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Analysis

Payments for ecosystem services and landowner interest: Informing program design trade-offs in Western Panama

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ABSTRACT

Experience with payments for ecosystem services (PES) highlights the effects of program design on landowner participation, impacting the program's ability to achieve environmental and, where applicable, social objectives. We conducted an exploratory study in western Panama at the initial stage of PES consideration to identify potential landowner interest in PES and factors that would affect landowner interest and eligibility. We report the results from a household survey of 344 farmers and ranchers (92% response rate). Eighty percent of the respondents expressed interest in PES participation. Respondents' stated interest was significantly related to farm size, income, age, land tenure, and previous involvement in conservation. We also found that alternative specifications for landowner eligibility requirements, targeting criteria, and other parameters could greatly affect landowners' ability to participate, most strongly for respondents lower in socioeconomic status. We provide a framework for exploring potential landowner interest in PES at the very first stage of program exploration, from which program design can be strategically advanced with realistic PES scenarios to explore efficient payment levels and projected environmental benefits. Our findings highlight the importance of making explicit trade-offs that result from alternative PES design choices in affecting landowners' interest and eligibility to participate.

1. Introduction

Payment for ecosystem services (PES) is an institutional mechanism being deployed globally to internalize the economic value of ecosystem services into societal decisions (Tacconi, 2012). PES is generally considered first and foremost a tool to achieve environmental objectives. In practice, however, many programs in developed and developing countries incorporate implicit or explicit social objectives related to livelihoods, poverty alleviation, and/or rural development (Li et al., 2011; Turpie et al., 2008). Including social objectives generally leads to efficiency loss in achieving environmental objectives given budget limitations, yet this trade-off may be acceptable to policymakers and add to long-term program viability (Milder et al., 2010; Muñoz-Piña et al., 2008). For example, national-scale government programs in China, Mexico, Ecuador, and Vietnam (among others) have mechanisms in place specifically targeting the poor (de Koning et al., 2011; Wunder, 2008).

To achieve its objectives, PES needs to effectively engage supply and demand-side participants, and generally also intermediaries who facilitate program administration and transactions. The supply-side relates to participation by landowners and land managers, often agricultural producers. In designing a PES program to enable supply-side participation (once environmental and social, where applicable, objectives are defined), decision-makers must make choices about program structural factors such as landowner eligibility requirements (e.g., minimum enrolled parcel size), land targeting criteria (e.g., steeply-sloped lands), and payment levels. These specifications in turn expand or limit the potential pool of interested landowners who are actually able to participate. A particular area of focus for research has been on how program structure affects landowners' ability to participate at different socioeconomic levels, with special concern for adverse impacts on the poor. This has led to discussion of pro-poor PES programs that also address poverty concerns (Milder et al., 2010). For example, Pagiola et al. (2005) describe these programs as ones that maximize their potential positive impacts and minimize their potential negative impacts on the poor by (1) keeping transaction costs low, (2) providing targeted assistance to encourage participation, (3) avoiding implementation of programs in areas with conflicts over land tenure ((land rights, ownership, and/or possession of a title to the land), (4) providing access to credit if needed, and (5) ensuring the social context is well understood. If PES programs do not have eligibility guidelines designed with the

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poorest households in mind, then payments to those who are eligible could exacerbate social inequalities (Milder et al., 2010; Wunder, 2008). Indeed, experience to-date demonstrates that PES impacts on poverty prevention, alleviation, livelihoods, and landowner participation more broadly, depend upon site-specific characteristics and program structure, highlighting the need to consider these supply-side factors at the program design stage (Engel et al., 2008; Pagiola et al., 2005).

Recognizing this need, we worked with stakeholders in western Panama to collect information to guide the initial stage of regional PES exploration. At the time of this study Panama has not implemented a national PES program, yet PES development is being explored at regional and national scales (Lichtenfeld, 2007). Our objective was to conduct an exploratory study to gather information about the supply-side of a PES program in western Panama that would help decision-makers understand how landowner characteristics and program structure would affect landowners' interest and ability to participate in a future PES scheme. We chose this objective in collaboration with local stakeholders, who expressed that one of their first program exploration goals was to investigate PES supply-side factors.

To achieve our objective, we developed and applied a framework that addresses four questions: (1) Are landowners familiar with the PES approach? (2) Do landowners support PES development, and if yes, which type of program focus (e.g., forest conservation, reforestation, agroforestry) would be most attractive? (3) Which landowner characteristics affect stated interest to participate in a future PES program? And (4) how would decisions about specific program design elements (e.g., landowner eligibility criteria) affect the ability of landowners from different socioeconomic classes to participate in a PES scheme? By answering these questions through a detailed case study in western Panama, we aimed to inform PES development in the study region, as well as contribute to the broader knowledge base that policymakers globally can use to determine the appropriateness of, and guide the design of, PES as a tool to achieve environmental and social objectives.

2. Methods

2.1. Study Area

Our project was conducted in the Chiriquí province of western Panama, specifically in the buffer zone of La Amistad Bi-national UNESCO Biosphere Reserve and World Heritage Site (El Parque Internacional La Amistad; PILA). PILA is an important focus for conservation efforts in the region, as it contains one of the region's largest expanses of primary forest, with approximately one million hectares under protection harboring an estimated 4% of Earth's species (Clark et al., 2006). Agriculture is a major economic activity in this region, with products going to regional and national markets. The predominant crops include coffee, potatoes, plantains, and other vegetables. Most operations contain a mix of crops and livestock.

Conservation efforts in the region are threatened by challenges related to management of PILA (e.g., funding limitations, agricultural encroachment) and changes in the protected area buffer zone including agricultural intensification (e.g., increasing pesticide use) and landslides from farming on steeply-sloped lands (The Nature Conservancy, 2007). This once remote area is now in danger of losing its UNESCO Biosphere Reserve designation due to concerns over the impacts of these problems (UNESCO, 2008). Recognizing these challenges, government agencies and non-governmental organizations (NGOs) are investigating PES as a strategy for addressing these concerns.

We focused on two specific sites within the PILA buffer zone where PES is being considered: (1) the "Boquete site" encompassing the district of Boquete including the town of Alto Boquete and the surrounding countryside, and (2) the "Renacimiento site" encompassing the districts of Renacimiento and Bugaba including the town of Cerro Punta, the small neighboring community of Guadalupe, and communities along the road to the Costa Rican border (Fig. 1). The two sites are similar in their agricultural profile and conservation challenges. One difference is that the Boquete site has been experiencing an influx of expatriates and retirees, leading to rising land prices and pressure to sell agricultural lands to developers (The Nature Conservancy, 2007).

2.2. Community-Based Participatory Research

To develop a research program to assist local stakeholders, we used a community-based participatory research approach (Altman, 1995). We launched our project in May 2009 by facilitating a two-day collaborative workshop on ecosystem services in the town of Guadalupe (district of Bugaba, Panama). The workshop involved 21 participants from Panama and Costa Rica including protected area managers and other conservation practitioners, local farmers, and other stakeholders who all shared a common interest in effective management of PILA and the park's buffer zone. Information gathered through the workshop included a map showing qualitatively the supply and demand of ecosystem services for communities in the study region, a prioritized list of the most important ecosystem services produced in the region, and a list of opportunities and challenges for using PES to support farmers and conservation efforts in the region. This information was used to guide development of the PES survey described below.

Throughout the project, local partners served as "boundary-spanning" agents (Reid et al., 2009) helping to connect the researchers, local actors, and policymakers and to reduce concerns about distrust of extractive research. Our primary partner in the Boquete site was the non-profit Fundación Vida, Salud, Ambiente y Paz (FUNDAVISAP), which provides leadership in organizing local groups and the local government to have an active, participatory, proactive role in the land-use planning process. Our primary partner in the Renacimiento site was the non-profit Fundación para el Desarrollo Integral del Corregimiento de Cerro Punta (FUNDICCEP), whose main objective is to promote sustainable development for communities in the PILA buffer zone.

2.3. Sampling

Our study population consisted of landowners with farms or ranches in the two sites described above. We compiled a master producer list from multiple crop-specific lists provided by Panama's Ministry of Agricultural Development (Ministerio de Desarrollo Agropecuario de Panamá; MIDA), local farming cooperatives, and the Agricultural Development Bank (Banco de Desarrollo Agropecuario; BDA). The lists available were similar but not identical for the two study sites.

For the Boquete site, we obtained lists of onion and potato farmers from 2007 and 2009, coffee producers from 2009, and local coffee cooperative members from 2009. After removing duplicates, our combined list for this site included 747 farmers. For the Renacimiento site, we obtained lists of onion and potato farmers from 2007 and 2009, farms tested for coffee plant disease from 2008, and participants in MIDA farmer assistance programs from 2009. After removing duplicates, our combined list for this site included 910 farmers. According to local officials, our combined master list accounted for almost all farmers in our study sites. We randomly selected a representative sample of 500 producers from our master list, including 250 from each site. A total of 374 producers from this sample were successfully located across both sites. Producers are not required to register or update contact information, and some included on the original list had moved, passed away, or sold their farms.

2.4. Survey Design and Data Collection

A collaborative research team of academic, government, and NGO partners designed the survey instrument to gather information about landowners' potential interest and ability to participate in a regional PES program that could be developed in the future (Appendix A).