Competitive Tenders for the Conservation of Local Plant and Animal Genetic Resources

This technical note outlines the arguments in favour of a local crop variety conservation tender approach and highlights potential research issues. The reason why such an approach is of interest is that *it might be expected that a tender/auction process for the conservation of local crop varieties can be implemented at lower cost than a grant mechanism* (standard fixed-rate payments). This would facilitate the maximisation of impact by permitting more to be conserved for any given conservation budget.

Competitive Tender/Auction Conceptual Background

Many crop varieties are at risk and conservation funding is scarce, implying the need for the definition of cost-effective diversity-maximising conservation programmes. Based on the Weitzman (1993) approach and following on from its adaptation by Simianer et al. (2003) and Reist-Marti (2003) to (animal) genetic resource issues, defining such a programme requires: (i) the definition of a diversity index for the varieties under consideration; ii) the definition of their risk status; and iii) an understanding of the costs (net of any production benefits) likely to be incurred in improving that status.

Within the context of the PACS project, the first two factors will be defined through the use of existing data and expert consultation led by the national partners. With regard to the third factor, actual (as opposed to hypothetical) genetic resource conservation costs have however never been used in a full Weitzman model. One reason for this is that determining costs under (iii) is far from straightforward, given the existence of significant non-market values related to genetic resource conservation and sustainable use, as well as the potential existence of heterogeneous production and opportunity costs, and information asymmetries (including hidden information[1] and hidden actions[2]).

Windle and Rolf (2008) note that production trade-offs mean that private values faced by landholders for biodiversity conservation are often lower than the associated public benefits, potentially resulting in sub-optimal levels of biodiversity protection (Rolf, 2002 cited in Windle and Rolf, 2008). A market failure problem exists when information is transmitted in markets about the productive use values but not of the non-use values of preserving biodiversity. A key policy issue is therefore how to adjust the incentives faced by landholders to ensure more socially optimal levels of biodiversity conservation.

Latacz-Lohmann and Van der Hamsvoort (1998) conclude that some institution other than a conventional target is needed to stimulate the provision of public goods[3] from agriculture. They argue that auctions are the main quasi-market institution used in other sectors of the economy to arrange the provision of public-type goods by private enterprises. Klimek et al. (2008) note that such opportunities provide farmers with the option of diversifying their total income risk by producing verifiable ecological goods instead of simply maximizing economic profit through high-input management practices. Windle and Rolf (2008) also draw on standard environmental economic theory to argue that the heterogeneity in landholder's opportunity cost revealed in the competitive tenders means a discriminatory price mechanism is likely to be more efficient at matching program costs with direct environmental benefits. This is also a result of the fact that, in contrast to fixed-price payments, an auction mechanism can explicitly consider the spatial heterogeneity of farm-specific costs and site conditions.

[1] Hidden information (adverse selection) issues arise when negotiating contracts. Landowners have better information than the conservation agent about the opportunity costs of supplying environmental services. Landowners can thus use their private information as a source of market power to extract information rents (Ferraro, 2008).

[2] Hidden action (moral hazard) arises after a contract has been negotiated. The conservation agent may find monitoring contract compliance costly and thus will be unwilling to verify compliance with certainty. Thus the landowner has an incentive to avoid fulfilling his/her contractual responsibilities (Ferraro, 1998).

[3] In addition to the conservation of the genetic resource base and future option and bequest values, Latacz-Lohmann and Hodge (2003) note the importance of society's preferences for supporting a multifunctional agriculture fulfilling the social functions of maintaining the cultural landscape, providing amenity goods, sustaining rural communities and safeguarding rural environmental capital.

Bioversity International
Via dei Tre Denari 472a
00057 Maccarese
Rome, Italy
Contact: Adam Drucker
a.drucker@cgiar.org

Project "Payments for Agrobiodiversity Conservation Services (PACS)"

Technical Note 2

Regulatory instrument comparison

Governments have four broad tools available to achieve on-farm biodiversity conservation. These are: i) education and suasion (can be an important first stage but in the absence of economic incentives does not necessarily translate into changed production practices); ii) regulation (farmers may focus on compliance at the expense of searching for better and less costly solutions); iii) direct grants and iv) market-based instruments (Young and Gunningham, 1997 cited in Rolfe and Windle, 2008).

A grant mechanism typically involves a standard fixed rate payment for achievement of a set of pre-determined actions (Latacz-Lohmann and Schilizzi, 2005 cited in Schilizzi and Latacz-Lohmann, 2007). Given that farmers have little knowledge about the public values for biodiversity conservation, while governments and community groups have incomplete knowledge about farmer costs incurred through conservation activities, one consequence is that grant schemes tend to be designed with incomplete information about both the public benefits and the private costs of conservation actions. They may also suffer from adverse selection, where farmers already generating environmental outcomes are most likely to be the ones who can take up grants at minimal cost (Schilizzi and Latacz-Lohmann, 2007; Latacz-Lohmann and Van der Hamsvoort, 1998). This means that grants processes may not be very effective at matching program costs with the desired benefits.

By contrast, market-based mechanisms involve the use of competitive behaviour and market signals in the provision of environmental services. Market mechanisms can be price-based, quantity-based or seek to reduce market friction (e.g. by providing more information, such as through labelling). Market-based mechanisms include traditional mechanisms such as charges and subsidies, as well as conservation auctions and competitive tenders (i.e. where a single-round auction process is used). With respect to the latter, tendered proposals are assessed to identify the net environmental benefits that would be generated, ranked in terms of their cost-effectiveness, and then the most cost-effective proposals funded to the level of budget available. Examples of competitive conservation auctions (all for non-agrobiodiversity-related conservation) include the US Conservation Reserve Programme, the US Environmental Quality Incentive Program, the Australian BushTender and EcoTender trials, as well as various European pilot projects such as the UK Countryside Stewardship Scheme and the Environmentally Sensitive Areas Scheme (Stoneham et al., 2003; Schilizzi and Latacz-Lohmann, U, 2007)

The market-like process generated in a competitive tender addresses the issue of asymmetric information. The tender process provides a framework where the purchaser identifies the outcomes that are required and the supplier identifies the cost of providing these outcomes, thereby allowing cost and benefit information to be revealed by the parties with the best knowledge. The process also helps address adverse selection issues as since in a discriminatory price auction farmers are paid their asking-bid level, the process matches the scale of the benefits with the opportunity costs incurred much more closely than is possible with a grant mechanism. The competitive process limits the scope for rent-seeking behaviour and helps to ensure that environmental benefits are generated at lowest cost (Latacz-Lohmann and Van der Hamsvoort, 1998). Furthermore, tenders focus on actual outcomes, while grants tend to focus on the funding and use of specific inputs (which may or may not achieve a specific desired outcome). Under a tender, farmer incentives are also created to find more efficient ways of generating the required outcomes, as well as permitting increased flexibility to innovate new solutions, making tender mechanisms more adaptable to changed conditions (e.g. from climate change or changing priorities as a result of continuing genetic erosion).

Important research questions exist in applying the tender model to agrobiodiversity conservation. Firstly, the importance of the efficiency gains from competitive tenders are, in general, poorly understood. Furthermore there are generic concerns about the extent of associated transaction, transformation, administration and compliance costs[4]. Failures can also occur if the auction process or contracts are poorly designed, if the market is too thin to generate real competition, if there is little variation in opportunity costs across participants, or if structural issues can generate inappropriate use of market power.

Competitive Tender/Auction Design and Application

A local crop variety tender design would draw on standard environmental service competitive tender approaches. In the latter, landholders are invited (and provided with support) to submit proposals that outline areas of their properties which they are prepared to manage to a specified minimum standard. Standards are set (by the conservation agent) at a level that will ensure the biodiversity values of the area will be protected. Landholders have the flexibility to manage the area as they wish as long as the standards are maintained. The bid proposal also includes a price/reward (monetary or non-monetary[5]) which is the payment required from the conservation agent to motivate landholders to enter into a management agreement and represents the opportunity cost of the management practices. All bids are assessed on the biodiversity values of the bid area and the bid price, selecting the most cost-effective bids for funding[6].

Auction design issues to be taken into account include (Windle and Rolfe, 2008): the number of rounds of bidding and the frequency

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[4] Post-tender assessments of differences between successful and unsuccessful bidders can be used to determine whether the competitive process generates significant indirect costs of this type (Windle and Rolfe, 2008).

[5] **Potential reward mechanisms** could include, *inter alia*: seed fairs, training on different species, "custodianship" recognition, infrastructure development, school meal programs (as a type of market as well), extension advice and seed access. Increased market prices (valuation addition), direct payments, landrace subsidies and national funds for on-farm conservation could all provide additional incentive mechanisms. **Types of rewards** may be designed so as to reinforce incentives for not switching to other varieties at a later stage (e.g. market chain development) and promoting sustainable use as a means of conservation. **Reward payment schedules** would have be designed in such a way as to ensure that some proportion of payments are only made upon completion of the conservation "contract". Finally, as many of the potential monetary and non-monetary reward mechanisms would function best at a community level, together with the desired objective of maintaining cultural landscapes and indigenous knowledge, leads us to hypothesize that tender bids and contracts would be focused at a **community-level** rather than a farmer level.

[6] Absolute conservation programme costs can also be minimized by focusing on communities where *de facto* conservation (through sustainable use) is still taking place, thereby ensuring that any opportunity costs incurred *per se* are likely to be low or even zero.

with which auctions are repeated, whether to have sealed or open bids, whether to use discriminatory or uniform pricing, the level at which the reserve price is to be set, and issues related to promoting equity and participation (including permitting multiple bids from the same farmer). Generic criteria for metric design may include the aims of maximizing the use of desk-top analysis, field site assessment being kept to a minimum to reduce potential differences between site assessors, eliminating the need for bids to be assessed by an expert panel, being transparent and easy to understand, and being easy to apply.

The sustainability of the approach will depend on the degree to which funding for tender implementation can be identified and the scale of non-monetary rewards (e.g. extension visits) that can be facilitated through existing funded programmes/rural development activities.

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