



# Economic vs non-material incentives for participation in an in-kind payments for ecosystem services program in Bolivia



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## ABSTRACT

This study examines the motivations that drive participation in a compensation program for environmental conservation in Bolivia. Previous research on payments programs suggests that institutions that appeal to both economic and non-material incentives should be encouraged. This program attempts such a strategy, offering in-kind compensation for conservation while simultaneously attempting to engage with environmental values and traditional social norms. I take advantage of a comprehensive household survey conducted prior to the offer of the program and employ means-comparison tests and multi-level regression analysis to compare those who chose to participate with those who did not. My research examines whether motivations for participating in this program reflected purely financial calculations regarding the costs and benefits of the program, or whether non-financial motivations such as environmental or social beliefs and norms played a role as well. I find evidence that the program's effort to engage with social motivations was successful and that social factors, not financial incentives alone, affect participation in the program. Findings also suggest that environmental values did not play a very large role, and that the financial determinants of participation are related mainly to prohibitive costs or barriers to entry, rather than the size of anticipated benefits.

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## 1. Introduction

Direct compensations for ecosystem services, often in the form of Payments for Ecosystem Services (PES), have been used across the world for over a decade to promote a variety of environmental behaviors (Landell-Mills and Porras, 2002). However, the motivations behind and institutional aspects of such incentive schemes remain understudied (Vatn, 2010; Muradian et al., 2010), and recently there has been renewed interest in the factors that influence participation in such schemes (Bremer et al., 2014). Understanding the different motivations that drive people to participate in conservation programs can help make those programs more successful and is also of interest to the many scholars who study the effects of such programs on pre-existing motivations.

Previous studies on motivations to participate in PES programs have either focused exclusively on material factors or have relied on qualitative data collected after the decision to participate has already been made. In this study, I use a distinct approach, first, by taking into account both material and non-material motivations for participation. Second, I make use of a comprehensive household survey conducted prior to the decision to participate, thus mitigating the risk of survey bias. Finally, I

look at the decision to participate in the context of a PES program that made explicit attempts to engage with non-financial motivations for conservation, by using in-kind rather than monetary compensation and by framing the program with respect to pre-existing social norms about reciprocity.

In reviewing the previous literature on factors affecting participation, I identify several broad categories of motivations (financial, environmental and social) that have been used to explain the decision to participate (or opt out of) such compensation programs, and discuss useful subcategories of each to guide my later analysis. I then identify questions in the household survey that relate to each of those categories. I first compare means of participants and non-participants on each category of factors affecting participation, using standard bivariate logit models to test for significance. Finally, I run a series of multi-level mixed effects logit models combining the different categories of motivations to arrive at a best-fit model that demonstrates which variables are robust to the inclusion of others.

My findings suggest that material factors play a large role in determining participation, in part by creating barriers to entry that limit the participation of certain households. I find no convincing evidence that environmental beliefs motivate participation in the program, but my results do suggest that the program's efforts to engage with social norms of reciprocity and cooperation was successful. I conclude that social embeddedness, in addition to material factors, helps motivate participation in the program.

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## 2. Literature on Payments for Ecosystem Services Programs

### 2.1. Rationale for a Socially-oriented PES

Increasingly, scholars suggest that PES programs are not comprised purely of market-based incentives, but rather must be viewed as institutions with significant social dimensions. Conceptualizing such incentives from a strictly rational choice perspective is subject to “commodity fetishism,” which obscures the social interactions that underscore economic transactions (Kosoy & Corbera, 2010). Compensation systems do not stand alone, but rather require interplay with multiple existing social and political institutions (Corbera et al., 2009). A more practical conceptualization of these incentives would take into account power structures and social embeddedness (Muradian et al., 2010).

Bolstering this notion that PES programs are more than the sum of their financial incentives is a long-standing body of literature demonstrating that people do not always respond to incentives in the ways that rational choice theory would predict, and that pre-existing, non-material motivations can actually be reduced by the introduction of monetary incentives (Titmuss, 1971; Frey, 1994; Deci et al., 1999; Gneezy and Rustichini, 2000; Bowles, 2008). In the context of conservation programs specifically, several studies provide evidence for such adverse effects of financial incentives (Cardenas et al., 2000; Jack, 2009; Velez et al., 2010; Kerr et al., 2012; García-Amado et al., 2013; Agrawal et al., 2015). In a review of 18 empirical studies on crowding effects of economic incentives for conservation, Rode et al. (2014) lament that more concrete evidence is inhibited by a lack of baseline information about pre-existing motivations “prior to policy intervention”. They conclude that there is some evidence of crowding out of non-material motivations by the introduction of economic incentives, but that crowding in may also occur, with results varying widely depending on the particular institutional design and wider social context under consideration (Rode et al., 2014).

In addition to influencing preferences by establishing incentives, institutions can also serve the role of signaling to individuals the mind-set that is most applicable in a given circumstance (Vatn, 2005, 2009). When monetary compensation is made salient, it invokes norms associated with market conditions, such as purely self-interested behavior, while the use of in-kind compensation can potentially avoid this (Heyman and Ariely, 2004; Kerr et al., 2014). Even the framing of programs as “compensations” rather than payments or incentives can influence their success (Wunder and Vargas, 2005; Vatn, 2010). Independent of intentional framing by policy-makers, perceptions of compensations can be influenced by interactions with pre-existing norms, identities and beliefs (Cárdenas and Ostrom, 2004; Cardenas, 2011; Velez and Lopez, 2013). One study concluded that “PES should not be viewed as a market panacea transcending the local institutional context, but rather as a potentially complementary instrument within a broader rearrangement of environmental governance” (Van Hecken et al., 2012).

Cranford and Mourato (2011) observe that, ironically, suggested improvements on PES in the literature, such as the use of in-kind compensations and a focus on cooperation and reciprocity (Farley and Costanza, 2010; Fisher et al., 2010; Muradian et al., 2010; van Noordwijk and Leimona, 2010), reflect a return to elements of the community conservation schemes over which PES was originally meant to be an improvement. After reviewing the pros and cons of each, they propose a two-stage approach that begins by creating a supportive institutional environment for conservation norms and then introduces more explicit financial incentives (Cranford and Mourato, 2011). Other scholars also propose hybrid approaches as a potential solution (Wunder, 2006; García-Amado et al., 2013).

Fundación Natura Bolivia, an NGO working in the lowlands of Bolivia, has implemented such a hybrid approach to incentive-based environmental conservation. Its *Acuerdos Recíprocos por el Agua*

(Reciprocal Watershed Agreements, or RWA) program takes advantage of long-standing community norms regarding reciprocity and introduces a system of in-kind compensations for forest conservation and watershed protection. This study seeks to examine whether motivations for participating in this program reflect purely material factors, such as the size of anticipated economic incentives, or whether the effort to engage with non-material motivations was successful.

Given the emphasis of previous literature on both institutional design and social context, this more socially-oriented approach to PES may be expected to have different outcomes than more traditional PES programs reviewed in previous literature. However, in order to provide some context for this analysis, the next section reviews prior literature about the decision to participate in PES programs.

### 2.2. Determinants of Participation in PES Programs

Previous findings regarding the determinants of participation in PES can be grouped according to either material factors or non-material motivations for participation. Material factors, i.e. those suggested by rational choice theories of human behavior, may relate not only to the expected size of the economic incentive, but also to “factors affecting ability and eligibility to enroll” (Bremer et al., 2014), or what I will refer to as “barriers to entry”. Non-material motivations can be classified as either pro-nature, referring to value placed on the environment, or pro-social, relating to relationships with other people and encompassing social norms, reciprocal obligations or altruism (Rode et al., 2014).

An econometric study meant to disentangle various determinants of participation in Costa Rica's PES program found that there were three major influences: land size, household economic and demographic factors and access to information (Zbinden and Lee, 2005). Others have also observed that participants in compensation programs tend to be larger landowners (Grieg-Gran et al., 2005; Kollmair and Rasul, 2010), either because those with smaller properties find it difficult to meet the requirements (and thus face a barrier to entry) or because the incentive payments (and therefore the size of financial motivation) are lower for small landowners and therefore less attractive to them (Miranda et al., 2003; Pagiola et al., 2005; Bremer et al., 2014). Incentive programs typically require formal property title (another barrier to entry), which may also result in a skew toward wealthier and more educated participants (Landell-Mills and Porras, 2002; Wunder, 2008), potentially increasing economic inequality (García-Amado et al., 2011). A fear of land expropriation or a more general distrust of institutions is another factor that seems to influence the decision to participate in such programs (Miranda et al., 2003; Southgate and Wunder, 2009), because it affects beliefs about the expected size of the economic incentive.

Taken together, these material factors affecting participation all relate either to barriers to entry or to financial motivations, though in some cases a single variable could be related to both, as in the case of land size. Factors relating to financial motivations include anything that directly affects the expected economic value of participating in the payment scheme. That includes the size of compensation, the direct costs of compliance with requirements, and beliefs about the likelihood that promised compensation will actually be delivered. Barriers to entry are factors that may prohibit someone from participating, even if they are motivated to do so. For example, a lack of land title would make one ineligible for the program, a lack of awareness of the program would make it impossible to sign up, and a lack of wealth could mean that one has no access to alternative resources, making it impossible to comply with the conservation requirements.

More recently, there has been an increased focus on non-material motivations for participation, mostly related to environmental attitudes or beliefs. In Mexico, researchers found that perspectives on the values and impact of forest conservation were critical drivers of participation in PES programs (Kosoy et al., 2008). A study in Ecuador found that motivations for enrolling in that nation's SocioPáramo program included, in addition to access to alternative sources of income and low opportunity

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