



Design considerations in supporting payments for ecosystem services from community-managed forests in Nepal

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ABSTRACT

Despite widespread implementation of payments for ecosystem services (PES), benefits to poor people in developing countries have been limited. The success of PES varies with the local context, policy environment and PES design and its implementation. Until recently, there have been few studies of factors that might contribute to the success of PES and associated outcomes. *Ex-ante* analysis of design considerations is critical in developing a robust and sustainable PES scheme. This research aimed to determine the key elements of PES design and prioritise those likely to support successful PES for community-managed forests using a case in the Phewa watershed in western Nepal. Community perceptions and expert opinion were used to identify 19 design considerations relevant to stakeholders. These were integrated into a PES design index. Analysis using this index indicated that livelihoods, pro-poor participation, tenure arrangements, transaction and opportunity costs, payment structures and government policy were perceived as most important to stakeholders. Although the effectiveness of a PES scheme has often been measured economically or biologically, our results indicate that the most important design considerations for stakeholders were policy, social, financial and institutional arrangements. The analysis indicated that there are often trade-offs between equity, efficiency, and effectiveness involved in achieving livelihood improvements for rural poor and, consequently, the longer-term sustainability of a PES scheme.

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1. Introduction

Payment for ecosystem services (PES) has emerged as an increasingly popular policy tool for natural resource management. While payment for ecosystem goods has been common throughout human history, payments for services were instituted in the 1990s (Wunder et al., 2008) as part of a conservation paradigm to integrate ecosystem services (ES) in economic systems (Bennett and Gosnell, 2015; Wegner, 2016). This paradigm acknowledges first, the positive externalities of activities to conserve and protect natural environments and second, the costs of these activities bring into the market system to provide financial compensation and incentives for adopting management practices that maintain and enhance ES (Grima et al., 2016; Wegner, 2016). In developing countries, PES can encourage improved environmental stewardship of agricultural land and forests (Kosoy et al., 2008) and

discourage activities that lead to deforestation and forest degradation (MEA, 2005).

Hundreds of PES schemes are currently being implemented throughout the world (Brimont and Karsenty, 2015; Ezzine-De-Blas et al., 2016) with design features guided by both environmental and ecological economics (Gomez-Baggethun et al., 2010). Much of the current focus of PES research is aimed at understanding how to shape the design of these schemes to improve their efficiency and effectiveness (Farley and Costanza, 2010; Muradian et al., 2010; Tacconi, 2012) and to address trade-offs in the delivery of different types of goods and services (Porrás et al., 2013). Other PES design issues are associated with equity issues, including participation of multiple stakeholders, the scale of application and the type of financing (Ezzine-De-Blas et al., 2016) for optimisation of benefits (Kolinjivadi et al., 2015b).

PES schemes have therefore usually been customised to the local context. This is a complex task as local issues have an impact on the extent to which payment schemes prioritise social equity and benefit sharing as well as economic efficiency and effectiveness (Guerra, 2016). In addition, the effects may be spatially and socially heterogeneous (Adhikari and Boag, 2013). A deeper

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understanding of the local social, economic and political context is therefore required for a robust and sustainable PES scheme (Guerra, 2016; Kaczan et al., 2013). PES schemes need to consider the biophysical aspects of the ecosystems in question and the economic theories that underpin markets (Farley and Costanza, 2010). Only a few studies have addressed institutional dynamics (Kosoy and Corbera, 2010; Muradian et al., 2010; Rai et al., 2016), policy dialogue (Muradian et al., 2013) and social inclusion (Pagiola et al., 2010). In developing countries, many environmentally important areas are impacted by poor people to sustain their subsistence livelihoods (Milder et al., 2010), but few studies have focused on how livelihoods and poverty reduction goals can be integrated into the PES (Fisher et al., 2014, 2013). Therefore, design considerations should be examined to integrate equity, effectiveness and efficiency and to increase social acceptance of PES scheme (Kolinjivadi et al., 2015a; Schomers and Matzdorf, 2013).

The equitable distribution of burdens and rewards between individuals or groups of people is a central pillar of sustainable development (WCED, 1990) and a key criterion for successful environmental governance (Adger et al., 2003; Klein et al., 2015). Equity in obtaining benefits from natural resources is related to resource access, decision-making roles, a fair share in outcomes, livelihood security and respect for the choices and priorities of local communities (Corbera et al., 2007; Poudel et al., 2015). However, forest conservation and management actions can benefit some groups more than others, and this raises questions about their sustainability (Klein et al., 2015). Equity has therefore emerged from environmental justice and fairness concerns, particularly for those people most affected by conservation actions and highly dependent on natural resources for their livelihoods (Klein et al., 2015). In the case of CBF, such concerns have been raised for the welfare of those communities who are disadvantaged and whose livelihoods are vulnerable to the changes that PES seeks to drive.

Therefore, a key concern in the design of a PES scheme in the developing world is whether people living in poverty participate in, and benefit from, the scheme. Tenure security over community resources can be critical in this context (Larson et al., 2013). Inclusion, collective actions and access to information can enhance local capacity that is crucial for PES success. On the other hand, high transaction costs and financial incentives that are less than the opportunity costs incurred can hinder the adoption of PES in developing countries (Adhikari and Agrawal, 2013). If appropriate considerations are taken into account during PES design, poor people can participate and receive benefits (Bennett and Gosnell, 2015; Pagiola et al., 2010), building the public support that is vital for longer-term sustainability and effectiveness of such schemes.

In Nepal, vast areas of forests were severely degraded or converted to farmland from the 1950s to the 1970s as a result of forest nationalisation in the late 1950s (Gautam et al., 2004). The prospect of an environmental crisis as a result of massive deforestation was voiced by the mid-1970s (Eckholm, 1976, 1975) with concerns raised over landslides and water scarcity in the mountains and flooding in the lowlands (Gautam et al., 2004). Although the focus on the cause of the landslides was later found to be exaggerated, the failure of traditional state forest management to maintain forest cover and subsequent loss of local forest benefits and services led to the development of community-based forestry (CBF) in the late 1970s (Gautam et al., 2004). The success of this movement in restoring forest cover has been underpinned by local community forestry users groups (CFUGs). These groups have been supported by the national government and international donors but there has generally been no explicit link drawn between their activities and the provision of ES or improved biodiversity (Birch et al., 2014; Paudyal et al., 2017b, 2015). Growing understanding of the relationship between forest cover and the provision of

different types of services, and the mechanisms to provide financial incentives associated with these outcomes indicates a potential opportunity to boost funding for these groups (Paudyal et al., 2018). While some lessons have been learnt from PES-like mechanisms and REDD+ initiatives in Nepal that illustrate the potential for improved livelihoods and poverty reduction from such payments and incentives (Bhatta et al., 2014), the requirements for an efficient and sustainable PES system for CBF have not been explored (Paudyal et al., 2016).

This study focuses on the Phewa watershed, a landscape that was heavily degraded (Fleming and Fleming, 2009) resulting in heavy siltation to the Phewa Lake, a major water and tourism asset in western Nepal (Fleming, 1983). Landscape restoration started in the late 1970s, initially with a focus on engineering solutions but later shifting to community-based conservation and CBF (Paudyal et al., 2017c). Continuous efforts from the local communities, government and international agencies resulted in the restoration of forest cover, reduction in soil erosion, improved water quality and biodiversity (Baral et al., 2017; Fleming and Fleming, 2009).

The study aimed to investigate design considerations for applying PES in the Phewa watershed and to prioritise such considerations to achieve effective policy decisions and successful implementation. It sets out an approach for assessing and prioritising PES design considerations based on an analysis of the views of rural and urban people, as well as experts, living and working in the watershed.

2. Methods

2.1. Analytical framework

The PES designs and their intended outcomes require consideration of both their effectiveness in meeting biophysical objectives for service beneficiaries, the efficiency of allocation of resources to achieve these objectives and if equity is a goal, the level of participation and distribution of payments transparently to a range of potential service providers (Loft et al., 2017). PES schemes have often focused on maximising economic efficiency in meeting environmental outcomes at the cost of equity (McDermott et al., 2013; Pascual et al., 2014). Although the Coasean approach of maximising efficiency and minimising transaction costs may not consider equity, others suggest that equity should be the core element of a PES scheme (Corbera et al., 2007; Loft et al., 2017; Pascual et al., 2010), in order to provide benefits to and engage the rural poor (McDermott et al., 2013). Meeting both equity and efficiency goals is feasible, if institutional factors, local interactions and power relations are considered in the design of schemes (Calvet-Mir et al., 2015; Pascual et al., 2010, 2014) that is 'fairly efficient and efficiently fair' (Leimona et al., 2015).

Fig. 1 illustrates the core components of equity. In considering equity in natural resource management (NRM), distributive outcome refers to the ability of different actors to enjoy environmental benefits and avoid environmental harm, while those managing the resources take on a fair share of the costs and management responsibilities and receive a fair share of benefits (He and Sikor, 2015). Participation in decision making is another aspect of equity that includes the rules governing the scheme and roles of stakeholders in decisions (Loft et al., 2017). The contextual equity refers to the social conditions of (in)equity, such as access to the decision-making process and distributions of benefits, and the capabilities and power to gain access (McDermott et al., 2013). These initial social conditions may affect the ability of stakeholders to participate in and benefit from a PES implementation. In this case, recognition of distinct identities, histories and community characteristics can support both PES effectiveness and equity

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