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How to achieve fairness in payments for ecosystem services? Insights from agrobiodiversity conservation auctions

Ulf Narloch[a,*], Unai Pascual[a,b,c], Adam G. Drucker[d]

[a] University of Cambridge, Department of Land Economy, 19 Silver Street, Cambridge CB3 9EP, UK
[b] Basque Centre for Climate Change (BC3), Alameda Urquijo, 48011 Bilbao, Spain
[c] IKERBASQUE, Basque Foundation for Science, Bizkaia Plaza, 48011 Bilbao, Spain
[d] Bioversity International, Via dei Tre Denari 472/a, 00057 Maccarese, Rome, Italy

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ABSTRACT

This paper provides insights into the multiple dimensions of fairness in payments for ecosystem services (PES) using the results of pilot agrobiodiversity conservation auctions. In two sites in the Bolivian and Peruvian Andes farming groups bid for payments for the conservation of traditional crop varieties. We assess different payment rules relating to how to allocate payments among groups subject to a fixed conservation budget. The discriminatory, uniform and conditional payment rules tested in these case studies incorporate alternative principles of fairness, while resulting in varying conservation and distributional outcomes. The latter are measured in terms of the distributional equality of payments among farmers and groups, and the distributional effects of payments on different types of groups. Findings indicate that conservation and distributional outcomes are highly sensitive to the payment rule chosen and vary across study sites. There may be contexts where cost-effectiveness does not need to be traded-off against fairness. Yet given the number of competing fairness considerations, achieving PES outcomes that are perceived as fair is very challenging.

Introduction

Payments for ecosystem services (PES) are an incentive-based instrument that can realign the private incentives for biodiversity conservation with those of wider society (Ferraro and Kiss, 2002; Wunder, 2006; Jack et al., 2010). Conservation outcomes depend on who receives payments for what (Wu et al., 2001; Rolfe and Windle, 2011). As land users tend to have varying conservation costs, there is an ongoing debate about how to maximize conservation outcomes given limited conservation budgets (Naidoo et al., 2007; Hajkowicz, 2009; Chen et al., 2010). The predominating consideration of cost-effectiveness in the PES literature (*e.g.*, Uchida et al., 2005; Sierra and Russman, 2006; Wünscher et al., 2008) is central to this debate

However, selecting only the least-cost suppliers of conservation services for payments may result in outcomes that are considered to be unfair, *e.g.*, when cost-effectiveness considerations allow a few, powerful land users to reap most of the payments (Kosoy et al., 2007; Börner et al., 2010; Jindal et al., 2013). Environmental policies are not just about how to reach efficient conservation outcomes but also have a social dimension, such as the distribution of benefits and costs, as well as issues related to environmental decision-making processes and participation (O'Neill and Spash, 2000; Wilson and Howarth, 2002). There is growing consensus that fair outcomes play a key role in determining the political and social legitimacy of PES on the ground and thus the longer-term success and sustainability of such programmes (Landell-Mills, 2002; Corbera et al., 2007a; Swallow et al., 2009; Corbera and Pascual, 2012; Muradian et al., 2013).

Often fairness in the PES literature is associated with pro-poor impacts (Jack et al., 2010; Milder et al., 2010; van Noordwijk and Leimona, 2010).[1] This is understood as either the extent to which the poor have access to (Zbinden and Lee, 2005; Pagiola et al., 2010; Jindal et al., 2013) or can benefit from a scheme (Pagiola et al., 2005; Zilberman et al., 2008; Leimona et al., 2009). A few authors go beyond poverty impacts by assessing the distribution of payments between different land users (see *e.g.*, Kosoy et al., 2007; Alix-Garcia et al., 2008; Börner et al., 2010; Sommerville et al., 2010). But generally, the empirical PES literature has been relatively silent on how payments should be allocated so as to be considered as fair.

* Corresponding author at: World Bank, Sustainable Development Network, 1818 H Street NW, Washington, DC 20433, USA. Tel.: +1 202 473 8939; fax: +1 202 522 7122.
E-mail addresses: ugn20@cantab.net (U. Narloch), unai.pascual@bc3research.org (U. Pascual), a.drucker@cgiar.org (A.G. Drucker).

[1] Often in the literature the term equity is used, which is interchangeable with fairness used in this paper.

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This paper builds on an emergent theoretical debate about fairness in the PES literature (*e.g.*, Pascual et al., 2010; Corbera and Pascual, 2012; Muradian et al., 2013). We assess conservation and distributional outcomes that could potentially be achieved under a number of payment rules related to how to allocate payments subject to a fixed conservation budget. These payment rules can be associated with different fairness principles. Distributional outcomes may be considered to comprise the distributional equality of payments among conservation service providers and the distributional effects of payments on different types of providers. Doing so, this paper contributes to the existing literature in two ways: (1) by providing empirical evidence about the interrelationships between cost-effectiveness and fairness in PES; and (2) by offering insights into the multiple dimensions of fairness that can be relevant in conservation payments.

We draw on data from pilot PES-like schemes for the conservation of crop genetic diversity implemented in two sites in the Bolivian and Peruvian Andes in 2010–2011 under the name of *Payments for agrobiodiversity conservation services* (PACS). Genetic diversity is being irreversibly lost from many agricultural landscapes across the globe due to farming systems becoming increasingly specialized in a limited number of crop species and varieties (Jackson et al., 2007; FAO, 2009). This is mainly due to a public goods problem, where wider benefits from many agrobiodiversity conservation services (such as the maintenance of evolutionary processes and associated global option values, the provision of supporting and regulating ecosystem services, the enhancement of agricultural knowledge and cultural traditions, as well as the maintenance of local seed exchange networks) are not captured in market values (Smale et al., 2004). More recently the potential of PES for sustaining the on-farm utilization of traditional crop varieties (landraces) which contribute to the maintenance of agrobiodiversity conservation services has been acknowledged (Narloch et al., 2011a).

Thus far, in agriculture most PES-like schemes resemble direct payments from public-sector organizations to farmers to maintain land for conservation purposes (FAO, 2007; Baylis et al., 2008). In the context of limited public budgets, reverse auction can be a means to allocate payments in a way that maximizes conservation outcomes. Farmers indicate the land area to be managed under certain conditions and the payment required to compensate their conservation costs. Due to the competitive bidding process, it is possible to identify those farmers that provide conservation services at least cost (Latacz-Lohmann and van der Hamsvoort, 1998; Ferraro, 2008; Jack et al., 2009).

Agrobiodiversity conservation auctions were implemented in the two study sites, with community-based farming groups bidding for in-kind payments for the conservation of traditional crop varieties during the 2011 production season. Here we present results from these auctions to explore multiple fairness aspects in the payment allocation. In the next section we discuss why fairness considerations are important in PES. 'Methods' section explains the study context and the different payment allocation rules, which are then analyzed in 'Results' section in terms of conservation and distributional outcomes. 'Discussion' section discusses the trade-offs between cost-effectiveness and fairness, as well as the multidimensionality of fairness in PES. 'Conclusion' section concludes by highlighting some of the challenges involved in designing efficient, fair and transparent PES.

Fairness considerations in PES

Why does fairness matter?

Although PES can be a means to achieve social ends (Pagiola et al., 2005; Milder et al., 2010; Greiner and Stanley, 2013), many experts claim that such incentive instruments for environmental protection should maintain their main emphasis on optimizing environmental outcomes (Pagiola et al., 2005; Wunder, 2007; Kinzig et al., 2011). Similarly, in a conservation auction it can be argued that allocating funds not only to the most competitive bidders but also in a manner that ensures fairness must to some extent undermine the main motivation behind using competitive tenders. Moreover, aligning cost-effectiveness with a number of fairness principles may raise the complexity and thus add to the transaction costs of a scheme. Yet there are important reasons why fairness considerations should not be disregarded in PES, even if these rely on an auction mechanism.

Firstly, the link between conservation actions and the provision of actual conservation services is often unclear, so that there remains uncertainty in cost-effectiveness assessments (Narloch et al., 2011b; Gibbons et al., 2011). In fact, conservation programmes generally lack specific outcome indicators (Kleijn and Sutherland, 2003; Hajkowicz, 2009), thereby undermining the case for disregarding fairness purely on cost-effectiveness grounds.

Secondly, cost-effectiveness can be undermined if a PES-like intervention is not fully embraced or even opposed by local resource users. In many rural communities the supply of public conservation services rely on fragile patterns of collective action built on social norms and preferences which shape fairness ideals at the community level (Narloch et al., 2012). Their provision can only be sustained if PES secure coordination and cooperation at larger scales (Prager et al., 2012). Accordingly, in social systems in which traditions and norms are built around fairness principles, these principles are relevant when applying PES incentives (Pascual et al., 2010). Furthermore, introducing economic incentives for conservation activities can have a detrimental impact on intrinsic motivations that underlie current conservation-related activities (Narloch et al., 2012). Therefore, when allocating payments, fairness considerations need to be taken on-board in order not to undermine existing pro-social norms.

Thirdly, PES interventions that lack wider local support or even face active resistance could increase implementation and thus transaction costs, thus reducing the cost-effectiveness of the schemes. For instance, in the case of repeated conservation auctions, any outcome that is considered as unfair might result in reduced participation rates in the future, thus leading to limited competition and hence reducing potential efficiency gains (as per Ferraro, 2008). While addressing fairness may make PES seemingly less economically efficient in the short term due to added costs, seeking fair outcomes can render PES more robust in the longer-term due to its higher social legitimacy (Corbera and Pascual, 2012).

Last but not least, PES schemes, which increase perceived inequity, may not only be considered as illegitimate, but may also result in social discord and local conflicts when resource users compete for limited conservation funds (Corbera et al., 2007a,b). This is especially likely to be so where social norms are shaped by egalitarian traditions and where concepts such as competitiveness and commoditization of natural resources are poorly understood or even rejected.

Which fairness considerations matter?

Fairness judgements can be shaped by a wide range of principles (Cook and Hegtvedt, 1983; Pascual et al., 2010; Schilizzi, 2011). How these are valued, interpreted and applied is mediated by complex local institutional structures (Konow, 2001; Schokkaert and Devooght, 2003; Faravelli, 2007). Given the co-existence of different fairness principles in people's perceptions (Konow, 2003; Frohlich et al., 2004; Cappelen et al., 2007), they may adjust the role of these principles over time according to situational factors