and the park, and for 3 kms into the park.

### 2.2. Data and Sampling

We analyze two datasets to explore the impact of CMAs on

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