



Research article

Protected area co-management and perceived livelihood impacts

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ABSTRACT

Creation of protected areas to conserve biodiversity can have both positive and negative impacts, with impacts unequally distributed within local communities. A global shift towards local community involvement in protected area governance and co-management has aimed to reduce costs of protected area establishment and their uneven distribution. Yet, there is mixed evidence to support whether such initiatives are succeeding. Here, a protected area in Madagascar is used as a case study to explore how co-management governance processes impact upon livelihood strategies and outcomes, and how these impacts are distributed within and between villages.

Focus groups, interviews and questionnaires were conducted in 2015/16 with households surrounding a protected area, co-managed by local community associations and a national NGO. Data analysis was framed around the Sustainable Livelihoods Framework.

The majority of respondents perceived negative livelihood outcomes, and impacts were unevenly distributed between social groups. Respondents were more likely to report negative livelihood outcomes if they were from remote villages, poorer households and reliant on provisioning ecosystem services before protected area establishment. Qualitative data showed that the main drivers of this were protected area-related rules and regulations restricting forest activities. Drivers of improved livelihood outcomes were training and materials improving agricultural yields and increased community cohesion. Although co-managed protected areas may be overall more effective in meeting biological and socio-economic goals than protected areas of other governance types, the evidence here suggests that governance processes can lead to local perceptions of inequity.

1. Introduction

Protected areas (PAs) are one of the most frequently used conservation strategies, but remain contentious due to their negative impacts on local communities (Holmes and Brockington, 2012; Pullin et al., 2013) and mixed evidence on their ability to conserve species and habitats (Eklund and Cabeza, 2017; Geldmann et al., 2013). A global shift towards co-management and community involvement in PA governance and management, has in part, aimed to reduce local costs of PAs and provide more equitable management (Berkes, 2009). Yet there is mixed evidence as to whether this new form of governance is meeting its aims. In this study, we explore how co-management governance processes impact upon local livelihoods and how these impacts are distributed within and between local communities.

There is no universally agreed definition of co-management, but generally it refers to shared authority and decision making between parties, often local communities and the government or NGOs (Berkes, 2010). IUCN categorises these PAs as shared governance, and defines this as where a governmental agency and other stakeholders, such as

local/indigenous communities that depend on the area culturally or for their livelihoods share power and responsibility to make and enforce decisions (Borrini-Feyerabend et al., 2012). It is clear that this may encompass both governance and management, and although these terms are often used interchangeably in the literature it is important to distinguish between them. Governance refers to who holds the power, authority and responsibilities, whereas management refers to resources, plans and actions (Lockwood, 2010; Lyver et al., 2014; Borrini-Feyerabend et al., 2012).

Signatories to the Convention on Biological Diversity (CBD) and Aichi Targets have agreed to not only increase PA coverage by 2020, but also to ensure that PAs are managed equitably (CBD and UNEP, 2010). Equity broadly refers to “the fair or just treatment of individuals or groups” (Law et al., 2017: 4). Co-managed PAs may offer a more equitable method of establishing and running PAs, as they provide opportunities to reduce local costs or provide benefits via the potential to tailor rules to local conditions, increase regulatory compliance, improve collaboration, and lead to greater stakeholder engagement and empowerment (Ayers et al., 2017; Carlsson and Berkes, 2005; Berkes,

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2009). Challenges of implementing co-management include institutional barriers, engaging all relevant stakeholders, conflict throughout planning processes and equity issues relating to collective decisions or unequal distribution of benefits (Kocho-Schellenberg and Berkes, 2015; Manzoor Rashid et al., 2013; Trimble Nunez et al., 2013). Successful co-management arrangements often require time to develop institutional networks and trust between them (Berkes, 2017). Existing research shows that co-managed PAs are more likely to provide socio-economic benefits than other governance-types, but this varies (Oldekop et al., 2016). Positive outcomes are more likely for PAs allowing sustainable-use, empowering local people, reducing inequalities and providing cultural and livelihood benefits (De Vente et al., 2016; Oldekop et al., 2016). But also, co-management may be more efficient in areas where there is resource control (for example forestry or fisheries) where it can improve data quality, reducing overcapitalisation, promoting economic development, ensuring more equitable allocation decisions, sharing power and reducing conflict (Ayers et al., 2017; Gurney et al., 2016).

A key part of many PA co-management approaches is the participation of local communities in PA governance or management. Participation can range from a brief consultation before PA establishment to full participation in daily management decision-making (Sterling et al., 2017; Reed, 2008; De Vente et al., 2016), yet this is all grouped under community participation. Involving local communities in conservation interventions, particularly PAs, has been well documented in the academic literature. Advantages are similar to those given to co-management and include: greater evidence base and diversity of views to improve decision making; increased trust between stakeholders; and increased support for interventions. Disadvantages include: risk of elite capture and dominance; potential for conflict between stakeholder groups; and increased time needed for decision-making (Ward et al., 2017; Sterling et al., 2017; De Vente et al., 2016; Reed, 2008). However, a recent review of the literature concluded that there are still many aspects of participation which are poorly understood and studies could be improved by incorporating qualitative data (Sterling et al., 2017).

Existing studies have analysed how the benefits and costs of PA establishment are distributed (e.g. Foerster et al., 2011; Franks et al., 2014; Gurney et al., 2015), but few have explicitly linked this to the governance processes causing these impacts. As community involvement in PA governance becomes more widespread, we need to understand whether and how it is meeting the aim of improving PA-related equity within particular country settings. To explore this, in this paper we focus on Madagascar, which has seen a strong shift towards co-management of PAs, presenting a useful case study to explore how co-management governance processes play out in reality.

In 2003, President Marc Ravalomanana of Madagascar announced the 'Durban Vision', which aimed to establish a new network of PAs across Madagascar (Virah-Sawmy et al., 2014). These PAs differ from the existing state-run network of strictly protected National Parks in two main ways. Firstly, the new PAs would be co-managed by a 'promotor' (usually an NGO) and local community associations (locally known as VOIs); and secondly, the new PAs would contain sustainable resource-use areas alongside more strictly managed no-take zones (Gardner et al., 2013). The VOIs act as a mechanism for local community members to have a say in PA governance and management, from establishment through to daily management decisions. The creation of this new PA network followed both instrumental (increased PA coverage without stretching the limited Malagasy government resources) and moral (involving local communities to reduce PA-related costs and potentially even provide benefits) drivers. Studies of this new PA governance have so far found mixed results in terms of meeting these aims (Ward et al., 2017; Corson, 2012, 2014; Virah-Sawmy et al., 2014).

This study is conceptually designed around the Sustainable Livelihoods Framework (Fig. 1) to explore PA-related benefits and costs, and how they interact with co-management governance

processes. The Sustainable Livelihoods Framework has had wide application in development disciplines, and some use within conservation (Bennett, 2010). Weaknesses of the framework include limited consideration of political aspects and wider contexts, and a top-down approach to identifying livelihood assets (de Haan and Zoomers, 2005). We argue that it provides a useful framework as it takes a holistic view of livelihoods, incorporates governance processes and is easy to look at different social groups, making it ideal for investigating the links between PA co-management and perceived livelihood impacts. By enabling local households to define important livelihood assets we ensure that the methodology is not dominated by a top down approach. The Sustainable Livelihoods Framework defines a livelihood as the "means, activities, capabilities, assets and entitlements by which people build a living", and can be applied to explore how a certain event or 'shock' can lead to different livelihood outcomes (DFID, 1999). In this case, we define PA establishment as a 'shock', due to a potential change in access to natural resources and change of rules prohibiting certain livelihood activities (Ward et al., 2018). The framework has previously been applied to investigate impacts of forestry co-management (Chinangwa et al., 2016), marine PAs (Bennett and Dearden, 2014) and was used to design the Social Assessment of Protected Areas framework (Schreckenberg et al., 2010). The present study differs from these, by explicitly exploring the links between governance processes, changes in livelihoods and the distribution of these. The framework also allows investigation of different aspects of livelihoods or human well-being, which have not been frequently covered in the conservation literature, such as social and human aspects.

2. Methodology

2.1. Study site

The case study PA, Mangabe Forest, is located in Eastern Madagascar, and forms part of the Eastern tropical forest belt. This area is of high conservation priority due to significant levels of biodiversity and increasing human pressures from mining, shifting agriculture, locally known as 'tavy' and illegal rosewood trade (Poudyal et al., 2016). Madagascar is also ethnically diverse, including 18 groups with shared ancestry, institutional arrangements, livelihood activities, taboos or 'fadys', and generally tied to specific geographical areas (Scales, 2014; Randrianja and Ellis, 2009). The local population in Mangabe are of Bezanozano ethnicity. The Bezanozano have strong cultural links to the forest including creating tombs inside sacred areas, and considering hunting or eating Indri (*Indri indri*) fady, as they believe them to represent their ancestors. The majority of the population are subsistence farmers, relying on shifting agriculture and collecting forest products for subsistence use and trade (pers. comm. NGO staff).

Mangabe PA was established in 2008 to protect globally important populations of the critically endangered indri lemur (*Indri indri*), and the critically endangered golden mantella frog (*Mantella aurantiaca*). The PA consists of a core zone, which is strictly protected, and sustainable use areas. Local communities are allowed to access and use natural resources from sustainable use areas, but only for subsistence use. Common activities include firewood collection, collecting medicinal plants, collecting honey and hunting game species. Certain livelihood activities are restricted throughout the PA including goldmining, hunting lemur species, collecting animals to sell and commercial logging. Mangabe PA forms part of the 'Durban Vision' network of PAs, and is co-managed by a national NGO and 10 local community associations (VOIs). VOIs may be based on existing institutions or created by the co-management partner, and consist of a committee and members. All local community members over the age of 18 are eligible to join the VOI, and the committee is voted in by members. VOI members have regular meetings to discuss aspects of PA management and governance. NGO staff are not always present at these meetings, in which case a report of the meeting is sent by the VOI president or other

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