

Payments for Water Ecosystem Services in Latin America: A literature review and conceptual model



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ABSTRACT

Latin America has been a pioneer in the implementation of payments for ecosystem services (PES) and numerous schemes are now in place. However, existing reviews of this experience are mostly theoretical and/or qualitative. This paper presents a comprehensive, systematic and up-to-date compilation and review of the literature on Payments for Water Ecosystem Services (PWS) in Latin America, in which 310 PWS transactions within 40 different schemes are analysed. Firstly, we quantitatively describe and discuss their key characteristics. Secondly, we identify information gaps that need to be filled to allow a more accurate analysis. Finally, we contrast PES theory versus the reported evidence. Results are discussed in the form of key messages and a conceptual model to support better design, implementation and monitoring is proposed. Among other things, our meta-study shows that there is a certain mismatch between how PES schemes are presented in theory and how they are actually practiced or reported in the literature. This mis-match concerns issues at the core of the PES principles, namely service-action conditionality, service definition and payment negotiation.

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1. Introduction

Payments for Ecosystem Services (PES) schemes are attracting ever increasing interest as mechanisms to improve conservation and achieve sustainable development outcomes. PES initiatives aim to reach mutually beneficial agreements between providers

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and users of ecosystem services, entailing a reward mechanism for ecosystem managers for maintaining or improving the provision of the services valued by beneficiaries. PES schemes are advocated in situations in which an environmental externality (e.g., deteriorated water quality due to deforestation) can be re-dressed through the creation of ad-hoc markets based on the Coasean postulate by which the social welfare optimum might be attained via bargaining (e.g., making payments to farmers in compensation for changed management practice, compensating for the opportunity costs of giving up forest harvesting). Engel et al. (2008) discuss a number of claimed benefits of PES schemes over other policy instruments for conservation. Compared to command-and-control measures, PES schemes are said to offer alternative livelihoods for local communities, to be more flexible, and to allow better targeting on areas/ecosystems with a higher value in terms of service provision. They are also said to be more efficient and more easily applicable than command-and-control measures in weak governance settings. But PES schemes are also receiving criticism, specially related to institutional and political economy issues (Muradian et al., 2010). Some authors have recently raised the concern that PES schemes could turn nature into a commodity and modify the way humans perceive and relate to it, which could be counterproductive for conservation purposes in the long run (Corbera and Pascual, 2012; Kosoy and Corbera, 2010; Ioris, 2010; Redford and Adams, 2009).

The growing policy interest in PES schemes goes hand in hand with increasing attention in the scientific and policy oriented literature. Fig. 1 presents the number of scientific publications on PES from 1993 to 2011, with exponential growth from 2004 onwards.

The increasing experience with PES in the field and the accompanying reporting in the literature provides an opportunity to deepen its understanding. A number of reviews and special issues have been dedicated to the topic. The journal *Ecological Economics* allocated a full special issue to PES in 2008 (2008, volume 65, issue 4), looking at new insights in design and implementation, and discussing these in the light of environmental economics. The same journal released another special issue in 2010, presenting this market instrument from different perspectives: from the more traditional environmental economics perspective to the ecological economics perspective (*Ecological Economics* 2010, volume 69). Other journals with special issues on PES are *World Development* (2005, volume 33(2)), *Environment and Development Economics* (2008, volume 13), *Journal of Sustainable Forestry* (2007, 28(3–5)), and more recently, *Environmental Conservation* (2011, volume 38). The Spanish journal *Revista de Estudios Agrosociales y Pesqueros* (2011, volume 28) also produced a special issue on the perspectives and challenges of PES. In this current issue in *Ecosystem Services* Schomers and

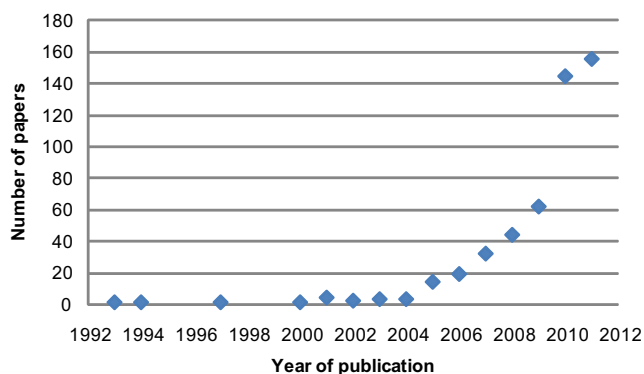


Fig. 1. Number of scientific papers using the terms “payment(s) for ecosystem service(s)”, or “payment(s) for environmental service(s)” (identified in a ScienceDirect search up to December 2011).

Matzdorf (2013) review and compare PES in developing and developed countries.

These reviews have analysed several dimensions of PES design and implementation, and represent a significant development in the understanding of these mechanisms. While valuable, most of these reviews are theoretical, qualitative and/or focus on a few specific aspects of PES schemes, such as their impact on poverty (Kosoy et al., 2007), deforestation (Daniels et al., 2010), or additionality (Pattanayak et al., 2010). One exception is Brouwer et al. (2011) who, through a meta-analysis, examine the environmental performance of 47 worldwide Payments for Water Services (PWS) schemes. Additional systematic review of multiple case-studies can contribute to this literature by identifying key messages across a range of existing PES. An in-depth and systematic regional analysis providing quantitative evidence is still lacking. We advocate the region (a group of neighbouring countries) as a relevant level of analysis as it allows gathering enough information to establish general patterns at the same time it ensures a certain degree of similarity in relation to bio-physical and socio-economic conditions. The present study aims to fill this gap by providing a meta-study of the practical experience with PWS in Latin America as reported in the literature. A review of 40 different PWS schemes was undertaken. To our knowledge, this represents the most comprehensive and up-to-date compilation of Latin American PWS schemes in the peer reviewed literature.¹

The objective of this article is threefold. First, we aim to deepen the understanding of existing PWS schemes by quantitatively identifying and discussing their key characteristics. Secondly, we aim at identifying the information gaps in the literature that need to be filled to allow a more accurate analysis of the existing evidence which could, in turn, support better design, implementation and monitoring. Finally, we aim to contrast PWS theory and reported evidence in order to contribute to the debate on the conceptualization of PES. This last objective requires some further introduction: the most cited definition of PES is the one by Wunder (2005), who defines it as: “(a) a voluntary transaction where (b) a well-defined environmental service (or a land use likely to secure that service) (c) is being ‘bought’ by a (minimum one) service buyer (d) from a (minimum one) service provider (e) if and only if the service provider secures service provision (conditionality)”. This definition has recently been criticised and a number of alternative definitions have been proposed; from definitions of PES-like schemes such as those which convey some but not all of Wunder (2005) defining principles—(Engel et al., 2008)—to broader definitions such as the one proposed by Porras et al. (2012) in which the voluntary nature of the transaction is restricted to scheme entry but not to price setting. Others go a step further, claiming the need for new theoretical frameworks in which PES should no longer be seen strictly as market transactions, but rather as mechanisms for incentivising the provisioning of services (Muradian et al., 2010). This paper aims at providing quantitative evidence feeding into this debate. The outcomes of the analysis are delivered in the form of key messages that are subsequently translated into a conceptual model of PWS.

There are several reasons for focusing on PWS in particular. First, water services are involved in the large majority of current PES schemes (Locatelli and Vignola, 2009). Second, the water cycle provides a good fit to what can be called an *ecosystem services approach* as emerged from the *Millennium Ecosystem Assessment (MA)* (2005), it forms a good context for expressing the effects of

¹ Landell-Mills and Porras (2002) compiled 18 cases in Latin America and the Caribbean; and Porras (2008) enlarged the analysis to 35 schemes. Camhi and Pagiola (2009) produced a World Bank Report with a compendium of programs in Latin America and the Caribbean, including a range of different services, but it does not include a systematic analysis such as the one presented here.

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