

Payments for environmental services and market-based instruments: next of kin or false friends?

Renaud Lapeyre, Romain Pirard (IDDRI)

A CONFUSED DEBATE ON MARKET-BASED INSTRUMENTS FOR ECOSYSTEM SERVICES

The emergence of market-based instruments (MBIs) in the field of ecosystem services has been spectacular but still lacks a clear conceptualization. Terms are overused and abused in discourses, and contrasted policy instruments are referred to as market-oriented albeit with few characteristics in common. Realities on the ground differ substantially from attractive yet misleading propositions supported by public and private discourses. Both advocates and opponents to these approaches thus propose arguments poorly relying on facts and fueling confusion. Payments for environmental services (PES) have flourished and constitute the emblematic and perfect example of a policy instrument that proves more complex and polymorphous than usually acknowledged. Born from the promises of spontaneous agreements between beneficiaries and providers of services for their mutual interest, it has been viewed by most analysts as a popular MBI. We challenge this view by confronting 73 peer-reviewed articles to a typology of MBIs.

PAYMENTS FOR ENVIRONMENTAL SERVICES: FROM ONE UNIFYING CONCEPT TO DIVERGING INSTITUTIONAL ARRANGEMENTS IN PRACTICE

Our analysis of the scientific literature allows us to assess what is a PES according to social scientists: on the one side a negotiated and private bilateral transaction between providers and beneficiaries of services according to the Coasean approach, but also on the other side the continued implementation of national-wide subsidy programs controlled by public authorities. Their institutional arrangements thus exhibit variety rather than a unifying overall model. Besides, scientific literature on PES lacks a more homogeneous and comparable set of research concepts, methodologies and evaluation criteria to inform policies.

TOWARDS A BETTER THEORETICAL CHARACTERIZATION OF PAYMENTS FOR ENVIRONMENTAL SERVICES

We argue that MBIs, including PES, as a term encompasses too large an ensemble of policy instruments. Rather, such diverse tools could usefully be split into either genuine market-based instruments with associated characteristics (commodification, market governance, fluidity of exchanges), or other types of policy instruments that exhibit features of monetary transactions (few agents with bilateral governance, usually designed to solve a specific problem). Most often a monetary transaction with poverty alleviation objectives, PES, we contend, clearly remain a bilateral relationship with very little or no feature of market governance or commodification.

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« *Mal nommer un objet, c'est ajouter au malheur de ce monde.* »
 Albert Camus, « Sur une philosophie de l'expression », in *Œuvres complètes*, Volume I, p.901-910, Gallimard, 2006

1. INTRODUCTION

The emergence of the concept of environmental services (ES)¹ in the 1990s with an exponential growth in the 2000s (Jeanneaux and Aznar 2010), is a significant trend in today's discourses and scientific literature devoted to biodiversity and environmental issues. This trend is associated with a perceived need to approach these issues from an economic and utilitarian perspective in order to improve society's consideration of its natural environment as reflected ultimately by appropriate policy-making. This supposedly pragmatic approach appears clearly in prominent reports such as the Millennium Ecosystem Assessment (MEA 2005) with its four ES categories, or more recently in *The Economics of Ecosystems and Biodiversity* (TEEB 2009). Seeing nature through the lens of ES enables economic valuations to be more easily performed as specific benefits can be identified and valued (e.g. Costanza *et al.*, 1997 as a milestone). This in turn is commonly assumed to facilitate decision-making: “we don't protect what we don't value” (Myers and Reichert 1997, p. 19), or the incantatory “working to make the forests worth more alive than dead” stated *inter alia* by the Prince's Rainforest Project. Yet such assumption is also challenged in the literature (Laurans *et al.*, 2013).

This utilitarian and allegedly pragmatic perspective has been accompanied by an enthusiasm

for market-based approaches, including Payments for Environmental Services (PES). The use of market-based instruments (MBIs) for managing ecosystem services is booming (Pattanayak 2010), and this trend might be explained by the perceived failure of other approaches qualified as coercive or command-and-control. The assumption is that reconciling economics and ecology may be a credible prospect with ecosystem services, and MBIs may be the vehicle to make it happen.

Yet, once examining the issue in more details it appears that the frontier between market-based and other types of policy instruments remains blurred. The term “markets” might be subject to contrasted understandings. For the sake of illustration, Wunder and Vargas (2005) remind us that the term “markets” has both positive and negative impacts for the adoption of instruments that, ironically, do not really deserve this name: “After all [environmental service markets] are seldom true markets” (p. 2). It is therefore necessary to undertake a clearer conceptualisation and framing of these instruments, if only to contribute to the currently polarized debate, given that “policy-makers' enthusiasm for market development [for ecosystem services] is not matched by practical understanding” (Landell-Mills and Porras 2002, p. 1).

Such a clarification exercise is critical for several reasons. First, theoretical confusion has led to lengthy discussions in international arenas, resulting in delayed implementation of policies. As stated at the dialogue seminar on ‘Scaling up Biodiversity Finance’ organised by the Secretariat of the CBD in Quito in 2012, “the issue of innovative financial mechanisms (IFMs) for biodiversity proved more difficult [at COP10 in Nagoya] and was dropped, allowing agreement on the other issues (...)” (Farooqui and Schultz 2012, p. 6). At the Rio+20 Conference, Presidents Evo Morales

1. In this article we mention ecosystem services or environmental services without making a distinction as far as policy instruments are concerned.

of Bolivia, Rafael Correa of Ecuador, and Jose Mujica of Uruguay denounced the new colonialism of nature commodification through market mechanisms. This could lead for instance to ideological fierce opposition by ALBA countries² to the development of Payments for Environmental Services (PES) commonly presented as novel and efficient instruments relying on markets.³ This is counterproductive and ironic, as most PES experiments have actually little to do with markets. Hence, “the terminology might be important for the further development of [lessons learnt on scaling-up finance for biodiversity]. [...] In any discussion of markets, it is important to be clear about what kind of market is being discussed” (Farooqui and Schultz 2012, p. 2-3). Our research contributes to reducing the side effects of such market rhetoric.

Second, dialogue and communication are at the basis of well-informed and appropriate policies. It is thus ineffective and even potentially damaging to lack agreed definitions and understandings as far as policy making is concerned. The unsettled rhetoric of markets could probably divert funds from efficient traditional programmes towards so-called novel (but not necessarily preferable) market approaches, including PES. Maintaining a certain level of illusion regarding the content, nature and scope of MBIs will do no good in the longer term to environmental management. And it might also generate backlash effects when many come to realise that in fact the rolling-back of the State with MBIs is largely a myth.

Third, we assume that this confusion is not only the result of an excitement around new instruments, but also quite a conscious movement in favour of some approaches that lost popularity. Mostly, it refers to these policy instruments that heavily involve State interventions, and taxes and subsidies are a perfect illustration. Promoting these with new names might enable their enhanced implementation: the PES program in Costa Rica, which is the emblematic example of the development of new market approaches to conservation, has been named a “subsidy in disguise” recently by Fletcher and Breiting (2012): “While the program [...] is commonly considered a paradigmatically neoliberal market-based conservation mechanism, its actual operation to date has deviated substantially from this description” (p. 402).

Yet, can such attempts to promote public policies with misleading terms and concepts globally improve policy making and the comparative evaluation of public policies that should prevail for optimal long term results?

On the occasion of a previous piece of work intended to discuss the treatment of MBIs in the peer-reviewed scientific literature, we observed that very little overlap exists with peer-reviewed articles devoted to PES specifically (Pirard and Lapeyre, forthcoming). This came as a surprise because it is common in discourses to have PES considered as market-based approaches for environmental management. For the sake of illustration, the prominent TEEB initiative suggests “creating markets for the conservation of biodiversity and ecosystem services, for instance through Payments for Ecosystem Services” (TEEB, 2009); the European Commission (2007) asks: “Should the Member States make a more intensive use of [MBIs]? [...] in particular, payments for ecosystem services” (EC 2007, p. 14); and a prominent book on forest environmental services presents PES as innovative market-based mechanisms (Pagiola et al 2002). In total it is still unclear how PES are related to concepts of MBI and markets.

Taking stock of this confusion, we aim to unveil this conceptual relationship as apprehended by social scientists. To do so we analyse PES through the lens of a typology of MBIs. Several attempts for conceptualization and classification of MBIs are provided in the literature (e.g. Jordan 2003; Mattheiß 2009). However these typologies tend to mostly build on inductive reasoning: they first consider already existing so-called market-based instruments, and their practical implementation, so as to later propose a typology. On the contrary, in the present article we will use the typology developed by Pirard (2012). Building on deductive reasoning rather, it presents six generic categories based on the very economic nature and role of “markets” for such a heterogeneous and diverse group as the one constituted by all presumed MBIs: direct markets, tradable permits, reverse auctions, Coasean-type agreements,⁴ regulatory price changes, and voluntary price signals (Table 1). As it ultimately focuses on the economic characteristics of categories of instruments such typology, we contend, provides better guidance for specifying the market nature of PES.

The methodology relies on a review of peer-reviewed scientific literature devoted to PES through

2. The Bolivarian Alliance for the Peoples of Our America, bringing together the countries of Latin America and the Caribbean led by socialist governments.

3. Negotiations on climate change in the framework of the UNFCCC (Climate Convention) have similarly, experienced great resistance from ALBA, which opposed any reference to carbon markets for the implementation of the REDD+ mechanism.

4. These agreements are bilateral and based on negotiation, as suggested by the economist Ronald Coase (1960). The assumption is that they lead to optimal outcomes whatever the initial allocation of rights among stakeholders, if transaction costs are minimal.

Table 1. The typology of MBIs used in the present article

Category	Exclusive characteristics	Specificities	Relation to markets	Examples of application
Direct markets	A market where an environmental product can be directly traded between producers and consumers (or processors)	Can be framed at the international level with specific rules for each country and a great variety of deals (genetic resources), or as a more classical market with more or less processed products (NTFP)	Proximity to the market definition depends on cases and the degree of commodification	Genetic resources, non-timber forest products (NTFP), eco-tourism
Tradable permits	An ad-hoc market where users of an environmental resource need to purchase “permits” that can be further exchanged among resource users, thereby creating artificial scarcity	Designed to either serve a clear environmental objective (with bio-physical indicators) or based on acceptable social costs (market price for carbon)	Creation of a specific market for a given environmental objective, information are expected to be revealed	Mitigation banking for biodiversity, emission quotas in the European ETS, Individual Transferable Quotas for fisheries, tradable development rights for land, voluntary carbon markets*
Reverse auctions	A mechanism whereby candidates to service provision set the level of payment (if accepted) in response to a call by public authorities to remunerate landholders	Aimed at revealing prices and avoiding free-riding and rent seeking	Creates an auction-based market that favors competition among bidders for achieving cost-efficiency	BushTender in Australia, Conservation Reserve Program in the US
Coasean-type agreements	Ideally spontaneous transactions (free of public intervention) for an exchange of rights in response to a common interest of the beneficiary and the provider	Requires clear allocation of property rights, highly site-specific and difficult to replicate on a large-scale	Usually not following market rules, more of a contractual nature	Direct payment schemes (e.g. Wunder 2005), conservation easements, conservation concessions
Regulatory price changes	Consists in regulatory measures that lead to higher or lower relative prices	Part of a fiscal policy (including subsidies) with environmental objectives and complete control by public authorities	Based on an existing market	Eco-tax, agro-environmental measures
Voluntary price signals	Consists in schemes whereby producers send a signal to consumers that environmental impacts are positive (in relative terms) and consequently gain a premium on the market price	Still limited as an incentive for action due to relatively low willingness to pay by consumers	Uses existing markets to identify and promote virtuous activities	Forest certification, labels for organic agriculture, norms (self-produced before certification)

* These voluntary carbon markets stand as an exception in this category, as they are of private initiative and are not derived from publicly-led commitments (contrary to individual transferable fishing quotas, greenhouse gas under the Kyoto Protocol, etc.).

Source: Pirard 2012.

the lens of the extensive typology of MBIs, and will be described in the next section. Results will be presented in section 3. We will discuss these results in section 4, with lessons regarding the true nature of PES, their conceptual relationship with MBIs, and their most discriminant characteristics, before concluding.

2. METHODOLOGY

In order to build a representative database of peer-reviewed scientific articles on PES—a direction that is arguably justified by the fact that the concept of PES comes from the scientific literature and is very much debated in this context—we used

the authoritative ‘Web of Science’ (WoS) website. As part of it, the ‘Social Sciences Citation Index’ (SSCI) is an interdisciplinary citation index. At the time the search was made (June 2012), this citation database was covering 2,474 of the world’s leading journals in social sciences across more than 50 disciplines.

We looked for all references that included “payment(s) for environmental services” OR “payment(s) for ecosystem services” in their title.⁵

5. This criterion was justified by the sufficient number of articles found to ensure representativeness of all views, and in order to avoid all articles including PES in the keywords for the sake of being identified, although this is not their core subject.

The WoS search engine found 74 results (excluding book reviews), out of which we could download and analyse 73 articles (99%), all deemed relevant. Though this corpus is not exhaustive (grey literature is excluded from WoS), the search still allows us to study a fair amount of scientific articles closely dealing with PES (indeed PES has to be in the title); hence it is our contention that this database is representative and the analysis done here remains unbiased.

When analysing these articles, we first classified the instruments according to the typology (see Table 1). We thereafter focused our attention on six salient points, which are in order of treatment: the research method applied by the authors, the alleged justification for such an instrument, the evaluation criterion on which an assessment is made if any (e.g. efficiency or equity), the positive or negative conclusions of this assessment, and finally the geographical area of concern and the ES discussed.

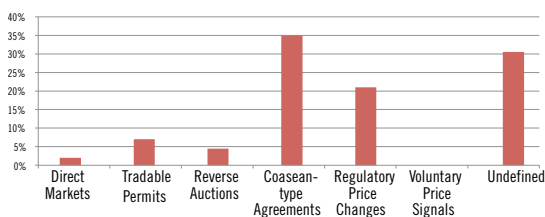
3. RESULTS

In order to position PES with respect to MBIs, we analyse our database in two ways: firstly through the lens of the typology, and secondly by reporting on how the schemes are studied in the literature and perceived by scientists.

3.1. Literature on PES and MBIs in light of the typology

We first attempted to distribute all instruments discussed in the PES literature database among the six categories of the typology (Figure 1).

Figure 1. Classification, as per the typology, of instruments called ‘PES’ in the literature



Source: Classification based on authors' database.

Schemes presented in the PES literature seem to suit specific categories of the typology. Based on our own assessment, they are mainly Coasean-type agreements (35%) and regulatory price changes (21%). This distribution tends to confirm the influence of previous conceptualisations of PES as an application of the Coase argument with contractual agreements between providers and

beneficiaries of ES (Wunder, 2005; Kosoy 2007; To 2012); nevertheless, PES analysed in the literature also extend their realm of implementation to more government-financed schemes as would be the Costa Rica emblematic case (Wünscher 2008; Pagiola, 2008). In addition, few articles in the database deal with ‘PES’ schemes related to commodity markets (categories of ‘tradable permits’ or ‘direct markets’, respectively 7% and 2%, see Naidoo 2011; Hedge & Bull, 2011) as well as competitive selection (category ‘reverse auctions’, about 5%, see Turpie 2008). On the contrary, none of the ‘PES’ schemes presented in the literature deal with eco-labelling and certification mechanisms. The last category ‘undefined’ includes one third of articles that remain general and do not focus on a specific instrument. In this latter case, we were not able to classify the schemes in any of the categories of the typology.

3.2. How are PES studied in the literature and perceived by scientists?

Analysing methods, approaches and conclusions in the literature further allows us to look at the specificities of PES in the realm of MBIs. This effort is also useful to shed light on the overall lessons to be drawn from research on these instruments, because the greater the variety of methods and entry points, the less relevant comparisons and thus general lessons for practitioners and decision-makers.

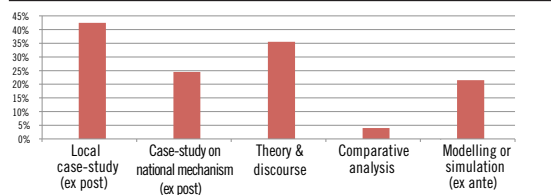
3.2.1. Methods applied in the literature

Though most PES articles (42%) focus on local issues and provide empirical data collected at household and community levels, mostly in order to assess ex-post impacts at the local level (Kosoy 2008; Pagiola, 2008, 2010), scientists also consider PES through a broad range of other lenses and analytical methods (Figure 2). More than a third (36%) mobilizes theoretical discourses without empirical data, exposing general arguments, both positive and negative in their conclusions (McAfee & Shapiro, 2010; Tacconi, 2012). Further, one quarter (25%) describe mechanisms designed at a larger scale (e.g. national as in Costa Rica, Mexico or China, see Corbera 2009; Gauvin 2010). In this case, the instrument tends to be analysed in an institutional and governance perspective, or with the comparison of several sites. Around one fifth of papers (22%) also apply ex-ante modelling and simulation that aim at predicting economic impacts on prices, market-entry, welfare and environmental results of the implementation of a range of instruments (Engel and Palmer, 2008),

occasionally testing these models against empirical data (Alix-Garcia 2008). Finally, few articles (4%) present comparative analysis of PES (Kosoy 2007; Wunder 2008).

Overall, although multidisciplinary research is essential, this review reveals that academic research methodology on PES proves quite scattered and heterogeneous. While it clearly remains important to address a variety of policy designs through various methodologies and to reflect views from a number of sciences, this diversity of research methods might impede comparisons and thus the capacity of policy makers to draw more robust lessons for replication with respect to the impacts, risks and opportunities of implementing PES.

Figure 2. Methodologies applied in the literature to analyze PES



Note: Each article can apply several methodological approaches at once, hence the total exceeding 100%.

3.2.2. Evaluation criteria and assessment in the literature: a lack of clear indications

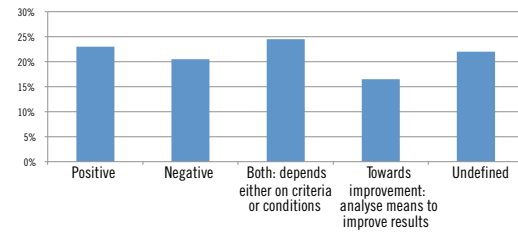
When assessing impacts of PES, the scientific literature also applies a heterogeneous range of evaluation criteria.

Not surprisingly, more than half of the articles (51%) assess instruments' environmental effectiveness (i.e.: has the environment eventually benefited?) (Sommerville 2010a; Scullion 2011) and 38% do focus on efficiency (or "cost-effectiveness", i.e. assessing environmental impacts against the costs of implementation) (Chen 2010; Pascual 2010). However, many other criteria are equally applied: contribution to poverty alleviation (38%, see Thuy 2008; McElwe, 2012), equity (21%, see Sommerville 2010b), as well as enrolment (participation) and adherence in the programmes (21%, see Pagiola 2010; Chen 2012) are studied in the PES literature. Further, issues of feasibility (8%), legitimacy (4%), sustainability (7%) and governance (4%) are also analysed, yet rarely.

As a result of this heterogeneity in evaluation criteria, but also in research methods (see section 3.2.1), no clear evidence of positive or negative trends emerges from the literature: scientific articles presenting positive, negative, and mixed results were found in almost similar proportions (20-25%) in our review (Figure 3). Furthermore,

more than one fifth of articles actually do not aim at evaluating environmental nor economic impacts.

Figure 3. Assessment of instruments in the literature



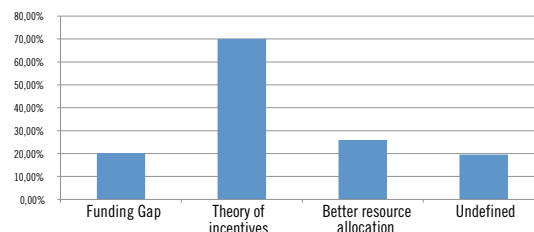
Note: Each article could be simultaneously coded as negative and 'towards improvement', hence the total exceeding 100%.

3.2.3. Justifications provided for the choice of instruments

Three main arguments are proposed in the literature to justify the use of PES against other policy instruments: provision of incentives, better resource allocation, and the capacity to address the funding gap for conservation (Figure 4).

First, a large majority of articles in the database (70%) mention the provision of economic incentives (Jack 2008; Muradian 2010). The theory of incentives indicates that agents receive price signals and make decisions accordingly. Decisions are not imposed through coercive or prescriptive means, e.g. through command and control, and agents have the opportunity to balance the costs and benefits of going one way or another. An optimum level is assumed to be easier to achieve due to the higher flexibility of incentives; in addition, incentives are considered more effective than coercion in inducing the right decisions by agents—especially in contexts with poor law enforcement. In other words, PES purportedly focus on achieving results through the self-interest of private entities.

Figure 4. Justification of mechanisms



Note: Each article could have several justifications simultaneously, hence the total exceeding 100%.

In second position, more than one fourth (26%) of academic papers in the literature argue that PES are likely to foster a better allocation of resources (Alix-Garcia 2008). Indeed, these instruments

purportedly allow buyers of ecosystem services to more efficiently find and choose providers with the greatest and most cost-effective contribution. Moreover, the market approach is temporally and spatially more flexible and allows biodiversity projects to periodically adapt and change their geographical location based on locally changing ecosystem services' values and opportunity costs to produce services.

Finally, 21% of articles designate PES as an innovative approach to tap into the willingness to pay by ES buyers and thus to potentially reduce the funding gap for biodiversity conservation (Corbera 2009; Pirard, 2012). This funding gap issue has long been identified as an issue, although the quantitative figures remain debated (Lopoukhine 2012; Feger and Pirard, 2011).

3.2.4. Geographical focus and environmental services discussed in the scientific literature

In line with its focus on poverty alleviation (see section 3.2.2), the literature on PES mainly addresses instruments implemented in developing and emerging countries: Latin America (44%), Asia (20%) and Africa (12%).

With 41% and 40% of all articles analysing PES schemes respectively for biodiversity conservation and hydrological services, the latter are the two ES of greatest scientific interest in the scientific literature.⁶ Further, climate mitigation services (27%) come third, while soil control (16%) and recreation (8%) are quite marginally analysed. Interestingly, one third (34%) of articles remain general and mention "ES" without any further specification.

4. DISCUSSION

4.1. PES: from Coasean agreements to subsidies in disguise?

A first lesson regards the meaning of PES within the MBIs' framework. According to this representative review of peer-reviewed scientific articles, analysed through the lens of one typology, PES stand as either Coasean-type agreements or regulatory price changes. They are therefore highly concentrated in two categories of instruments that could be connected to respectively user-financed (beneficiary negotiates) and government-financed

(public authorities as intermediaries decide of uniform payment levels to all providers). Although often viewed as an application of the Coase argument, many PES described in the literature actually lean towards regulatory price changes, e.g. subsidies to farmers to their change practices (20.9% of instruments discussed in the PES literature, see Figure 1). Admittedly, in a majority of cases it also proved difficult to make a choice between categories. This happened for instance in the cases of the Mexican (Corbera 2009; Garcia-Amado 2011), Costa-Rican (Pagiola, 2008; Fletcher and Breitling, 2012) and Chinese (Zhang 2008; Gauvin 2010) "state-funded PES programmes".

4.2. The multidimensionality of PES instruments

A second lesson regards the positioning of policy instruments within the categories of the typology. It is remarkable that some of the instruments described in the articles were not easily placed in one category and could end up in several categories at the same time (we did not make multiple choices though). Indeed, instruments presented in the literature have in real fact some characteristics that fit one category while other characteristics fit another category or more. It reflects the multidimensionality and complexity of policy instruments whether they are economic, regulatory, command-and-control, or else.

Let us give an example. All instruments described as auctions could also be associated to another category. Indeed, auction instruments are best characterized as a practical method to set a price for ES provision through the identification of the cheapest ES providers. As illustrated by the Bush Tender programme in Australia (Windle 2009) or the Conservation Reserve Programme in the USA (Wunder 2008; Laurans 2012) that both apply reverse auctions, the scheme can also actually be seen as a Coasean-type agreement with contractual payments or as a regulatory price change with subsidies. Consequently, it seems that the process to set payments (auctions) should be distinguished from the institutional arrangement to distribute these payments (national subsidy programme).

4.3. Market versus bilateral governance as a key distinction

A third lesson relates to the above-mentioned complexity and multi-dimensionality of policy instruments. It appears promising for the sake of clarification to oppose two contrasted conceptions of markets. We can build on Williamson (1979) to

6. We are aware that biodiversity is not an ES strictly-speaking, e.g. according to the Millennium Ecosystem Assessment, but we report here definitions and concepts used by authors of all articles in our corpus.

characterize MBIs and PES as governance structures, where governance is “an effort to craft order, thereby to mitigate conflict and realise mutual gains” (Williamson 2000, p. 599). Thereafter we differentiate PES and MBI arrangements in the field as market governance structures and bilateral governance structures. The former is “the classic nonspecific governance structure within which faceless buyers and sellers meet for an instant to exchange standardized goods at equilibrium prices.” (Williamson 1979, p. 247-248); here the medium in the exchange remains the sale rather than the contract⁷ and the identity of parties is almost of negligible importance. At the opposite, bilateral governance applies to transactions with rather specific, non-transferable investments in physical and human assets. In this case, the non-standard and ill-defined nature of the good and service concerned makes market governance hazardous and recurrent transactions justify the costs of additional governance mechanisms (more complex contracts with direct and recurrent payments).⁸ Back to our environmental scope, these insights resonate well with the proposition by Corbera (2007) and Vatn (2010) to distinguish between markets for ES (MES) and payments for ES (PES). Muradian and Rival (2012) make a similar point when they plead for a distinction between rewards, incentives and markets along a commodification gradient, and ask for hybrid regimes that would be more suitable to the challenge of governing ecosystem services than pure markets or hierarchies.

An illustration of PES operating like markets is the category “tradable permits” where commodities such as carbon credits or Individual Transferable Quotas for fisheries are traded in order to reach an optimal allocation of costs and efforts. An illustration of those operating like bilateral payments is the category “Coasean-type agreements” where beneficiaries of given environmental services (or their intermediaries) negotiate with providers. Flat subsidies in the category “regulatory price changes” are another good illustration of bilateral governance.

Having such clearly separate groups of instruments is not only useful from a heuristic point of

view; we argue that it is crucial for policy makers to understand these differences because the impacts of each of these groups have no reason to be similar. Instruments operating like markets can be expected to induce better resource allocation, which may be translated as efficiency (Merrifield, 1996; Rolfe 2011). Critiques may see here negative impacts related to the commodification of nature, as fluid markets certainly need a higher degree of commodification of goods and services (Kosoy and Corbera, 2010; Pawliczek and Sullivan, 2011; McAfee, 2012). In contrast, instruments operating as payments may mostly deliver in terms of incentives, which may be translated as environmental effectiveness when service providers are more likely to make the desired decisions if incentivized than if coerced. Critiques may see here a potential for motivation crowding out when extrinsic motivations become dominant (Vatn, 2010; Fisher, 2012), or even a waste of financial resources when there is little additionality (Rico Garcia-Amado 2011; Fletcher and Breitling, 2012). However, commodification of nature seems off-topic with bilateral governance.

5. CONCLUSION

In this article we tried to position Payments for Environmental Services (PES) within market-based instruments (MBIs), departing from two previous findings: i) a typology of MBIs that attempts to clarify the concept; and ii) the assessment that PES and MBIs are next-of-kin policy instruments in discourses (i.e. part of the same family of instruments) but rarely presented as such in the scientific literature (where they look like false friends instead). To do so, we compiled a representative corpus of peer-reviewed scientific articles on PES. We then studied the distribution of these schemes within the categories of the typology of MBIs. We further studied the methods, approaches and conclusions of these studies. Four important messages result from this analysis.

First, although PES examples are found in all categories of the typology but one, PES schemes stand as a specific instrument. They are mostly either Coasean-type agreements (typically negotiated agreements between providers and beneficiaries) or regulatory price changes (typically subsidies for better practices). This finding is interesting as it might empirically confirm the assumption that practical obstacles to the development of Coasean-type agreements (especially high transactions costs) have probably induced more regulatory and government-financed schemes (or alternatively experimental schemes supported by

7. S. Todd Lowry further stipulates “the traditional economic analysis of exchange in a market setting properly corresponds to the legal concept of sale (rather than contract), since sale presumes arrangements in a market context and requires legal support primarily in enforcing transfers of title” (Lowry 1976, p.12; in Williamson (1979, p.248-249).

8. In this case, S. Todd Lowry, according to Williamson (1979), “would reserve the concept of contract for exchanges where, in the absence of standardized market alternatives, the parties have designed ‘patterns of future relations on which they could rely’ (p.13)” (p.249).

international organizations). Besides, we found a clear orientation of PES analyses towards poverty alleviation issues in developing countries, with little innovation compared to previous approaches to conservation and development.

Second, policy instruments are so complex and multi-dimensional that putting them in a limited number of categories is challenging: PES usually exhibit features of several categories at the same time. The lesson we are taking from such an analysis is that special attention should probably be devoted to an articulation of approaches at different levels for a given policy instrument that would be designed for a given environmental problem. Any given instrument may possess many characteristics that simultaneously relate to regulation, free market exchanges, negotiations, distribution of monetary rewards, etc. For instance, agro-environmental schemes may operate like flat subsidies or be one degree more sophisticated when reverse auctions are designed to set the price of payments in exchange for specific activities or land uses. So what should be considered as an instrument: the entire agro-environmental schemes or reverse auctions? Similar reasoning is applicable to many other initiatives, and the REDD+ mechanism triggers debates in negotiation forums to clarify which of its components are market-based and which are not (Pirard *et al.*, 2012).

A third message resulting from the above is that MBIs overall may actually include two contrasted groups of instruments: those resorting to fluid and highly competitive commodity markets, and those resorting more specifically to payments and monetary transactions between few agents solving a specific problem with contracts and bilateral governance. PES studied in this article usually belong to the second group with direct payments. Such a distinction becomes more and more relevant as advocates as well as critiques of MBIs and PES commonly advance their arguments in a general way and without proper reference to specific instruments under scrutiny. Both expectations and fears are immense, but all of them appear to often

be grounded in ideology rather than observation. We have found numerous instances of so-called market-based instruments that actually consist only in supporting certain types of land uses and agricultural practices with light conditionality and absolutely no process of commodification in sight. In this context, proponents and opponents to PES seem to often be praising or fighting ghosts at the same time.

A fourth and last message is the need for a more homogeneous and comparable set of research concepts and methodologies. This article has shown that scientific research on PES is heterogeneous regarding evaluation criteria as well as methodologies and approaches to undertake assessments. In this context, confusion might remain, leaving space for ideological views. While multi-disciplinary research is essential to apply different but complementary scientific approaches, there is a need for more comparative and cross-scale research that enables take-home lessons to be provided to policy-makers. This translates into precise terms to be used for similar objects (e.g. 'direct negotiated payments for ecosystem services' delivery instead of the generic and broad 'payments for ecosystem services'), systematic replication of analyses in many sites using the same research tools (e.g. household surveys, lab and field experiments, randomized-control trials), and undertaking of research that covers the range of evaluation criteria of relevance for policy-making (e.g. equity, effectiveness, efficiency, legitimacy, etc.). The challenges ahead thus lie in finding a balance between preserving independency of research and the expression of creativity and multi-disciplinary approaches on one hand, and structuring research funding in order to secure the production of comparable assessments for informing decision-making on the other. Nevertheless, only consistent and systematic research projects will allow the clarification of terms and the comparison of different policies based on objective and ideology-free impact assessments. ■

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