

# **Unraveling the effects of payments for ecosystem services on intrinsic motivations for collective action**

*Special session 7.18:  
Interrogating Payments for Ecosystem Services on  
Intrinsic Motivations for Conservation*

## **Abstract**

Payment for Ecosystem Services (PES) schemes have been implemented across a wide range of contexts and countries (Wunder et al. 2008, Landell-Mills and Porras 2002, Ferraro and Kiss 2002, Kinzig et al. 2011). A large body of evidence has consequently developed around issues related to the design of effective PES schemes, including in the context of the management of common pool resources and with regard to the reward systems used (for example, see Pattanayak et al. 2010, Wunder et al. 2008, Engel et al. 2008, Wunder 2007, Wunder 2005, Tacconi 2011, Kinzig et al 2011, Travers et al. 2011, Narloch et al. 2012).

In assessing PES effectiveness, it is necessary to account for contexts where individuals cooperate voluntarily or engage in collective action (Ostrom 1990). Such pro-social behavior affects the baseline against which PES schemes may be judged. Altruism, inequity aversion, reciprocity and other intrinsic motivations (i.e. personal motivations that pre-exist external incentives) can affect behavior, as do social ties and social interaction. Such ties have been found to increase cooperation, in particular in public good games (Peters et al. 2004, Haan et al. 2006). Communication has also been shown to be capable of supporting collective action in common pool resource and public goods problems (for example, see: Ostrom et al. 1994, Ledyard 1995, and Ostrom 2000). As with intrinsic motivations, social interaction can also impact upon the effectiveness of external interventions (Velez et al. 2006). Such impacts are not always positive. Under certain circumstances, external interventions have been shown to undermine intrinsic motivations and thus, potentially, do more harm than good (Deci 1971, Frey 1994, Frey et al. 1997, Ostman 1998, Frey and Jegen 2001). Yet, despite such findings, only a limited body of research has considered the potential interactions between reward systems and collective action (Vollan 2008, Velez et al. 2006, Narloch et al. 2012).

The main aim of this paper is to compare the effectiveness of collective (i.e. proportional to the group's contribution) and individual (i.e. proportional to the individual's contribution) PES systems to increase the public good provision of agricultural biodiversity conservation. Here we use the terms 'rewards' and 'PES' interchangeably as we refer to PES in a broad way (e.g., Muradian et al 2010) and thus do not dig into semantic discussions.

We build on Narloch et al (2012) to answer the following three questions: i) are collective and individual rewards equally effective in maintaining the environmental service in question?; ii) do the reward systems interact in similar ways with intrinsic motivations?; and iii) do communication and social ties affect the effectiveness of such reward systems? While Narloch et al (2012) assessed the effectiveness of individual

and collective rewards through their effect on intrinsic motivations, this paper adds to their findings by exploring a modified version of their reward systems, that is all rewards only materialize conditional on a conservation threshold being achieved by a group and by explicitly considering the effect of communication and social ties on effectiveness.

To answer the above questions, we conducted framed field experiments with farmers who carry out *de facto* conservation of agricultural biodiversity, in order to study collective action dynamics when rewards are introduced. As suggested by Smith (1994), experiments are particularly well-suited to study the impact of institutions on individuals' decision making processes. The game, as developed by Narloch et al. (2012), is an impure public goods game with a threshold effect framed around decisions these farmers are used to making in daily life. They are required to choose between growing a commercial variety of quinoa or a traditional one, knowing that the latter brings lower private market returns, but can generate public good benefits for the community subject to a minimum conservation level being reached

Results indicate that PES can be effective in motivating collective action. Additionally, individual rewards are likely to be superior to collective ones and less sensitive to the environment in which they are implemented. Both types of rewards have a smaller impact on farmers who are already unconditionally cooperative, indicating a crowding effect of external rewards on intrinsic motivations towards cooperation. We also find that collective rewards may have a stronger positive impact in contexts where communication and deliberation about collective action is possible. This suggests that researchers and practitioners focusing on PES ought to pay due attention to the potential indirect impacts of such incentives arising from their interaction with existing social systems and intrinsic motivations for environmental conservation.

### Summary

This paper addresses the differential impacts on decisions towards collective action of payments for ecosystem services where individual and collective rewards are conditional on a minimum collective conservation level being achieved. Interactions between the different reward types, farmers' social preferences and communication are identified. A field game experiment is conducted with Andean farmers in Peru and framed around their decisions to conserve agrobiodiversity. Results indicate that PES can be effective in motivating collective action. Additionally, individual rewards are likely to be superior to collective ones and less sensitive to the environment in which they are implemented. Both types of rewards have a smaller impact on farmers who are already unconditionally cooperative, indicating a crowding effect of external rewards on intrinsic motivations towards cooperation. We also find that collective rewards may have a stronger positive impact in contexts where communication and deliberation about collective action is possible.

**Keywords:** Collective action, Cooperation, Public goods, experimental field game, agricultural biodiversity, crowding effects.

**JEL:** Q57, C93, H23.