

LETTER

Assessing Equity in Protected Area Governance: Approaches to Promote Just and Effective Conservation

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Abstract

With the inclusion of equity concerns in Aichi Target 11 of the Convention on Biological Diversity, equitable management has become an important objective for the world's protected areas. The way equity is defined and operationalized influences whether this strategic shift can help identify pathways commensurate with conservation effectiveness. We examined equity around a protected area in Laos, combining quantitative and qualitative methods to explore the three dimensions of procedure, recognition, and distribution. Local understandings of equity depended on discrete, evolving issues, with attention to informal decision making and dynamic values required to uncover suitable solutions. We show that equity definitions focused on material distribution and assessments reliant on standardized indicators may result in inadequate responses that sustain local perceptions of inequitable management and miss opportunities for effective conservation. Equity should be considered a management goal to continually adapt toward, informed by stakeholder dialogue.

Introduction

Equity has emerged as an important goal of protected area (PA) management (McDermott *et al.* 2012), exemplified by Aichi Target 11 of the Convention on Biological Diversity which aims, by 2020, for "effectively and equitably managed" PAs. Equity is considered important for ethical reasons, because conservation can cause negative impacts to local populations, but also for instrumental reasons, because attention to the outcomes experienced by local populations may be a condition for conservation effectiveness (Hutton *et al.* 2005). Effectiveness, the impact of management on biodiversity outcomes (Coad *et al.* 2015), might be achievable without attention to social justice issues, especially if sufficient resources can be directed toward rule enforcement (Holmes 2013). However, many PAs operate in contexts characterized by diverse stakeholders and limited budgets. People are less

likely to cooperate where they perceive a lack of fairness (Fehr & Schmidt 1999) and perceived inequity may result in attempts to resist or undermine PA rules (Hirsch *et al.* 2011). Perceptions of unfairness therefore lead to higher PA management costs (Pascual *et al.* 2014), sometimes through active resentment, such as vengeance killing of charismatic fauna (e.g., Mariki *et al.* 2015), whereas positive perceptions of governance and social outcomes are associated with improved effectiveness (de Koning *et al.* 2016; Oldekop *et al.* 2016).

Having identified the need to consider equity, we are faced with how to define, assess, and track progress toward more equitable conservation. Definitions of equity in relation to conservation highlight three interrelated dimensions: distribution, procedure, and recognition (McDermott *et al.* 2012; Schlosberg 2013; Pascual *et al.* 2014; Sikor *et al.* 2014; Schreckenberg *et al.* 2016). Distribution is concerned with who realizes benefits or incurs

costs (Walker 2012); procedure refers to how decisions are made and by whom (Martin *et al.* 2015); recognition is about the status afforded to different social and cultural values or identities and to the social groups who hold them (De Jonge 2011; Martin *et al.* 2016). Some authors include a contextual dimension as an alternative to recognition, centered on wider political and social processes that influence equality of procedure and distribution (McDermott *et al.* 2012). Although we consider political and social contexts that shape equity to be important, we do not consider context to be a suitable replacement for recognition, which encompasses acknowledgment of and respect for different values by other stakeholders.

Regarding assessment, one option is to develop standardized indicators to measure equity (Lucas *et al.* 2013; Coad *et al.* 2015), mirroring instruments such as the Management Effectiveness Tracking Tool (Geldmann *et al.* 2015). Attempts to measure social impacts of conservation have focused on distribution of material costs and benefits, such as loss of income from access restrictions or gains from revenue sharing (Halpern *et al.* 2013). Indicators have broadened to address features of procedure, particularly inclusiveness of participation measured through attendance at meetings (Lockwood 2010; Macura *et al.* 2015), and elements of recognition by disaggregating impacts between social and cultural groups (de Lange *et al.* 2016). Standard indicators can also be tailored to include stakeholders' subjective perceptions of PA performance regarding the three equity dimensions (Zafra-Calvo *et al.* 2017). However, it is valuable to undertake research that substantively captures stakeholder perceptions and links them to local context, social dynamics, and ecological outcomes (Bennett 2016), which may elicit plural understandings of equity and reasons for divergent viewpoints (Sikor *et al.* 2014). Understanding diversity and uncovering dissonance can help to identify collaborative, adaptive solutions as opposed to implementing standard interventions or governance regimes (Ravallion 2001; McKinnon *et al.* 2015).

Here, we advance current thinking by applying the three-dimensional definition of equity to a PA case study in Laos. We describe different interpretations derived through quantitative indicators and local perceptions and illustrate implications for current practice. We argue that in practice, promoting equity alongside effectiveness requires adaptive management, informed by the perspectives of multiple stakeholders.

Methods

Research was undertaken from February 2014 to July 2015 in three villages adjacent to the Nam Et-Phou Louey

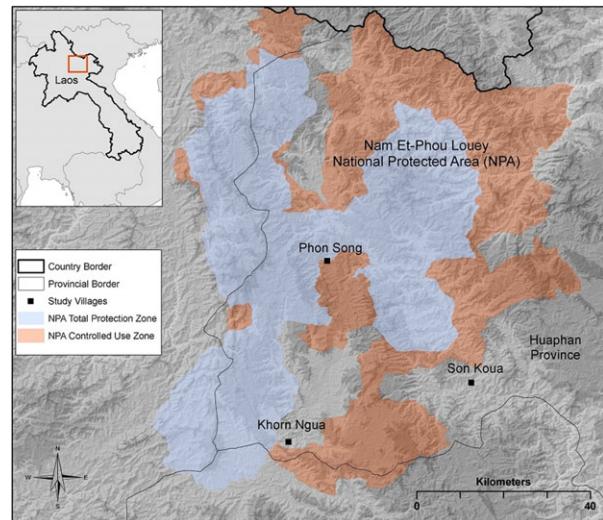


Figure 1 Study area. The location of the three study villages in Nam Et-Phou Louey National Protected Area, Laos.

National Protected Area (NEPL), a montane rainforest spanning 6,000 sq km in northeast Laos, primarily in Huaphan Province (Figure 1).

NEPL was selected for its suitability to explore the relationship between PA equity and effectiveness. First, we propose that equity will be linked to effectiveness at this site—even with the support of the Wildlife Conservation Society, budgets are constrained and effectiveness cannot be bought through enforcement. Second, biodiversity value is high, with at least 18 species of threatened large mammals, including the Indochinese tiger, *Panthera tigris corbetti*. Third, the major effects of the PA are recent. Although established in 1993, boundaries and rules only became enforced after 2000 (Johnson 2012). Fourth, there is a diverse local population dependent on shifting cultivation and forests for their livelihoods, who have lived through complex changes in political and economic context (Vongvisouk *et al.* 2016). Residents experienced civil and interethnic conflict during the Vietnam War (known in Laos as “the American War”), which continued well after Laos’ communist takeover in 1975 (Thalemann 1997). The motive of reconciliation (rather than conservation) underpinned the 1980s policy to relocate all villages out of forests to ethnically mixed settlements along roadsides (Johnson 2012). Since then, rapid modernization of farming practices has led to a shift away from subsistence rice cultivation to cash cropping (Castella *et al.* 2013; Vongvisouk *et al.* 2016). Fifth, the PA zonation allows for comparison of villages with different experiences of the PA. Land-use governance within and outside NEPL is currently formulated by PA management and local authorities through consultative land-use

Table 1 Quantitative and qualitative indicators used in this study to evaluate dimensions of equity

Equity dimension	Description of quantitative indicators	Description of qualitative indicators
Distribution	Household income from farming (monetary value 2004 and 2014 ^a) Land holdings (number of fields and size in hectares, 2004 and 2014) Household income from forest products (monetary value 2004 and 2014) MPI ^b (2004 and 2014) Level of household debt (monetary value 2004 and 2014) Land lost to the PA since boundary demarcation (number of fields and size in hectares) Fines incurred through breaking PA rules (monetary value)	Perceived changes in income, poverty, and well-being Perceived changes in food security Perceived impacts of PA management on land and resource access Perceived drivers of changes in land use Perceptions of winners and losers resulting from management interventions Perceived adequacy of alternative resources or compensation
Procedure	Attendance at meetings where PA boundaries were agreed Expression of agreement with PA boundaries at meetings Whether subsequent actions taken considered commensurate with agreements Extent to which PA rules are upheld by different stakeholders (numbers recorded breaking rules)	Perceived opportunities to participate in and exert influence over PA decision-making Perceived fulfillment of responsibilities or commitments made by PA authority to communities Perceived transparency, consistency, and fairness of rule enforcement by PA authority Perceived accountability for decision-making
Recognition	Changes in income from farming and natural resources, differentiated by ethnic group, gender ^c Changes in land holdings by ethnic group, gender MPI by ethnic group, gender	Perceptions of benefits and burdens based on relative social status or sociocultural difference Perceived impacts on socially and culturally important livelihood activities Perceptions of how well current and expected benefits from conservation fit with local identities and aspirations

^aWe evaluated changes over the 10 years from 2004 (soon after NPA establishment) to 2014 for some metrics using participant recall, further supported through additional questioning.

^bThe MPI comprises 10 indicators for health, education, and standard of living (Alkire & Santos 2014).

^cGender differences relate only to female-headed households as quantitative data pertained to households rather than individuals.

planning at village level, which includes household surveys (Broegaard *et al.* 2017).

We selected three study villages with similar histories of resettlement, but different governance contexts: Phon Song bordered by “total protection zone” with no entry or resource use allowed, Khorn Ngua where the PA border was negotiated so that the village adjoins a “controlled-use zone” where resource use is regulated, and Son Khua where a buffer of “controlled-use zone” exists but an ecotourism scheme also employs villagers and distributes monetary benefits to each household.

Research comprised: (1) An initial period to develop trust with participants, alongside informal discussions, key informant interviews and participant observation to understand social practice and links to natural resources. Key informant interviews were held with village heads, committee members, shop keepers, and others covering different social and forest-user groups; (2) Focus group discussions to strengthen awareness of local context including participatory mapping and participatory well-being dialogues (establishing what resources participants

considered important to live a “good” life in local context); (3) Semi-structured interviews with randomly selected individuals from 100 households to collect quantitative data representing distribution, procedure, and recognition and qualitative data to represent participants’ perceptions of those dimensions (Table 1). Thirty semi-structured interviews were conducted in both Phon Song and Khorn Ngua, which held 50 and 60 households, respectively, and 40 in Son Khua to gain more coverage of its 178 households. Households were selected randomly from lists maintained by village authorities. Either adult male or female were interviewed depending on preference and availability. A further 10 life history interviews (with a randomly selected subsample from semi-structured interview participants) were conducted in each village to further explore participants’ social and cultural values, and changing links to natural resources. Ethnic representativeness of villages and households were not selection criteria and no Hmong groups were represented, although selected villages comprised a variety of ethnicities present in the region (Table S1).

Interviews were conducted in Lao by two native Lao researchers and written answers later translated into English. Responses were coded into various issues and equity dimensions using Nvivo 10 (QSR 2012).

Results

Distribution

Socioeconomic data from interviews revealed that income increased in all three villages between 2004 and 2014, driven by the transition from subsistence-based shifting rice cultivation to maize cash cropping. In 2014, 92 of 100 sample households grew and sold maize. Average annual cash income from farming had risen from negligible in 2004 to approximately \$875 per household (Table S1). The multidimensional poverty index (MPI), measuring indicators of health, education, and standards of living (Alkire & Santos 2014), halved between 2004 and 2014 in all three villages with only 20% considered multidimensionally poor in 2014 compared to 59% in 2004 (Table S1). This change is not attributable to the PA but to broader economic processes and greater access to services. However, the PA affected the dynamics of this transition, primarily by mediating access to land. In Phon Song (Figure 1), where the “total protection zone” bordered the village, land holdings were smaller on average and farm incomes lower than other villages due to constraints imposed by the PA ($P < 0.05$, Table S1). Consequently, farmers in Phon Song were less able to rotate fields, and despite taking loans to intensify inputs (Table S1), experienced falling yields. This land scarcity led to widespread illegal forest clearance, with key informant interviews revealing 11 out of 60 households in Phon Song were charged for encroachment into NEPL during 2013 alone. While few respondents in Phon Song reported having lost land to the PA (7% of households compared to 30% in Khorn Ngua), land access was nonetheless constrained by PA boundaries. By contrast, those in Khorn Ngua were legally able to expand cultivation into land outside NEPL.

Access to forest products remained possible in village forests, fallows, and the controlled-use zone. Hunting and fishing were still practiced by all but three of the 100 households and meat was rarely purchased. In Phon Song, 77% of interviewees “never” bought meat, and only 7% bought meat more than once per month. Seventy-four percent of sample households gained income from forest products in 2014 averaging over \$125 per household per annum across all villages.

Our attempts to quantify equity in terms of distribution of material costs and benefits highlighted the higher burden of land scarcity faced by Phon Song, a result of its

proximity to the total protection zone. Inequity was perceived in relation to an absolute scarcity of land, rather than having been treated badly relative to others. Villagers’ main strategy for coping was to expand cultivation into the PA (evidenced by interview testimonies and supported by the relative prevalence of fines in Phon Song), compromising conservation effectiveness. Through spatial analysis of land-use change and land-use planning consultations, this issue also came to the attention of PA managers. In early 2015, to address the problem, authorities began the process of degazetting part of NEPL to be farmed.

In addition to absolute land scarcity in Phon Song, qualitative interviews and focus groups revealed perceptions of relative inequity regarding distribution of land within villages. These feelings did not lead to expansion of cultivation into the PA but fuelled some resentment toward it. PA boundaries had restricted land availability and had also formalized boundaries and land access regimes. This disadvantaged some households who were unable to claim sufficient land—because they lacked labor at that time, lacked social connections, or had not yet been resettled into that village. Although the PA was incidental in producing this distributional inequity, subsequent procedures governing, and not always prohibiting, farming within NEPL had unequal effects that amplified inequities of land access (Table S2), a procedural inequity described below.

Procedure

Indicators of procedural equity included levels of attendance at meetings where PA borders were agreed. As a measure of transparency and accountability, we evaluated whether subsequent actions complied with these agreements. Across the three villages, 79% of those interviewed had both attended the meetings and—at that time—agreed with the boundary demarcation, while only 6% had disagreed or voiced concerns. Of those present at meetings, all felt subsequent management actions had complied with the formal agreements made (Table S1). However, in contrast, interviewees consistently articulated dissatisfaction with lack of influence over PA decisions (Table S2). Pledges of livelihood support by PA staff were an important factor in gaining local agreement when borders were demarcated, but failure to subsequently provide this support was perceived as a broken promise.

Qualitative interviews also uncovered that while wealthier, more powerful households could take risks in clearing and cultivating additional land within the PA or negotiate informal permission, poorer households were less inclined to risk fines and less able to negotiate,

further concentrating land ownership (Table S2). Even forested land within park boundaries was reported to be informally “booked” by more powerful households. Recently encroached farmland was poorly represented through quantitative indicators, being difficult to detect and largely unreported in survey data. The allocation of more land from the PA to Phon Song village might help to address the absolute scarcity experienced in Phon Song, but it did not address these intravillage inequities. For this reason, it was met with disdain by poorer inhabitants who suggested it served only to exacerbate the maldistribution (Table S2). This led less powerful villagers to call for greater enforcement and more consistent, transparent application of rules (Table S2), revealing one example where demands for equity are aligned with conditions for conservation effectiveness (Table 2).

Recognition

While our research included questions about local forest-related values, such as traditional hunting, gathering, and spiritual activities, these aspects of recognition were not reported as important equity concerns for the different groups within our sample. This is in part because hunting, fishing, and collection of products still thrived outside NEPL or in the controlled-use zone. Twenty-four of 100 interviewees reported they still hunt large mammals and only two households had received fines for illegal hunting. We analyzed data to look for inequalities across social groupings but found no important differences. Poverty and land scarcity were equally prevalent for a minority of each ethnic group. None of the 28 female interview respondents perceived equity issues to be gender-related and none of the five female-headed households had lost land to or been fined by the PA.

However, in semi-structured and life history interviews, participants described that their values, identities, and aspirations were changing in ways that kindled recognition-based equity issues, with strong implications for PA effectiveness. Without exception, people had become more economically, socially, and culturally connected to distant people and markets. Traditional shifting cultivation practices were now widely perceived to be arduous, time-consuming, and risky (Table S2). Most favored growing permanent crops, enabling diversification toward nonfarm activities to support increasing expenditure needs. In 2014, 44 of the 100 sample households already received more than \$250 per annum, and often much more, from nonfarm work (Table S1). Participants no longer prioritized support for shifting cultivation but instead wanted land fit for permanent livestock pasture and flatter land in valleys more suitable for permanent cultivation of paddy rice or fruit trees (Table S2).

This emerging preference for specific land types reflects changing perceptions of PA-related costs, benefits, and procedures and led to demands in each village for land within park boundaries. This included demand for farmland near pre-1980s village locations, resurrecting place attachments and land claims that had been dormant for 30 years. Claims over PA land were being pursued with local authorities and PA staff, both in letters and at meetings. Broken promises and lack of response to communications represented failures of recognition and procedure, while perceptions of distributional outcomes were being reconceived in a more negative light. In this evolving equity context, the additional allocation of degazetted land in Phon Song was not sufficient to satisfy evolving aspirations and associated notions of equity (Table S2). Villagers proposed a variety of alternative interventions to enhance perceived fairness, including: reduced uncertainty in contract farming prices; support for soil and water management outside NEPL; provision and marketing of perennial crops; and developing markets for nontimber forest products (Table 2).

Discussion

The way equity is defined, assessed, and operationalized may influence whether it can be aligned with efforts to enhance conservation effectiveness (Forsyth 2015). Our study reveals the benefits of defining equity broadly to consider all three dimensions of distribution, procedure, and recognition. Oversimplification and reliance on standardized indicators may forego opportunities to identify solutions and minimize trade-offs between equity and effectiveness in ways meaningful to those affected.

A focus on material distribution of costs and benefits emphasized a sense of inequity arising from scarcity of access to land. This issue was acknowledged by the PA authority through their own land-use planning processes, and acted upon through degazetting part of the PA to be converted to farmland. However, exploring local perceptions of all three dimensions provided enhanced understanding of local equity concerns. Specifically, concerns about broken promises of support and inequalities of status underpinning unequal access to land (matters of recognition and procedure) negatively colored people’s perceptions of distributional outcomes. The allocation of additional lands failed to address these procedure- and recognition-related sources of inequity and the proposed solution was therefore considered insufficient. Our results highlight that a richer, contextualized understanding of equity concerns gained through exploration of local perceptions can contribute to solutions that align equity with conservation effectiveness (Table 2).

Table 2 Equity issues identified by research into distribution, procedure, and recognition dimensions, impacts implied for PA management, and relevant conservation management responses either in place or suggested by villagers participating in the study

Approach	Equity issue identified	Implied impacts on the PA (per study data)	Conservation management response (either current measures denoted by ^a or suggested by study participants)
Distribution	1 Increased farm income for many villagers due to introduction of cash crops	1 Stronger incentive to clear land for agriculture	1.1 Ranger patrols in PA. High fines for noncompliance ^a 1.2 Participatory land-use planning to establish land-use boundaries ^a
	2 Reduced access of villagers to land in core conservation area (intervillage difference)	2 High level of encroachment of villagers in core conservation area. Conflicts with authorities	2.1 Retraction of PA boundary ^a 2.2 Support more effective use of farmed land through improved access to inputs and markets 2.3 Compensate affected villages by distributing proportionally more livelihood and infrastructure support to them
	3 Inequitable access to land both inside and outside the PA (intravillage difference)	3 Encroachment by wealthier households while inequality and poverty increase	3.1 Target conservation benefits toward households lacking land or suffering poverty 3.2 Promote fairer allocation of land within villages
Procedure	4 Inequitable access to land both inside and outside the PA (intravillage difference)	4 Encroachment by more powerful villagers through negotiation, corruption, and inconsistent rule enforcement	4.1 More consistent and transparent rules, enforcement, and dispute resolution mechanisms 4.2 Promote influence of communities, particularly marginalized people, in land-use decisions 4.3 Improve land-use planning and strengthen intravillage land allocation procedures
	5 Broken promises of support, nonfulfillment resulted in dissatisfaction	5 Loss of local support for conservation and reduced rule compliance	5.1 Increase accountability and transparency in PA boundary negotiations 5.2 Acknowledge and fulfill past promises of support 5.3 Regulate access to and sale of forest products
Recognition	6 Changing aspirations for new, diversified farming and nonfarming livelihoods leading to altered perceptions of equity	6.1 PA perceived to restrict ability to adapt to change. Inadequate support provided 6.2 Increase in claims for provision of land within PA for permanent farming	6.1 Provide benefits aligned with contemporary values and aspirations rather than for continuing shifting cultivation 6.2 Enable involvement of villagers and transparent processes for determining possible benefits to be distributed

^aManagement response that corresponds with the existing management regime in the PA.

Another key finding is that equity concerns are dynamic. For example, participation is an ongoing process and occurs through diverse formal and informal interactions in multiple forums (Cornwall 2008). Similarly, recognition issues did not relate to easily definable factors such as gender, religion, or ethnicity. Instead, they related to less quantifiable, dynamic features of social and aspi-

rationality. This finding is in line with previous research illustrating equity issues to be complex and evolving (Walker 2012; He & Sikor 2015; Martin *et al.* 2015). By revealing dynamic equity issues that tend to straddle distribution, participation and recognition, and exposing equity as an ongoing motive for local communities' actions, our study suggests equity is not an objective to be

realized by implementing a single set of measures, but rather something to adaptively advance toward. Adaptive management of ecosystems involves engagement of local stakeholder groups rather than reactionary “carrot and stick” incentives and punishments (Armitage *et al.* 2009).

Building mutual understanding and trust, and developing dialogue, will be central to efforts to enhance equity and to identify alternative management solutions beyond standard practices (Hill *et al.* 2015). This will require endeavors to confront the power inequalities, entrenched injustices, and procedural failings that in many cases continue to impede long-term conservation effectiveness.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

Table S1. Indicators representing dimensions of equity for 100 respondents across three villages at Nam Et-Phou Louey National Protected Area, Laos.

Table S2. Examples of qualitative interview and focus group data from which findings were derived.

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