

# Evidence of Payments for Ecosystem Services as a mechanism for supporting biodiversity conservation and rural livelihoods



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## ABSTRACT

Payments for Ecosystem Services (PES) represent a mechanism for promoting sustainable management of ecosystem services, and can also be useful for supporting rural development. However, few studies have demonstrated quantitatively the benefits for biodiversity and rural communities resulting from PES. In this paper we review four initiatives in Guatemala, Cambodia, and Tanzania that were designed to support the conservation of biodiversity through the use of community-based PES. Each case study documents the utility of PES for conserving biodiversity and enhancing rural livelihoods and, from these examples, we distill general lessons learned about the use of PES for conserving biodiversity and supporting poverty reduction in rural areas of tropical, developing countries.

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## 1. Introduction

Payments for Ecosystem Services (PES) have become popular as a cost-effective and sustainable mechanism for natural resource management. Despite a dearth of empirical evidence, many researchers have speculated that the element of conditionality and the direct compensation modality of PES make this approach more effective than alternative conservation approaches such as Integrated Conservation and Development Projects (ICDPs), where the links between actions

and payments are often vague or non-existent (Ferraro and Simpson, 2002; MacKinnon and Wardojo, 2001; Simpson and Sedjo, 1996).

PES has been applied for ecosystem services associated with carbon, water, scenic beauty, and biodiversity. Of these, biodiversity has been the slowest to take off, largely due to the typically low availability of financial support for biodiversity conservation (Wunder and Kanounnikoff, 2009). While fewer biodiversity-based PES initiatives have been developed and/or documented, the role of PES as a conservation tool has received considerable attention in the literature (Pagiola et al., 2005; Redford and Adams, 2010; Sommerville et al., 2010; Wendland et al., 2010). However, more experimentation, in-depth evaluation and field testing are needed to generate guidance on when, where, and how to apply PES approaches for biodiversity conservation, particularly in countries with weak institutions, and unequal and ineffective application of the law (Pattanayak et al., 2010; Wunder and Kanounnikoff, 2009).

In addition to conserving or improving ecosystem services, the utility of PES for providing social benefits has also been explored widely in recent years. In high income nations, PES mechanisms primarily target the conservation or restoration of a key ecosystem service(s). In developing countries, PES also has been viewed as a potential mechanism for poverty reduction (Leimona and Lee, 2008;

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Pagiola et al., 2005; Pattanayak et al., 2010; Wendland et al., 2010). The utility of PES for supporting both conservation and poverty reduction is appealing in places where the two are often deemed incompatible and where PES may offer new and/or additional income generating opportunities for poor land-holders, farmers, or natural resource stewards who are isolated from markets and have few other livelihood options. However, despite a growing body of literature on the potential links between PES and poverty (Grieg-Gran et al., 2005; Kerr, 2002; Landell-Mills and Porras, 2002; Pagiola et al., 2005; Wunder et al., 2008), the quantitative, empirical data for assessing how PES can contribute to poverty reduction and under what conditions remain limited (Engel et al., 2008). Furthermore, many PES scholars and practitioners are concerned by the emphasis on PES as a poverty reduction tool, because it could lead to unrealistic expectations of what PES can do beyond conserving or restoring ecosystem services and, ultimately, could weaken the overall efficacy of the mechanism (Pagiola et al., 2005; Petheram and Campbell, 2010; Wunder, 2005).

In this paper, we address some of these issues and through case evidence, contribute to the growing body of knowledge on the utility of PES for supporting biodiversity conservation and contributing to poverty reduction in developing countries. Specifically, we address the following questions: how can biodiversity benefit from PES?; how can biodiversity-based PES support rural livelihoods?; and what are the necessary institutional factors for developing successful biodiversity-based PES in developing countries, where governance may be weak? To answer these questions we draw from user-financed, biodiversity-based PES initiatives in Latin America, Africa and Asia, and provide critical details on how the mechanisms were designed and implemented, and the results generated with respect to impacts on key ecosystem services and rural livelihoods. The case studies come from biodiversity rich landscapes that are home to impoverished rural communities that depend on the direct use of natural resources for their livelihoods. The cases include: community-based trophy hunting of turkeys in Guatemala; community land-use easements to conserve wildlife habitat in Tanzania; and community-based ecotourism and 'Wildlife Friendly' agricultural production in Cambodia. We consider these initiatives to be PES approaches because all of them involve a buyer making a voluntary, conditional payment to a seller, only if the key ecosystem service(s) of interest is conserved or enhanced by the seller through direct or indirect actions. In all of the cases presented, these conditional payments provide an incentive that enables and encourages the seller to engage in activities that help protect and maintain an ecosystem service, which is important to the buyer. These PES initiatives were selected for this analysis because of the data available with respect to their influence on conserving or enhancing key ecosystem services and generating benefits for local communities. Given there are few PES projects for which sufficient information is available to analyze effectiveness (Tallis et al., 2009), especially in developing countries, an analysis of these cases may provide useful guidance to other burgeoning PES schemes. While we realize that there is no single model for the successful implementation of a PES program or project (Kemkes et al., 2010), we conclude with a synthesis of lessons learned about the use of PES as a tool for supporting biodiversity conservation and benefitting poor, rural communities in tropical, developing countries with weak institutions and governance.

## 2. PES in the Maya Biosphere Reserve: community-based trophy hunting of the ocellated Turkey

### 2.1. Background

The wild turkey (*Meleagris gallopavo*) occurs across much of North America, where five regional subspecies are recognized (Aldrich, 1967). A century ago the species had been extirpated

throughout most of its range by overhunting and habitat loss and where they remained, most populations were severely reduced by unregulated subsistence hunting. Today this species is again abundant and increasing in many areas, and occupies a broader range in the United States and Canada than in pre-Columbian times. This recovery was due primarily to a transition from unregulated hunting to state-managed sport hunting in the United States, supported by science based wildlife management policies and improved regulatory capacity (Aldrich, 1967). These achievements were supported financially and politically by broad public participation in sport hunting.

The only other living turkey species is the ocellated turkey (*Meleagris ocellata*), which is endemic to the Yucatan Peninsula of Mexico and northern Central America (American Ornithologists' Union, 1998). This species is currently following the historic downward trajectory of its fellow congener. Overexploitation and habitat loss have led to its extirpation from much of its former range and where they persist most remaining populations are subject to destructive and uncontrolled subsistence hunting (Kampichler et al., 2010).

To address these threats to the ocellated turkey, the Wildlife Conservation Society, a wildlife researcher working in the area, and a wild turkey expert from North America worked together with local communities to develop a community-based ocellated turkey sport hunting enterprise in some of the community forestry concessions of the Maya Biosphere Reserve (MBR) in Guatemala (Fig. 1). The concessions and all wildlife are state owned, but the concessionaire communities have been granted extraction rights for all renewable resources for the duration of the concession period (25 years). The conservation concept is based on the premise that if local communities earn a significant proportion of commercial sport hunt proceeds by assuming responsibility for most field operations, this will provide a sufficient incentive to reduce unsustainable subsistence hunting practices and supports local forest conservation efforts. A niche market for ocellated turkey sport hunting exists among members, of the National Wild Turkey Federation (NWTf), a US-based NGO with over 350,000 members that promotes turkey conservation through sustainable use (National Wild Turkey Federation, 2010). Many NWTf members participate in an internal prestige system that recognizes hunters who successfully hunt and register specimens of the different wild turkey sub-species and the ocellated turkey (Baur et al., 2008).

The communities of Uaxactún (688 residents) and Carmelita (388 residents) where the community-based hunting enterprise known as *Project Pavo* operates are two of the largest and oldest permanent settlements within the MBR (Ramos et al., 2001). Previous research found that local turkey hunting by villagers was not extensive relative to other important species for meeting local dietary protein needs (Baur et al., 2008). This helped ensure that the opportunity costs of establishing an enterprise based on

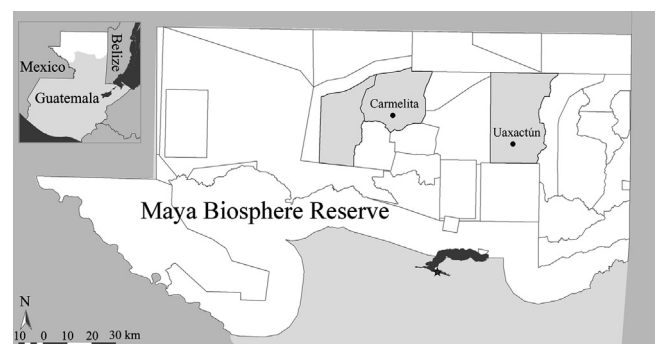


Fig. 1. Map of the Maya Biosphere Reserve in Guatemala showing the communities of Carmelita and Uaxactún and the three participating forest concessions in the Project Pavo.

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