

## REVIEW

# Missing the trees for the wood: Why we are failing to see success in pro-poor conservation

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**Abstract**

Pro-poor conservation strategies are touted as a panacea for achieving biodiversity conservation and poverty reduction, yet there remains limited evidence for success in achieving these dual objectives. Is this lack of evidence a sign that the approach is failing or an indicator that we are not capturing appropriate measures of success? In this review, we demonstrate that the lack of evidence for success in pro-poor conservation can be attributed to focusing on the bigger picture and overlooking the details. This has led to two fundamental flaws, (1) an ambiguous use of definitions and (2) inappropriate monitoring, both of which are compounded by limited understanding between traditional scientific disciplines and which render true conclusion of success impossible. Due to the current lack of evidence, pro-poor conservation risks basing decisions on belief rather than evidence, repeating mistakes and missing opportunities to replicate successes. We propose five key recommendations that will facilitate the identification of successful pro-poor conservation interventions and the conditions under which they work. Adoption of these recommendations will ensure pro-poor conservation is built on clear definitions and engages in meaningful participation with rigorous monitoring and reporting of outcomes, aiding replication and scaling up of pro-poor conservation successes in intelligent and evidence-based ways.

**Introduction**

The current decline in biodiversity is of great concern, not only because of the loss of its intrinsic value and the unknown impacts on ecosystem functioning, but also because of the potential negative repercussions for human well-being (Cardinale *et al.*, 2012; Reich *et al.*, 2012). Addressing biodiversity loss and poverty are international societal and political goals (Sachs *et al.*, 2009; Roe, 2010). Each year the world spends around US\$126 billion of official aid tackling global poverty and US\$8–12 billion on addressing biodiversity loss (Roe *et al.*, 2011), yet in neither case are these resources considered sufficient to solve these challenges (Roe *et al.*, 2011; Evans *et al.*, 2012). The majority of the world's poor live in rural areas (International Fund for Agricultural Development, 2010) where they depend disproportionately on biodiversity for their survival (Belcher, 2013). This relationship has led to the explicit assumption that conserving biodiversity can help address global poverty, and in light of pressing challenges, such as population growth, overconsumption and climate change, there is a strong need for further integration of the poverty

alleviation and biodiversity conservation agendas (Sachs *et al.*, 2009).

The integration of these agendas has so far proved more difficult and more expensive than many had hoped (Adams, 2013). Conservation activities first started to address development issues in the 1970s, motivated by the substantial negative impacts on local people born from earlier 'fortress' conservation activities (Adams *et al.*, 2004). The projects conducted according to this 'people-friendly' approach, broadly termed integrated conservation and development projects (ICDPs) (Blomley *et al.*, 2010), initially attracted substantial support from international development agencies and conservation NGOs, and were rather hurriedly accepted as a panacea for conservation and sustainable development. However, early results proved disappointing, and the approach rapidly fell out of favour (McShane *et al.*, 2011; Miller, Minter & Malan, 2011). The ICDP label is now less common, but biodiversity conservation and poverty reduction continue to be addressed as dual goals; the extent to which this is so largely depends on the perceived role of poverty in determining the status and threats to the intended conservation target (Sandbrook & Roe,

2013). Adams *et al.* (2004) proposed a typology of four positions conservationists may take to the question of poverty: (1) poverty and conservation are separate policy realms; (2) poverty is a critical constraint on conservation, meaning it must be tackled to achieve conservation goals; (3) conservation activities must not compromise poverty reduction; and (4) poverty reduction is a goal dependent on resource conservation. Recognizing these fundamental differences in value positions can help contextualize the projects rationale, objectives and behaviour of different actors, particularly when they are faced with difficult trade-off decisions between conservation and development goals (Leader-Williams, Adams & Smith, 2011). Truly addressing the dual goals of biodiversity conservation and poverty reduction requires adopting the fourth position detailed by Adams *et al.* (2004), an approach known as 'pro-poor conservation' and defined as 'a people-centred approach that has poverty reduction and livelihood security as core objectives and seeks robust conservation approaches to achieve these' (adapted from: Roe *et al.*, 2003; Roe & Elliott, 2006; Kaimowitz & Sheil, 2007). It builds on the poor's priorities and capabilities, effectively engages all stakeholders in addressing the underlying policy and institutional drivers of environmental degradation and empowers vulnerable groups with the assets, rights and entitlements they need to improve their lives through sound environmental management (Hazlewood, Kulshrestha & McNeill, 2004). Pro-poor conservation can take a number of different forms and encompass a variety of approaches, including: community-based conservation initiatives, direct payments (REDD+) and locally managed protected areas.

Despite biodiversity conservation and poverty reduction being addressed as linked challenges for a number of years, there is growing concern over the lack of empirical evidence for these endeavours (Barrett, Travis & Dasgupta, 2011). An extensive review by Leisher *et al.* (2013b), although constrained by the limited number of studies with robust evidence of poverty impacts, was able to highlight ten conservation interventions that had contributed to poverty reduction. However, this review also found that only four of these ten initiatives benefited the poorest (see Table 1 and Leisher *et al.*, 2013b for further details). Despite the dearth of empirical evidence for success, there is still broad consensus among conservation professionals that there is a positive link between biodiversity conservation and poverty reduction (Roe *et al.*, 2012). However, without empirical evidence, pro-poor conservation risks basing decisions on belief rather than evidence, repeating mistakes, and missing opportunities to replicate successes (Pullin *et al.*, 2013).

In this review, we synthesize the latest literature from the conservation, development and interdisciplinary realms. Our aim is not to add to the debate on whether conservation can contribute to poverty reduction, which distracts from the real task of improving the effectiveness of conservation–poverty reduction integration (see Roe *et al.*, 2012), but rather to take the issue back to basics and evaluate reasons for the lack of evidence for success. Through this review we

**Table 1** Summary of conservation interventions shown to provide poverty reduction benefits and those which benefited the poorest

Intervention	Number of studies	Benefits the poorest
Commercialization of non-timber forest products	> 50	Yes
Community forestry	> 50	Yes
Payments for ecosystem services	10–50	
Nature-based tourism	10–50	
Locally managed marine areas	10–50	Yes
Mangrove conservation	10–50	Yes
Protected-area jobs	< 10	
Agroforestry	10–50	
Grasslands	< 10	
Agro-biodiversity	< 10	

Source: Adapted from Leisher *et al.* (2013b).

hope to clarify key terms and concepts and provide recommendations to move pro-poor conservation forward.

## Ambiguous use of definitions

Key concepts are often not explicitly defined in pro-poor conservation efforts (Lu, 2010; Roe, 2010; Roe *et al.*, 2013), leading to vague objectives and preventing data aggregation and comparison (Kapos *et al.*, 2008). Poor or narrow definitions are the root cause of limited empirical evidence in pro-poor conservation: how a concept is defined determines what is measured, and what is chosen to be measured determines how success is defined (Leisher *et al.*, 2013a).

## Poverty

Our understanding of poverty has evolved considerably from its original definitions, which focused on a lack of income or wealth (Sen, 1993; Roe, 2010). It is now viewed as a multidimensional concept, encompassing material deprivation, the lack of access to basic needs such as education, health, nutrition and food security, and the absence of political autonomy and empowerment, as well as the lack of freedom of choice and social inequality (Chambers, 1995; Shackleton *et al.*, 2008; Sunderlin *et al.*, 2008). Interest in multidimensional poverty measurement has been growing steadily over the last decade (Alkire & Foster, 2011; Ravallion, 2011; Ferreira & Lugo, 2012), and mainstream poverty research has become more sophisticated in its handling of this concept, both through a diversification of methods and through more inclusive processes of assessment that include the perspectives of the poor (Addison, Hulme & Kanbur, 2009).

While the set of deprivations to be measured will vary depending on the social context, example indicators can include school attendance, access to safe drinking water, ownership of durable assets and nutrition (Alkire & Foster, 2011). Patterns of associations across multiple dimensions of poverty can be explored through simple tabulations, Venn diagrams or stochastic dominance analysis (Ferreira

& Lugo, 2012); they can also be aggregated into indices, such as the Multidimensional Poverty Index (Alkire & Foster, 2011) or the Human Poverty Index (Dhillon & Kaur, 2010). Poverty can be defined in either relative or absolute terms. Absolute terms measure poverty in relation to the amount of money necessary to meet basic needs, whereas relative poverty is defined in relation to the prevailing standards of living of other members of the society (Scheidel, 2013). The decision whether to use absolute or relative poverty is ultimately a value judgement dependent on the main purpose for which the poverty measure is to be used. Where the relative definition is adopted, it is important to find a locally appropriate understanding of a certain social group or context (Scheidel, 2013). In either case, the chosen dimensions across which poverty has been defined and measured must be explicitly stated, as conceptual and methodological differences in defining poverty can lead to the identification of different individuals and groups as poor (Lu, 2010).

Although reports of pro-poor conservation studies discuss poverty as a multidimensional concept, this is not translated into how poverty is measured, which remains confined to narrow income indicators (Scheidel, 2013; Leisher *et al.*, 2013b). This is despite income being known as an insufficient indicator of poverty reduction in isolation and having a low rank among the items by which the poor define their well-being (Chambers, 1995; Brandolini, Magri & Smeeding, 2010; Ferreira & Lugo, 2012). Furthermore, poverty reduction in the income-poverty sense does not capture the complexity of livelihood and well-being-related objectives from local points of view (Berkes, 2013), and these simplistic definitions of poverty have misdirected conservationists regarding the question of community wants and needs, leading to narrowly conceived conservation benefits and incentives for local people (Murphree, 2009; Berkes, 2013).

The dispersion of a distribution of income, consumption or other welfare indicator (i.e. its inequality) is also an important dimension that is largely ignored. Inequality is

moving to the forefront of the development policy agenda due to recognition of its relationship to poverty and poverty reduction (Melamed, 2012): inequality directly determines the rate of poverty reduction, and certain types of inequalities (e.g. access to health care, education or markets, or civil and political rights) have a direct causal effect on poverty (Jones, 2009). Equity has largely been addressed indirectly in pro-poor conservation – through implicit assumptions about spreading the costs or benefits, or as a secondary concern, as with *post hoc* comparisons of the equity of outcomes (White *et al.*, 2012). Pro-poor conservation would benefit from a focus on inequality, as this would provide an incentive to focus on those groups that are left behind.

## Biodiversity

Biodiversity is defined by the Convention on Biological Diversity as ‘the variability among living organisms from all sources including diversity within species, between species and of ecosystems’ (CBD, 1992). However, biodiversity is often used to refer to an amount in terms of species and populations or to specific elements of biodiversity rather than variety *per se* (Roe *et al.*, 2013). Biodiversity, like poverty, is a fundamentally multidimensional concept (Lyashevskaya & Farnsworth, 2012): it can be measured in terms of different components (genetic, population/species, and community/ecosystem; see Table 2). Each of these components has compositional, structural and functional attributes; these categories can be considered the ‘three dimensions’ of biodiversity (Lyashevskaya & Farnsworth, 2012). This means that no single level of organization (e.g. gene, population, community) is fundamental, and different levels of resolution are appropriate for different questions (Noss, 1990).

Due to the sheer number of species and the difficulty of sampling many ecosystems, measurements need to be simplified into tractable, quantifiable units that can be compared across time and space (Bradshaw & Brook, 2010). Organism-based metrics that count the number of distinct

**Table 2** Indicators of attributes and components of biodiversity with a focus on measures that would be most useful in determining potential effects of human use on biodiversity

Attributes/Components	Composition	Structure	Function
Genetic	Allelic diversity	Heterozygosity Heritability	Gene flow Genetic drift Mutation rate Selection intensity
Population/ species	Species abundance Biomass Density	Population structure, dispersion and range	Fertility Mortality Survivorship Life history Phenology
Community/ ecosystem	Relative abundance of guilds or life forms Proportion of exotic or endemic species	Spatial geometry and arrangement of patch types	Disturbance regimes Nutrient and energy flows Biomass productivity Patch dynamics

Source: Agrawal & Redford (2006).

species in a defined area (species richness) are the most common (Bradshaw & Brook, 2010). However, species richness is arguably a narrow and poor estimate of biodiversity (Lyashevskaya & Farnsworth, 2012). Metrics that accommodate a broader definition of biodiversity have been developed (summarized in Williams, 2004), and there is a growing recognition of the functional, phylogenetic and taxonomic aspects of biodiversity in conservation biology (Lopez-Osorio & Miranda-Esquivel, 2010; Mouchet *et al.*, 2010; Strecker *et al.*, 2011).

There are two main problems with the use of the term 'biodiversity' in pro-poor conservation. Firstly, where biodiversity has been defined, it is typically measured using a narrow perspective, such as species richness, or a proxy that does not include any ecological information, such as perceptions of change in animal populations or attitudes towards conservation (Agrawal & Redford, 2006). Broader approaches to defining and measuring biodiversity have yet to be incorporated into pro-poor conservation efforts. Conservation measures that aim to enhance a specific attribute or component of biodiversity may have unanticipated effects on other measures of biodiversity; multiple measures targeting specific combinations of attributes and components of biodiversity are therefore needed (Agrawal & Redford, 2006). Secondly, the components used to frame biodiversity are often not clarified, rendering the collected data meaningless. Knowing the biodiversity (however measured) of one place, group or time is not useful in itself; it is the comparable measurements of biodiversity from multiple places, groups or times that can be used to answer crucial questions about how we might best act to conserve it (Purvis & Hector, 2000).

## Inappropriate monitoring

Another reason for the lack of evidence for success for pro-poor conservation is the lack of monitoring and inconsistent reporting of outputs or outcomes. Continual and independent evaluation of conservation interventions is a prerequisite to ensuring that conservation is appropriately targeted and effective (Saterson *et al.*, 2004; Sutherland *et al.*, 2004), in addition to ensuring that conservation fulfils its ethical responsibility to do no harm (Barrett *et al.*, 2011). But as with mainstream conservation, pro-poor conservation initiatives have struggled with designing appropriate methods for monitoring and evaluating project progress and outcomes (Blom, Sunderland & Murdiyarto, 2010). This lack of evaluation has restricted opportunities to learn and improve pro-poor conservation through adaptive management (Saterson *et al.*, 2004).

Successful pro-poor conservation strategies occur across a variety of dimensions, including attitudinal, behavioural, economic and ecological (Wamukota, Cinner & McClanahan, 2012). Data that cover only one or two of these dimensions have limited analytical value and can overlook trade-offs between outcomes (Daw *et al.*, 2011; Brooks, Waylen & Mulder, 2012). For example, an extractive reserve may be considered a success by an economist

based on increased income for local inhabitants, but a failure by an ecologist or an anthropologist based on critical population decline within the ecosystem and an absence of changed community values regarding conservation (Waylen *et al.*, 2010; Brooks *et al.*, 2012). Consequently, in order to effectively determine success of a pro-poor conservation strategy, measures are needed across the distinct dimensions, as defined by the expected outcomes (Wamukota *et al.*, 2012). Furthermore, monitoring data for pro-poor conservation initiatives is rarely disaggregated for the poorest (or by ethnicity, gender, religion, etc.), yet this would facilitate explicit assessment of how equity influences the ability to achieve project outcomes and produce a more nuanced picture of the intervention impacts on different groups (Halpern *et al.*, 2013). Inappropriate monitoring can be attributed to four key problems: ambiguous definitions, donor pressures, lack of understanding between traditional scientific disciplines and lack of adequate reporting.

## Ambiguous definitions

The use of ambiguous definitions cascades to vague objectives and difficulty in developing targets and indicators to gauge performance. Objectives of conservation projects are often not clearly stated or linked directly to individual actions that might be monitored later (Bottrill, Hockings & Possingham, 2011). For example, community-level development activities, such as alternative livelihoods, are often emphasized as an indirect step toward effective long-term biodiversity conservation, but when the link between the activities and the aim are vague, projects tend to focus on ticking off activities, as opposed to monitoring the impacts of these activities (Sayer & Wells, 2004). What, where and how to monitor follows logically from clear and unambiguous objectives and questions (Lindenmayer *et al.*, 2012).

## Donor pressures

Effective monitoring is compromised through the influence of donors' demands and priorities (Bottrill *et al.*, 2011) in three main ways. Firstly, there is a mismatch between the short time frame of funding and the long time frame needed to evaluate impacts on socio-economic conditions and the ecosystem, which often take longer than the funding period to undergo detectable change (Barrett *et al.*, 2011; Pullin *et al.*, 2013). Secondly, projects are influenced by donor priorities and emphasize particular kinds of objectives over others, with the objectives that are less attractive to funders left unstated or poorly articulated (Pullin *et al.*, 2013). Pro-poor conservation projects have multiple objectives, and as a result the total monitoring can be a major drain on finite resources, with managers often reluctant to divert scarce resources from action to monitoring (Gardner, 2010). In addition, the inarticulation of all objectives in the funding proposal means there are often inadequate funds available for monitoring the full range of outcomes (Kapos *et al.*, 2008). Thirdly, neither donors nor conservation organizations have created a culture in which monitoring of



outcomes is seen as desirable in its own right (Kapos *et al.*, 2008). Both individual and institutional concerns about exposing shortcomings have served as a strong disincentive for critical evaluation. In some cases there is also an insidious disincentive for claiming or demonstrating success in that perceived improvements may reduce the case for public, political and/or financial support (Pullin *et al.*, 2013). However, Kapos *et al.* (2008) suggest that the capacity for rigorous analysis and synthesis should provide a strong incentive for evaluation to donors and practitioners alike.

### Limited understanding between traditional scientific disciplines

Monitoring is further compromised through a lack of understanding of social science research by natural scientists, who often lead pro-poor conservation efforts (Lélé & Norgaard, 2005). The collection of social data, such as people's behaviours or perceptions of change, has followed natural scientists' affinity for quantitative data and large sample sizes that allow statistical analyses and broad generalizations (Drury, Homewood & Randall, 2011). But poor understanding of the aims and scope of qualitative methods can lead to the false assumption that social data can be collected in a straightforward manner and interpreted at face value, leading to misinterpretation of the results (Adams, 2007; Homewood, 2013). Natural science research approaches cannot simply be extended to the social science domain, as paradoxically, an emphasis on quantification of social data may compromise data quality and validity (Adams, 2007; Drury *et al.*, 2011).

Ineffective application of social science research methods has also limited monitoring value due to a lack of meaningful participation. Given the range of different dimensions that need to be considered and in order to ensure data quality, the dimensions on which monitoring should focus should be defined by local people's priorities and local interest in contributing to and making use of the results (Homewood, 2013). Local people's participation and inclusion in pro-poor conservation is rarely meaningful and in extreme cases can verge on coercive (Naughton-Treves, 2012). Therefore, what sets out to be a people-centred approach in reality may only 'involve' local communities as recipients of concessions and development assistance (Lele *et al.*, 2010). This ineffective application of social science research methods is ultimately detrimental to what pro-poor conservation sets out to achieve (McShane & Wells, 2004). Successful initiatives require community objectives to be taken seriously and empowerment of all community members (Murphree, 2009). Better application of social science principles – developing an understanding of local aspirations, refraining from manipulating communities and thinking about trade-offs – would help achieve this (Berkes, 2013).

### Lack of reporting

Many project implementers still do not report outputs or outcomes consistently, and consequently there have been few quantitative comparative evaluations (Waylen *et al.*,

2010; Brooks *et al.*, 2012). There is also a potential publication and reporting bias, with unsuccessful cases or metrics less likely to be published (Wamukota *et al.*, 2012). This makes true comparative studies and analyses difficult and strongly limits any attempt to describe relationships between poverty reduction and biodiversity conservation.

## Focussing on the details: Seeing the trees in the wood

Success in pro-poor conservation actions cannot be expected while these fundamental flaws persist, and we believe addressing these flaws must now become a priority. We propose five key recommendations to facilitate the collection of an evidence base that will enable the success of pro-poor conservation strategies to be determined (summarized in Table 3).

### 1. Unequivocal definitions of key terms

Poverty and biodiversity need a multidimensional approach to their definition and measurement, and therefore success also needs to be measured across a variety of dimensions. This will lead to more nuanced questions, such as which groups of the differentiated poor depend on which elements of biodiversity (Roe, 2010; Daw *et al.*, 2011). Poverty, biodiversity and success are context-specific, and the dimensions that have been used to classify them need to be clearly stated, alongside additional contextual conditions that can influence success, such as number of communities, size of population, level of dependence on biodiversity and local governance (Waylen, McGowan & Milner-Gulland, 2009; Wamukota *et al.*, 2012). Baseline data also form part of the context and should be collected at the start of the project to provide a benchmark for comparison with data collected through monitoring of subsequent activities (Bottrill *et al.*,

**Table 3** Current problems with evaluating pro-poor conservation and proposed solutions

Problem	Solution
Ambiguous definitions	Unequivocal definitions of key terms (e.g. poverty and biodiversity) (Roe, 2010)
Inappropriate monitoring	Rigorous monitoring that is efficient and appropriate for purpose (Kapos <i>et al.</i> , 2008)
Donor pressures	Disaggregated data (Daw <i>et al.</i> , 2011) Long-term approach for sustainability Fundamental shift in donor funding (long-term, flexible, etc.) (Bottrill <i>et al.</i> , 2011)
Limited understanding between traditional scientific disciplines	Greater awareness and correct application of social-science principles (Drury <i>et al.</i> , 2011)
Lack of reporting/communication	Systematic reporting of outcomes (whether successful or not) (Hirsch <i>et al.</i> , 2011) Progress for the poorest groups reported separately (Melamed, 2012)

2011). Further work is required on developing and using standard multidimensional measures of biodiversity as the norm, rather than the exception. Species richness has been shown to be a poor surrogate for biodiversity, and consequently an urgent goal is to catalogue species with their significant functional traits in accessible databases to enable field-collected species lists to serve as a key to estimating biodiversity in its fuller meaning (Lyashevskaya & Farnsworth, 2012).

## 2. Rigorous monitoring that is efficient and appropriate for purpose

The idea of rigorous monitoring follows naturally from a thorough understanding of all the dimensions that need to be measured for poverty and biodiversity. A monitoring programme must be designed to be sensitive enough to detect incremental changes and capture the full range of potential outcomes across different dimensions (attitudes, behaviour, ecological and economic; see Margoluis *et al.*, 2009). Appropriate monitoring data will reveal opportunities to learn and develop more responsible management practices (Gardner, 2010). Appropriate monitoring also requires local inputs; equitable participation of all stakeholders is considered central to the adaptive management process and ultimately leads to better results and sustainability (Jacobson *et al.*, 2009).

Monitoring data should be both qualitative and quantitative and collected on different levels and scales (e.g. individual, household and community), as multilevel analyses are critical to understanding the dynamics at the different scales that can affect project outcomes (Brooks *et al.*, 2012). Pro-poor conservation efforts should collect data in as disaggregated a form as possible to facilitate analyses of inequalities and ensure the poorest and most vulnerable are not being left behind. Aggregated data can mask inequalities (UN System Task Team on the Post-2015 UN Development Agenda, 2012), whereas differentiated analyses (e.g. by gender, ethnicity, livelihoods and socioeconomic status; see Daw *et al.*, 2011) can facilitate achievement of conservation outcomes (Halpern *et al.*, 2013) by elucidating the contexts where significant trade-offs are likely to occur (e.g. between the well-being of different people, either between or within communities, or between different outcomes, such as income and food security; Daw *et al.*, 2011).

As project outcomes may not be achieved over the small timescale of the project, indices based on outputs will always be needed (Jones, 2012). Assessing the degree to which intermediate outcomes have been achieved can support adaptive management and provide insights on likely long-term effectiveness of interventions (Kapos *et al.*, 2008; Pullin *et al.*, 2013). For this to be effective, how the delivery of outputs is linked to outcomes needs careful consideration (see planning protocol, Conservation Measures Partnership, 2013). Jones (2012) suggests that for output measures to be more valuable for assessing project success, the linkages between outputs and outcomes, both in project proposals and

reports, should be explicitly stated alongside the evidence upon which the assumption is based (Jones, 2012).

## 3. Long-term approach for sustainability

Pro-poor conservation efforts need to be based on long-term commitment, reflecting the time needed to make the project work (Blom *et al.*, 2010). This will require a level of institutional change among organizations and agencies responsible for funding pro-poor conservation, which will be called upon to (1) provide more long-term and flexible funding, (2) incentivize and promote a culture of adaptive management and prospective ventures in trial and error (Bottrill *et al.*, 2011), and (3) be open to funding 'less attractive' projects that address the needs and threats to the poor and that are not built from predetermined external viewpoints (Kaimowitz & Sheil, 2007).

Poverty reduction can occur through improved governance and strengthening of local institutions, and therefore, for long-term sustainability, pro-poor conservation needs to emphasize community engagement, institution building and the devolution of authority and responsibility to local people (Belcher, 2013). Possibilities and mechanisms for exit (or sustainability) strategy may only become clear after a number of years of successful implementation, although it should be considered in the planning stage, with possible revisions based on achievements during the programme (Young, 2008).

## 4. Greater awareness and correct application of social science research methods

Greater awareness and correct application of social science research methods could be achieved through collaborations across the social and natural sciences. This would improve pro-poor conservation through (1) the adoption of meaningful participation (for further details see Burns *et al.*, 2004), (2) the facilitation of qualitative approaches that complement quantitative methods through acknowledging the limitations of different research methods in a social and cultural context (Drury *et al.*, 2011), and (3) improved understanding of local-level processes and outcomes, particularly with regard to the complex formal and informal governance of common-pool resources. Use of common-pool resources is structured through institutions ('the sets of formal and informal rules and norms that shape interactions of humans with others and nature'; Agrawal & Gibson, 1999); an analysis of these institutions could offer insights for developing appropriate pro-poor conservation activities and could be achieved through the Institutional Analysis and Development framework (see Imperial & Yandle, 2005; Ostrom, 2007, 2009). This would lead to the recognition of factors that can influence pro-poor conservation outcomes at the local level, including power relations and inherent biases of different actors in the research process (Drury *et al.*, 2011).

Likewise, greater collaboration across the social and natural sciences would benefit poverty-reduction

development initiatives, which often result in biodiversity loss (e.g. oil palm versus old-growth forests, dams and downstream impacts) and are generally based on unsustainable patterns of consumption and resource use (see Adams, 2013). Greater collaboration between disciplines would facilitate appropriate evaluation of biological and social outcomes through mitigation of differences in language and concepts between the natural and social sciences (Ostrom, 2009).

## 5. Systematic reporting of outcomes

Systematic reporting of outcomes (whether successful or not) will facilitate identification of effective interventions and the conditions under which they work more consistently, aiding replication and scaling up of these successes in intelligent and evidence-based ways (Rands *et al.*, 2010). Inevitably, there will be trade-offs in pro-poor conservation, but an open and integrative approach to acknowledging the trade-offs incurred by various choices and actions will provide insight and opportunity for genuine reflection, honest communication and responsible action (Hirsch *et al.*, 2011). Meaningful participation and multidimensional measurement of outcomes will help assess potential trade-offs, which should be assessed amongst all outcomes, and could lead to more resilient and sustainable conservation outcomes (McShane *et al.*, 2011). To ensure the poor are benefiting from overall progress, data for the poorest groups should be measured and reported separately (Melamed, 2012). While scientific publications and making data freely available are important for the wider scientific community, regular feedback of findings to stakeholders is also essential; it reaffirms that their involvement is being acted on in a transparent manner and also fosters social learning (Williams, 2011).

## Conclusion

In this review, we have brought together literature from across the natural science, social science and interdisciplinary domains to assess why there is a lack of evidence for success in pro-poor conservation. This paper demonstrates that success is being compromised in pro-poor conservation through a lack of attention to fundamental details in defining key terms and inappropriate monitoring. We propose recommendations that will improve pro-poor conservation through building upon clear definitions and engaging in meaningful participation with rigorous monitoring and reporting of outcomes. Much has been learnt about the failure of ICDPs, but mistakes continue to be repeated, and we are certainly not the first to call for rigorous, systematic monitoring in conservation (e.g. Blom *et al.*, 2010; Bottrill *et al.*, 2011; Jones, 2012). This highlights a disconnect between research and practice that urgently needs to be resolved in order to lead to a culture of effective, rather than simply well-intentioned, conservation practice (Pullin *et al.*, 2013).

Given that the challenges facing biodiversity and inequality worldwide show no signs of diminishing, the rationale

for addressing biodiversity conservation and poverty reduction together is ever more important. In order to increase funding for conservation activities and to encourage donor confidence in conservation investments, there needs to be considerably more attention devoted to developing and applying robust and cost-effective approaches for evaluating success (Jones, 2012). Conservation is currently marginal to the Millennium Development Goals, but building an empirical evidence base for pro-poor conservation could help influence the development of the post-2015 development goals and help development and conservation become more mutually supportive at both international and national levels.

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