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Conservation tenders in low-income countries: Opportunities and challenges

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ABSTRACT

The number of payments for environmental service schemes (PES) in low-income countries has grown more rapidly than in high-income countries. Yet, scarce funding among potential service buyers in low-income countries arguably makes it even more important to design PES cost-effectively. Tendering conservation contracts is one possible way to improve the cost-effectiveness of PES schemes. There is reason to believe that they are particularly well-suited to overcome some typical constraints in low-income environments. However, experience with conservation tenders in low-income countries remains limited to a handful of scientifically motivated experimental trials. Larger roll-outs can so far only be found in high-income countries, mainly the US and Australia. How different would rolled-out PES tenders perform in low-income countries, and would they require distinct design features? Here, we identify specific opportunities and challenges for implementing conservation tenders in low-income countries. Conceptually, we examine each implementation step of a tendered PES for typical low-income country characteristics. Some may affect the design requirements for successful implementation, in either positive or negative ways, compared with the typical high-income country case. Imperfect markets and information about production systems, high subsistence incomes, high variability in prices and yields, and risk-averse behavior all constitute characteristics which conservation tenders may be particularly suited to address. Conversely, lack of expertise and infrastructure can hamper tender design and the dissemination of information to potential participants. Some of these challenges can be dealt with, but solutions unavoidably increase transaction costs which, in turn, may affect scalability. While tenders reduce poverty alleviation effects when informational rents of service providers are being squeezed, tendered PES programs do not reduce rents to zero under normal circumstances, and can therefore still deliver income transfers and contribute to poverty alleviation.

1. Introduction

Interest in payments for environmental services (PES) schemes has grown considerably in recent years (Pattanayak et al., 2010). Many programs are being implemented in low-income countries, although schemes in high-income countries often have been implemented at larger scales. For example, in a global review of payments for watershed services, Stanton et al. (2010) identified 216 programs, the large majority of which (71%) in Latin America, Africa and Asia (excluding China). The importance of designing PES in cost-effective ways may be particularly pronounced in low-income countries, due to the general scarcity of conservation funds and the resulting danger that PES could compete with governmental investments in the provision of basic public services (e.g. health, education). Also, many service buyers (e.g. of watershed services) are likely to be poor, and cannot afford a program with low budgetary cost-effectiveness, i.e. with high payments per unit of provided service (Schilizzi and Latacz-Lohmann, 2007) – henceforth abbreviated 'cost-effectiveness'.

Procurement auctions (or tenders) for conservation contracts are one possible way to increase the cost-effectiveness of PES schemes (Jack et al., 2009). Although conservation tenders may face some specific challenges in low-income countries, there is also reason to believe that they are particularly well-suited to overcome some typical constraints in low-income country environments, as we show in the remainder of this article. A major challenge for service buyers (e.g. conservation agencies or water users) is to estimate the true costs of service provision. Service providers (e.g. farmers and other land stewards) know more about the costs of generating ecosystem services than do service buyers (Ferraro 2008). The

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buyer's lack of information about provision costs can trigger high service provider rents, i.e. the difference between payment and actual costs (Wünscher et al., 2008). This is particularly the case in environments with high heterogeneity of provision costs. Heterogeneity is likely to be high in the context of low-income and dynamic middle-income countries, where the inequality in assets and technology, and thus productivity, is typically pronounced. The competitive environment of conservation tenders acts as an incentive for bidders to reduce rent seeking and submit bids that are closer to their true costs of service provision. Gains in cost-effectiveness through auctions with discriminative payments are difficult to quantify, because the benchmark values are usually not known (Latacz-Lohmann and Schilizzi, 2014), but experimental evidence suggests them to range from 10% to 60% in one-shot auctions (Schilizzi and Latacz-Lohmann, 2007).

Obviously, alternative pricing mechanisms to auctions potentially exist. But they encounter serious challenges even in optimizing uniform payments, particularly in low-income countries. Market imperfections and non-marketed (subsistence-oriented) economies in low-income countries reduce the ability to accurately estimate opportunity costs in alternative ways. Land markets, for example, are mostly incomplete and sometimes non-existent, and therefore cannot supply accurate information. The computing of opportunity costs using farm cash flows is complex and data-demanding, and therefore costly, just like in high-income countries. Adding to this, non-functioning labor markets make it difficult to assign appropriate values to the opportunity cost of family labor. And the absence of book-keeping in low-income countries may have farmers rely on shaky recalls of in- and outflows, with likely vested interests in answering strategically to cost questions. Cost-modeling approaches depend on accurate data for estimation, which due to the aforementioned challenges are rarely available in low-income countries. 'Screening contracts' require distinctive differences between farmers, and even if the latter are given, options to vary contract features and payment levels are limited. Optimizing uniform payment level by trial-and-error strategies could take many years, jeopardizing program costs and credibility. Conservation auctions are less exposed to the above limitations, and thus deserve a closer look.

In practice, however, the experience with conservation tenders in low-income countries remains limited to a handful of scientifically motivated trials. The earliest example is a uniform-price auction for soil conservation contracts in Indonesia (Jack et al., 2009; Ajayi et al., 2012, and Leimona and Carrasco, 2017). Jack (2010) later implemented a field experiment for the allocation of tree-planting contracts in Malawi, comparing the performance of a uniform-price conservation tender with a posted offer (see also Ajayi et al., 2012, Jack, 2013; Jack and Cardona Santos, 2017). A uniform-price auction was also applied in a field trial by Jindal et al. (2013) in Tanzania. In Peru and Bolivia, Narloch et al. (2011a) examined the effectiveness of tenders for agrobiodiversity conservation (see also Narloch et al., 2011b, 2012, 2013; Narloch et al., 2017). In Kenya, Khalumba et al. (2014) tested the cost-effectiveness of auctions for the allocation of tree-planting contracts relative to hiring labor at fixed daily wages. In the same country, Andeltova et al. (2014) applied conservation tenders to elicit information on landholder preferences for alternative conservation contracts. Practical field experience with tenders at larger scales and over longer time horizons has exclusively been gained in high-income countries, predominantly in the US and Australia, as reflected also in this issue.[1] For other natural resources, low-income countries have used auction mechanisms to allocate concession rights (fisheries, mining, timbers), but the few examples come mainly from higher middle-income countries, and alternative allocation mechanisms (such as grandfathering rights) remain the norm.[2]

This poses questions as to how different rolled-out PES tenders would perform in low-income countries, and how they should best be designed. Some plans have circulated to pilot auction designs in a pioneering PES program: Costa Rica's PSA (E.Sills, pers.comm., Sept. 2014), which gives our upfront questions some practical relevance.

Our objective here is to identify opportunities and challenges for conservation tenders specifically in low-income countries, so that they can be applied with greater realism. We also explore possible solutions to some of the identified challenges. We do so by outlining the standard implementation steps of a tendered PES and evaluating, step by step, the influence of some typical low-income country characteristics. Finally, poverty and equity implications from conservation tenders, a major concern to any low-income country, are discussed. Overall, we find that auctions can play a particularly beneficial role to reveal non-observable information in a data-poor and heterogeneous environment such as that of low-income countries. To the extent that organizational and logistical obstacles to auctions in low-income countries can be overcome, the potential pay-off in terms of cost-effectiveness gains may be high.

In the following Section 2 we present our conceptual framework. Section 3 discusses opportunities and challenges of conservation tenders by walking through their implementation steps under typical low-income country characteristics. We then discuss poverty issues in Section 4, and conclude in Section 5.

2. Conceptual framework

Conservation tenders are typically an integrated, but not indispensable design component of a PES scheme. We therefore distinguish between a standard PES without auctions, and a tendered PES with auctions. In our conceptual framework (Fig. 1), the non-shaded boxes denominate implementation steps that are identical for both standard and tendered PES.[3] The grey-colored boxes depict tender-specific implementation steps: i). auction design, ii). communication, iii). bidding process and logistics, and iv). bid formulation. For our analysis, we focus exclusively on the shaded boxes, and not on the challenges that apply to PES in general, such as insecure land tenure that could affect eligibility and enrollment (Wunder 2013). This would have to be addressed, for example, when the geographic scope and eligibility criteria are defined (third non-shaded box from top).

The figure also depicts a list of factors in which low-income countries typically differ from high-income countries, and which might impact the feasibility and performance of auctions. The list is motivated by characteristics that are commonly shaped by levels of gross domestic product (GDP), the most widely used indicator to distinguish between high-income and low-income countries, and by indicators used in alternative development measures, such as the Human Development Index, Better Life Index, or Social Progress Index. While we realize that a dichotomy of high- vs. low-income countries can be questioned, due to the highly heterogeneous distribution of countries along different development scales, we maintain the binary distinction for analytical purposes. Even within

[1] Rolfe et al. (2017) report on approximately 100 conservation tenders that have been run in Australia since the early 2000s. And the United States Department of Agriculture has been using auctions to retire land in the Conservation Reserve Program (CRP) since 1985. At its peak in 2007, 14.9 million hectares were enrolled in the CRP (Hellerstein, 2017).

[2] Further discussion on the issue of grandfathering versus auctioning can be found, for example, in Àlvarez and André, 2015; Clò, 2009; Goeree et al., 2010; Cramton and Kerr, 2002.

[3] The figure is not exhaustive on PES implementation steps and variations, but aims to illustrate how auctions are embedded in the implementation process.