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PES what a mess?

An analysis of the position of environmental professionals in the conceptual debate on Payments for Ecosystem Services

Abstract

Payments for Ecosystem Services (PES) are becoming increasingly widespread as they are being promoted by government and non-governmental organization across the globe. Alongside this, an academic debate has unfolded regarding how PES ought to be conceptualized and defined. Using the first survey of environmental professionals on this topic, we explore their position in this conceptual debate in the UK. Our study shows that all aspects of the key academic debates are reflected in the views of environmental professionals, whose range of understandings suggests no viewpoint is either dominant or uncontested. Expecting all to share a single perfect definition of PES may be neither necessary nor feasible. However, at present this term invokes a very wide range of ideas that may generate frictions as PES is further implemented. This risks PES becoming a 'mess' from which few insights can be derived as to whether, when and why it is a useful instrument. It essential that those debating and proposing PES concepts more closely consider the complex processes by which professionals engage with and shape their application.

Keywords: conservation, environmental management, environmental governance, United Kingdom

1. Introduction

Payments for Ecosystem Services (PES) are becoming increasingly widespread as they are being promoted by government and non-governmental organization across the globe. Alongside this, an academic debate has unfolded regarding how PES ought to be conceptualized and defined. Wunder (2015) reviews the alternative definitions that have emerged and discusses how they diverge from his original and most widely accepted definition of PES as "A voluntary transaction where a well-defined service (or land-use likely to secure that service) is being "bought" by a (minimum) one ES buyer from a (minimum one) provider if and only if the ES provider secures ES provision (conditionality)" (Wunder, 2005, p. 3). The drive for proposing alternative definitions has often been to better embrace a large family of similar initiatives (self-declared as PES or not) as they have been implemented in practice, since the Wunder (2005) definition has often been critiqued as "narrow" and "too market-focused" (Wunder, 2015).

The way we define tools and management approaches has essential implications for the way they are designed and implemented (Wunder, 2015). This has triggered intense debates amongst academics in ecological economics (e.g. Gomez-Baggethun and Muradian (2015)) and also domains such as critical institutionalism (e.g. Van Hecken et al. (2015)) and political ecology (e.g. Kull (2015)). In the present study, we are interested in understanding the position of environmental professionals in relation to this conceptual debate, i.e. what do they understand by PES and in which respect they see them as being different from other environmental management/conservation instruments or approaches. Their views are of significant interest, since they will, in a variety of ways, shape interpretation, uptake and implementation of PES schemes in practice. Their influences are clearly demonstrated by experiences such as, for example, the Mexican federal PES programme, where the many actors involved in designing and shaping it promoted their own ideals of what PES can accomplish and the mechanisms for doing so, with consequences for what was implemented and achieved (Shapiro-Garza, 2013). Similarly, a Welsh case in the UK demonstrates how the complex responses of 'intermediary' conservationists, shaped by their experiences and attitudes, is key to charting and understanding how the concept may achieve practical influence (Wynne-Jones, 2012). Since many actors and institutions affect if and how PES are implemented, they need more attention if we are to understand how PES play out in practice (Van Hecken et al., 2015) and hence the implications for land management and conservation in the long-run. However, although understanding the views of environmental professionals is as least as important as understanding theoretically-derived viewpoints, they have so far received little attention (Sandbrook et al., 2013). To address this gap, we present the results of an online survey of 160 environmental professionals in the UK, exploring their definitions and understandings of PES, and discussing these in the context of key issues of the PES theory-practice debate.

As discussed by Waylen and Martin-Ortega (2018), the UK is one of several developed countries with a growing interest in PES (Matzdorf et al., 2014; Schomers and Matzdorf, 2013). Following one of the first national ecosystem services assessments ever made, the UK government made an explicit commitment to encouraging and facilitating greater use of PES in the future as part of the broader mix of policy instruments (Dunn, 2011). The government's Department for Environment Food and Rural Affairs (Defra), commissioned then three rounds of pilot PES projects between 2012 and 2015 (Defra, 2016) and produced a set of official best practice guidelines (Smith et al., 2013). In this context, in 2015 a workshop with cross-sectoral environmental professionals was hosted by us together with the Ecosystems Knowledge Network[1], with the aim of sharing experiences and ideas on PES in the UK. The participants at that workshop appeared to hold a wide range of understandings, attitudes and

[1] www.ecosystemsknowledge.net

questions about PES (Waylen et al., 2015), and so we therefore planned a survey to explore this further. This was not motivated by a view as to whether or not PES should be promoted, nor did we hold any assumptions that they are or can be better than any other instrument; but was a pragmatic response to PES being a topical subject in the UK and elsewhere.

The remainder of this paper is organized as follows: section 2 presents the key aspects of the conceptual debate around the notion and definition of PES. Sections 3 describes the methods used in this study. Section 4 presents and discuss the results, first providing an overview of the defining characteristics of PES according to our respondents and then discussing them in the context of those key academic debates. Conclusions of this study are presented in Section 5.

2. Key aspects of a conceptual debate

Table 1 summarizes the main alternative definitions of PES that have been proposed by the literature, as well as that included in the UK Defra's best practice guidelines for its relevance to the context of our study. Next we discuss them in the context of key conceptual debates.

Table 1. Alternative definitions of Payments for Ecosystem Services

Reference	Definition
(Wunder, 2005, p. 3)	A voluntary transaction where a well-defined service (or land-use likely to secure that service) is being "bought" by a (minimum) one ES buyer from a (minimum one) provider if and only if the ES provider secures ES provision (conditionality)
(Swallow et al., 2009, p. 5)	Contractual agreements and negotiated agreements among ecosystem stewards, environmental service beneficiaries, or intermediaries, for the purpose of enhancing, maintain, reallocating or offsetting damage to environmental services*
(Sommerville et al., 2009, p. 2)	An approach that aims to transfer positive incentives to environmental service providers that are conditional on the provision of the service
(Muradian et al., 2010, p. 1205)	A transfer of resources between social actors, which aims to create incentives to align individual and or/collective land use decisions with the social interest in the management of natural resources
(Pirard et al., 2010, p. 258)	A voluntary transaction in order to preserve or enhance at least one well-defined environmental service, between at least one provider, who clearly cannot be subject to the polluter pays principle, and at least one buyer, who offers a payment over a limited period as a means for investment in locally productive and sustainable activities
(Karsenty, 2011, p. 11)	Payment to an agent for services provided to other agents (wherever they maybe in space and time) by means of a deliberate action aimed at preserving, restoring or increasing and environmental services agreed by the parties
(Porras et al., 2012, p. 7)	A transaction in which a supplier or seller of the ecosystem service is responding to the offer of compensation from a single or multiple beneficiaries (NGO, private party, local or central government entity) and/or a beneficiary separate from the seller which is not a central government entity, compensation is conditional upon the land management practices specified by the program, and the voluntary component is only attached to the supply-side of the transaction in that the provider "voluntarily" enters in the contract

(Tacconi, 2012, p. 35)	A transparent system for the additional provision of environmental services through conditional payments to voluntary providers
UK Department of Environmental, Food and Rural Affairs (Defra) – (Smith et al., 2013, p. 13)	Schemes in which the beneficiaries, or users, of ecosystem services provide payment to the stewards, or providers, of ecosystem services
(Wunder, 2015, p. 241)	Voluntary transactions between service users and service providers that are conditional on agreed rules of natural resources management for generating offsite services

Source: Collected and expanded from Wunder (2015). *In their definition, Swallow et al. also re-define the term, not referring to PES but, instead to "Compensation and Reward Mechanisms for Environmental Services" (CRES). As indicated by Wunder (2015), this definition also relates to "Rewards for Ecosystem Services" (RES) as discussed by (Noordwijk et al., 2007) and to "Compensation and Rewards for Ecosystem Service Stewardship" or CRESS proposed by (Shelley, 2011, p. 210).

Conditionality

Conditionality is strongly emphasized in Wunder's original definition (2005, p. 3), where the service is being paid for "if, and only if, the ES provider secures ES provision (conditionality) […]". During early discussions on PES, it was common to assume that as long as the seller complied with whatever land-management action was agreed upon, the Coasean "magic" would occur (i.e. the social optimum would be attained via bargaining amongst services providers and beneficiaries). Wunder himself included the idea that the payment was for the service "or land-use likely to secure that service" (Wunder, 2005, p. 3). Consequently, PES schemes have generally focused on monitoring input conditionality (i.e. payment for action or intervention compliance) rather than output conditionality (i.e. service delivery) (Pattanayak et al., 2010; Porras et al., 2012). As an illustration, in a review of studies on forty water PES schemes in Latin America, Martin-Ortega et al. (2013) found that hardly any reported on the existence of mechanisms to monitor service conditionality.

As the field of ecosystem services has developed and more empirical evidence on the processes underpinning ecosystem services delivery has been gathered, it is becoming more and more evident that actual service delivery from interventions cannot always be assumed (McVittie et al., 2015). For example, for carbon sequestration projects, the link between land use (e.g. growing trees) and services (e.g. sequestering carbon) is generally well established (Pattanayak et al., 2010), but for forest-based watershed interventions is more difficult to demonstrate service provision because of complex landscape and climatic relationships (Mulligan et al., 2015). This has led to some hesitancy about conditionality which has been reflected in some of the newer definitions. Some of these are clearly not based on output conditionality, such as the one proposed by Porras et al. (2012, p. 7) in which compensation is conditional "upon the land management practices specified by the programme". In some other cases, as in Wunder's new definition (2015, p. 241), generating services are still the focus, but payments are only "conditional on agreed rules of natural resources management for generating offsite services". In a few cases, specifically Swallow et al. (2009) and Muradian et al. (2010), service conditionality does not explicitly feature at all. Although this partially reflects pragmatic concerns about service measurability, it directly affects the ability to assess the environmental effectiveness of PES in the long-run, for which there is not yet strongly consolidated evidence (Börner et al., 2017; Ojeda et al., 2008; Pattanayak et al., 2010). This is probably why some new definitions still keep output conditionality at their core, e.g. Sommerville's (2009) and Tacconi's (2012).

Public or private financing

Another debate concerns the public or private nature of PES (Schomers and Matzdorf, 2013). Vatn (2010) noticed that many PES schemes involve governmental intervention and public payments, leading to sub-divisions around the ideas of 'genuine', 'private', 'user-financed' or 'Coasean' PES versus 'PES-like', 'government-financed' or 'Pigouvian' types of PES (Vatn, 2010; Wunder, 2015). Coasean or private PES would correspond to Wunder's (2005) original definition, whilst in government-financed PES, a government or public body would act as the buyer on behalf of private service end-users (Engel et al., 2008; Pagiola and Platais, 2007). The Pigouvian conceptualization of PES is based on the welfare economics principle of subsidizing positive externalities within existing markets (Van Hecken et al., 2015). As Schomers and Matzdorf (2013) discuss in detail, this would differ from classical Pigouvian subsidies in that Pigouvian PES require payments to equal the marginal net benefit that is anticipated, whilst classical subsidies are set to be sufficient to achieve a predetermined standard and, hence, not necessarily reaching a Pareto-optimal allocation of resources. In this context, Schomers and Matzordf (2013) unequivocally place agri-environmental schemes amongst PES; whereas Pirard (2012) notes a lack of clarity with respect to whether these practices qualify as PES or not, since they often do not involve payments above implementation costs.

The debate goes on by making a further distinction between PES and MES (markets for environmental services), with the former encompassing government payment schemes and the latter being closer to Wunder's (2005) narrower market-based definition (Vatn, 2010). Corbera et al. (2007, p. 366) put the emphasis of this distinction on the underlying institutional framework, by which MES must have "a well-defined ecosystem service and a well-defined trading commodity, and active supply and demand sides must coexist", while in PES, the commodity is ill-defined and the government not only mobilises the resources as an intermediary to the payment but generates the demand at pre-established prices.

These distinctions are relevant for understanding the extent to which PES are really new instruments (which might bring new outcomes) or simply a relabelling of pre-existing schemes (e.g. environmental subsidies).

Voluntariness

The issue of payments being the result of a voluntary bargaining process between buyers and sellers has also been the object of debate (Martin-Ortega et al., 2013). Porras et al. (2008) noted that including reference to 'voluntariness' in a PES definition necessarily excluded non-market institutional arrangements such as government taxes and other non-voluntary funding mechanisms, such as user fees imposed by utilities. In their alternative definition, Porras et al. (2012, p. 7) propose, as Tacconi (2012, p. 35), to restrict voluntariness to the supply-side of the transaction only, i.e. that "the provider 'voluntarily' enters into the contract". Others do not mention it, e.g. Sommerville et al. (2009). This is partly related to the above discussion about the public and private nature of payments: in Pigouvian PES, the state acts on behalf of the service buyer (Engel et al., 2008; Schomers and Matzdorf, 2013).

This is also related to fairness and equity. As Farrell (2014) points out fairness and equity in the context of PES does not only concern distribution of costs and allocation of benefits (Corbera et al., 2007), and hence who has to pay to whom, but also what she calls 'franchise equity', i.e. "fairness in terms of access to the process of defining which services are to be conserved" (Farrell, 2014, p. 138). In this respect, the question is whether affected individuals have the possibility of being involved in determining their relationship with the marketed ecosystem services and rule-setting (Van Hecken et al., 2015). Martin-Ortega et al. (2013) found out that in 77% of the forty water PES schemes they analysed in Latin America, payment levels were set in top-down decisions, and only in 14% of the cases there was a direct buyer-seller negotiation. If the seller only has the option to accept or decline entry,

but cannot negotiate the price, or if the buyer has taxes or fees imposed upon them, then the principle of bargaining amongst parties is not met and franchise equity is reduced. Full participation in crafting rules may fit better with the original PES principle, but may limit PES to one-off bespoke schemes with high transaction costs.

Additionality

Additionality refers to the net benefits created by the PES schemes. It has been described in terms of two types of potential changes caused by PES: changes in behaviour by those managing or influencing natural resources, and/or changes in the level of provision of ecosystem services (Porras et al., 2012). Tacconi (2012) explicitly includes additionality in the PES definition; while most definitions make no direct reference to additionality or are ambiguous about it. For example, Swallow (2009) and Karsenty (2011) refer to "enhancing" or "improving" the ecosystem services provision, which could be seen implicitly as additionality, but they also refer to "preserving" (Karsenty, 2011), "maintaining", "relocating" and "offsetting damage" (Swallow et al., 2009), which can be questioned as forms of additionality. Wunder (2015) even proposes that is undesirable to bring it into the definition. His position is that additionality refers to an ex-post evaluation of PES impacts and that "we better not mix impact assessments into concepts and definitions" (Wunder, 2015, p. 236), with the argument that we might end up needing to "un-label" PES projects if they do not deliver additional services. He suggests that would probably need to be the case for the most famous PES scheme of all, the Costa Rican forest Pago por Servicios Ambientales, for which additional effectiveness is still yet to be established (Pattanayak et al., 2010). A counterargument could be that still PES initiatives could, by definition, be set to reward exclusively additional services, i.e. not just compensating damage or loss of service.

Interpretations that emphasise additionality would be expected to require new PES projects clearly distinguish and justify what they will offer over and above other past and concurrent initiatives; whereas those less concerned with additionality will simply seek to demonstrate the project can deliver some level of environmental benefit.

Defining PES by its goals

Some of the new definitions include normative features, i.e. statements about what PES should achieve. This is the case of Muradian et al.'s (2010, p. 1205) "transfer of resources between social actors, which aims to create incentives to align individual and or/collective land use decisions with the social interest in the management of natural resources". This is also the case of the broader concept of Compensation and Reward Mechanisms for Environmental Services (CRES), by which mechanisms "are positively biased towards disadvantaged stakeholders" (i.e. be pro-poor) (Noordwijk et al., 2007, p. 9) or that of Pirard (2010, p. 258) where PES are defined as "a means for investment in locally productive and sustainable activities". Including attention to outcomes is thus often associated with attempts to achieve outcomes that are both sustainable and equitable.

As with additionality, this approach has been questioned, seeing it problematic to let goals for PES to "dictate the way we define the instrument up front" (Wunder, 2015, p. 238), because of the risk that this would bring to having to "backtrack" the classification if goals are not achieved. This relates to wider critical institutionalism debates on how institutions are shaped and ought to be designed. Some authors question the extent to which institutions "can be designed to "fit" specific human nature problems" with "overly structuralist models" (Van Hecken et al., 2015, p. 117) or that it is just a matter of getting the science 'right' (Kolinjivadi et al., 2017).

Anthropocentrism and monetization of ecosystem services

Current debates about anthropocentrism and monetization of ecosystem services in conservation (e.g. Sandbrook et al., 2013) influence and feature prominently in the current debates about PES, notably with respect to the perceived risk of the commodification of nature (Scales, 2015), that is: "the symbolic and institutional changes through which a good or service that was not previously meant for sale enters the sphere of money and market exchange" (Gómez-Baggethun, 2014, p. 67). Those concerned about commodification argue that relying on economic reasoning and transactions will encourage a longer-term changes in values or mind-sets relating to environmental protection, changing conservation logic "from moral obligation or community norms towards conservation for profit" (Rode et al., 2015, p. 273).

This is relevant to the conceptualization of PES as market-based instruments. While it is increasingly recognized that most PES programmes do not operate in practice as free markets (Martin-Ortega et al., 2013; Muradian and Gómez-Baggethun, 2013; Sandbrook et al., 2013; Vatn, 2010), there is a vivid debate about the extent to which they reflect a market 'rhetoric' and reflect the neoliberalization of environmental governance (Fletcher and Büscher, 2017). Some argue that the promotion of PES is based on an ideology that responds to an agenda of global corporate interests (Büscher, 2012).

A growing number of scholars are suggesting adjustments to the PES concept, arguing for the adoption of hybrid (i.e. not strictly Coasean) conceptualizations that better reflect current PES practices (Van Hecken et al., 2015). However, those who have concerns about neoliberalism may reject any form of PES. For example, Fletcher and Büscher (2017, p. 225) argue that PES are neoliberal in nature and that this makes them inherently contradictory with the purpose that they aim to address, rejecting these conceptual adjustments (or, in their words, "retrofitting") as theoretically and empirically "misguided".

3. Methods

This research used a structured online survey purposively targeted at any individual "who works on any topics related to nature conservation or environmental management within the UK". The survey did not presume or require an expert understanding or positive attitude to PES.

The survey commenced with a set of categorical questions allowing us to understand the professional background of the respondents and to assess their self-reported expertise on PES. After that, a series of closed and open-ended questions explored participants' awareness of projects in the UK that they would see as PES. Respondents were then asked to provide their own definition of the concept of PES. While the term PES had been used in the introduction of the survey and some of the pre-screening questions, it had not been defined in any explicit or implicit way at that point in the survey. Respondents were instructed to use their own words and were explicitly encouraged not look the term online or in any other source.

After eliciting respondents' spontaneous definitions, they were given a 'minimum grounds' definition of PES, based on common core aspects of the definitions used in the literature: *"Most people agree* PES involves people or organisations (*"*buyers*"*) paying other people or organisations who manage natural resources (*"*sellers*"*) in order to deliver desired benefits and services from nature. However, *there is more disagreement about other attributes and details that may or may not be part of PES".* Thereafter, we asked them about eleven additional attributes or conditions that have been suggested as part of PES definitions by the literature. These included aspects or characteristics of the arrangement, for example, the presence of an intermediary, voluntariness, monetization of ecosystem services, etc. The full list of items is reported in

Table 2. Respondents were asked to select which, if any, of those eleven attributes they would consider to be an "essential' feature, an 'optional' feature, or a feature 'incompatible' with PES. Respondents were also given the option to select 'don't know'.

Respondents were then asked if they saw PES as related to other environmental management mechanisms or approaches. Responses were elicited using a Likert scale (completely unrelated, shares some features, similar, very similar and identical – a 'don't know' option was also available). These included initiatives that explicitly describe themselves as PES, such as the Peatland Code[2], as well as initiatives that do not, but had been spontaneously associated with PES in our preceding workshop (Waylen et al., 2015). These included approaches that involve some kind of economic transfer or co-investment (Wunder, 2015), such as: Corporate Social Responsibility (CSR), Agri-Environmental Schemes (AES), capital investments in environmental projects, visitor giving schemes (voluntary donations from visitors to benefit the places they go to), public donation to environmental NGOs, offsetting (e.g. biodiversity or carbon), eco-labelling, ecotourism or green taxes (e.g. charges for environmentally-damaging activities). The list also included mechanisms without an explicit economic transfer, but that have been related to the ecosystem services paradigm in one way or another: i.e. Integrated Catchment Management (Niasse and Cherlet, 2015) and participatory holistic management as prescribed by the Ecosystem Approach (Waylen et al., 2014).

The survey questionnaire included two additional sets of questions on expectations of the effects of PES and ideas about if and how to go about further developing PES in the UK, including priorities for future research and practice. Since the focus of the present paper are the concept and its definition, the results of these additional sections are not analysed here. Instead, they reported in Waylen and Martin-Ortega (2018), but are brought into the discussion here when relevant.

The survey, which was programmed by and hosted in the University of Leeds' web-service, was piloted three times in spring 2016 for its content and functionality. Questionnaire testers included environmental professionals drawn from several sectors (public sector, third sector, environmental knowledge broker and academic), as well as an expert in survey development. The survey was subsequently open to participants from the 10th of May to 14th of July 2016. Emails to individuals, listserves and networks were used to promote the survey using the extensive network of contacts of the authors and their partner organizations. A snowball process was promoted as contacted individuals were asked to circulate the survey amongst their own networks. Our emails emphasised that we encouraged any environmental professional to take part on the survey, regardless of their pre-existing understanding or views on PES. However, there may have been some self-selection by professionals with a degree of confidence in their understanding of PES, or a positive view of PES.

On average, the questionnaire took around twenty minutes to be completed. In total, 160 individuals started the survey and 100 reached the final question (thus N varies in the results reported below). Respondents had a range of job roles and professions related to environmental management, and were fairly evenly spread across the private sector (28.1%), public sector (26.9%), third sector (22.5%) and academia (also 22.5%), in roles that ranged from enabling, studying or directly carrying out management of nature and the environment. The majority (60%) had a training or educational background in the natural sciences (e.g. ecology). Other backgrounds were economics (7.5%), social sciences (4.4%), engineering (2.5%) and business (0.6%). An additional 8.1% of respondents had a background not in any these groups (ranging from farming to legal studies) whilst 16.9% had mixed-

[2] The UK Peatland Code, launched in 2013, is an initiative by the UK Department of Environment, Fisheries and Rural Affairs (Defra) and the International Union for the Conservation of Nature. The Code is designed to support funding from businesses interested in restoring degraded peat bogs as part of their corporate social responsibility (CSR) commitments. The Code is currently in a piloting stage (Reed et al., 2017).

disciplinary training (e.g. economics and natural science). Most respondents (95%) considered themselves to be completely or somewhat familiar with the idea of PES and more than a third (37%) considered themselves to be experts on PES.

Closed questions were analysed using descriptive statistics (frequencies and Fishers' Exact test for associations). Open ended questions were analysed for their content by identifying and grouping themes as they emerged from the data (Ritchie and Lewis, 2003). We tested for the relationship between individual attributes (e.g. type of environmental professional or background) and other responses to the survey but did not usually observe statistically significant associations, so the presentation of our results does not differentiate between these groups. When relevant, responses by one individual were cross-checked across several questions, and open and closed responses were analysed in combination for complementarity (Greene et al., 1989). Within our sample, it was not possible to use statistical tests to differentiate groups of respondents (e.g. agency staff versus academics) due to the small sample sizes of each group. We did explore the data for indications of distinct response patterns, for selected topics (e.g. in views on conditionality, between policy makers and farmers) but did not see any obvious trends between groups. Our results section therefore deals with our respondents as one group.

Results are discussed in the context of academic arguments made in the literature as described in section 2. Besides, we also discuss them in the light of Defra's guidelines (Smith et al., 2013) and synthesis evidence report (Dunn, 2011), since these are the official set of best practice guidelines available to our respondents as well as the most likely 'point of entry' to the concept of PES for many of them. While Defra's documents are not guidance to meet statutory environmental obligations, they are aimed at helping "with the design and implementation of PES" and are explicitly aimed at "key participants in PES schemes" (Smith et al., 2013, p. 9), so they can be seen a framing document that could provide a common understanding for those involved in PES practice in the UK. It is therefore interesting to identify the extent to which they are achieving that shared understanding amongst environmental professionals.

4. Results and Discussion

We first present an overview of respondents' understanding of PES' defining characteristics and their relation to other concepts; we then analyse and discuss what this means for each of the debated aspects of PES that were introduced in section 2.

Overview of defining characteristics of PES

Respondents' own definitions of PES, which are reported in full in Appendix 1[3], largely focused on four key aspects: buyers, sellers, payments and ecosystem services, with only a minority making any references to other aspects of the arrangement. For example, only 5% of the respondents explicitly mentioned that the arrangement should be voluntary and less than 5% mentioned aspects related to conditionality or additionality. Providing comprehensive answers can be difficult without preparation; however, when respondents were presented with a list of potential-aspects of PES (

Table 2) some selected these as 'essential' but many still thought they were 'optional'. Few thought any of the aspects provided 'should not feature' as part of PES.

Table 3 presents the significant associations resulting from the Fisher's Exact Test. For example, respondents who considered the seller should have to enter the programme voluntarily were also significantly likely to think that both buyers and sellers should participate in setting the price. All

[3] Individual quotes are referred from here onwards with a SD (spontaneous definition) code.

possible association across features were tested so any combination not shown in the table is to be taken as not significant. These combinations are discussed next in the context of the conceptual debates further on.

Table 2. Responses to features of PES schemes (N = 113)

↓**Potential features of PES schemes** **% choosing →**	**Essential**	**Optional**	**Incompatible**	**Don't know**
An intermediary is involved in setting up and/ or running the PES project	18%	74%	3%	6%
Payments to the seller are conditional on them carrying out certain actions ("input conditionality")	59%	34%	3%	4%
Payments to the seller are conditional on the service actually being delivered ("output conditionality")	50%	42%	3%	5%
Sellers enter the programme voluntarily	47%	41%	6%	6%
Both buyers and sellers participate in setting the price	36%	53%	3%	8%
Buyers are the government or a public body	6%	79%	8%	8%
Payments are made repeatedly over a period of time, in order to sustain action (rather than a one-off payment for a one-time intervention)	35%	58%	3%	4%
Sellers must receive payments that exceed their costs (i.e. they receive more than just compensation for costs incurred)	32%	51%	11%	6%
Values of ecosystem services are monetized	34%	55%	6%	5%
Services provided by PES are additional to those already existing before it began (i.e. something new must be provided)	27%	61%	8%	5%
Buyers are a private entity (e.g. NGOs, individuals)	3%	86%	5%	6%

Table 3. Associations across respondents views on Essential, Optional and Incompatible features of PES schemes*

		Value	p-value	N
1.	Sellers enter the programme voluntarily * Both buyers and sellers participate in setting the price	9.20	0.04	54
2.	Buyers are the government or a public body * Buyers are a private entity (e.g. NGOs, individuals)	24.28	0.00	54
3.	Sellers enter the programme voluntarily * Buyers are the government or a public body	11.90	0.01	54
4.	Sellers enter the programme voluntarily * Buyers are a private entity (e.g. NGOs, individuals)	8.32	0.05	56
5.	Both buyers and sellers participate in setting the price * Buyers are the government or a public body	11.67	0.01	54
6.	Both buyers and sellers participate in setting the price * Buyers are a private entity (e.g. NGOs, individuals)	10.40	0.02	54
7.	Buyers are the government or a public body * Sellers must receive payments that exceed their costs (i.e. they receive more than just compensation for costs incurred)	11.92	0.01	53
8.	Sellers must receive payments that exceed their costs (i.e. they receive more than just compensation for costs incurred) * Services provided by PES are additional to those already existing before it began (i.e. something new must be provided)	12.35	0.01	51
9.	An intermediary is involved in setting up and/ or running the PES project * Sellers enter the programme voluntarily	8.23	0.05	51
10.	Payments to the seller are conditional on them carrying out certain actions ('input conditionality') * Payments are made repeatedly over a period of time, in order to sustain action (rather than a one-off payment for a one-time intervention) SIG 10%	8.01	0.07	48
11.	Payments to the seller are conditional on the service actually being delivered ('output conditionality') * Payments are made repeatedly over a period of time, in order to sustain action (rather than a one-off payment for a one-time intervention)	19.44	0.00	50
12.	Payments to the seller are conditional on the service actually being delivered ('output conditionality') * Sellers must receive payments that exceed their costs (i.e. they receive more than just compensation for costs incurred)	11.56	0.01	52
13.	Sellers enter the programme voluntarily * Sellers must receive payments that exceed their costs (i.e. they receive more than just compensation for costs incurred)	12.04	0.01	52
14.	Buyers are the government or a public body * Payments are made repeatedly over a period of time, in order to sustain action (rather than a one-off payment for a one-time intervention)	12.57	0.01	52
15.	Payments are made repeatedly over a period of time, in order to sustain action (rather than a one-off payment for a one-time intervention) * Sellers must receive payments that exceed their costs (i.e. they receive more than just compensation for costs incurred)	13.37	0.00	49
16.	Payments are made repeatedly over a period of time, in order to sustain action (rather than a one-off payment for a one-time intervention) * Services provided by PES are additional to those already existing before it began (i.e. something new must be provided)	9.01	0.04	50
17.	Payments are made repeatedly over a period of time, in order to sustain action (rather than a one-off payment for a one-time intervention) * Buyers are a private entity (e.g. NGOs, individuals)	20.23	0.00	53
18.	Sellers must receive payments that exceed their costs (i.e. they receive more than just compensation for costs incurred) * Buyers are a private entity (e.g. NGOs, individuals)	10.39	0.01	54
19.	Values of ecosystem services are monetized * Services provided by PES are additional to those already existing before it began (i.e. something new must be provided)	8.27	0.05	51

*Fisher's Exact Test is employed instead of Chi-Square of independence because the lowest expected frequency in any cell is <5. To understand the distribution of responses across 'essential', 'optional' and 'should not feature', for the positive associations, please consult the cross-tabulations in Appendix 2.

Respondents were asked about similarities between PES and a variety of other environmental management approaches described in section 3. These were mostly perceived as similar but not identical to PES (though all concepts were rated as identical by one or a few respondents). The schemes most often seen as closely related were Integrated Catchment Management (Marshall et al., 2010) and Biodiversity Offsetting (Pirard, 2012). Schemes that were most likely to be seen as unrelated – albeit sharing some features – were Corporate Social Responsibility, Ecotourism, Visitor Giving schemes, Green taxes and Eco-labelling. Most split views regard Agri-Environment Schemes (AES) and the Peatland code. AES was seen as similar, very similar or identical by exactly half of the sample. The Peatland Code is seen as identical or very similar to PES by 20% of the respondents, while it is seen as only sharing some features or incompatible with PES equally by another 20%. The split views on the Peatland Code is particularly interesting since it explicitly portrays itself as a PES (Reed et al., 2017).

Conditionality

As explained, definitions conflict, or are ambiguous, as to whether PES should emphasise input and/or output conditionality. In the UK, Defra clearly identifies "genuine PES" with the need for there to be "a clear relationship between the type of land use being promoted and the ecosystem services delivered" so that conditionality of payment is based on the service provided (Dunn, 2011, p. 42). However, this claim is somewhat diluted with reference to the fact that "there should ideally be a clear understanding" of these relationships and that this would be an "ideal payment system" [emphases added], potentially admitting the possibility of non-ideal but still functional PES schemes. This ambiguity is reflected in our results too. A substantial proportion of the spontaneous definitions included reference to payments being made to provide something, and half of the respondents consider it is essential to have payments conditional on delivery of service(s); but even more people (59%) see input conditionality as essential (Table 2).

One might expect that monitoring environmental performance of PES would seem to be crucial to those who are paying and for the overall consideration of the success of PES (Porras et al., 2012). However, those respondents who might fund or enable PES initiatives (e.g. in policy positions) did not seem to place more emphasis on conditionality than others. Indeed, reference to service monitoring was rare, with only one explicit reference to the fact that "there should be some verification of service provision" (SD53).

Public or private financing

Our survey results suggest that UK environmental professionals do not have strong views about whether or not buyers need to be public or private bodies. The issue was only mentioned once in the open definitions, whilst when explicitly asked about this, only small proportions of respondents saw government or public bodies as buyers being either essential to or incompatible with PES (Table 2). Similarly, few stated that private buyers are either essential or conversely incompatible.

A few (but not many) respondents' spontaneous definitions and other open answers resonate with the idea that PES differ from classical Pigouvian subsides, in that they are about paying for the value of a service (rather than just meet a set standard) (Schomers and Matzdorf, 2013). This could be inferred for example from quotes such as "[PES is a way to] capture and value ecosystem services by creating a market for those services*"* (SD30) and *"[…]* putting a price on the value that nature provides*"* (SD13). As mentioned, views were somewhat split on whether or not PES are equivalent to agri-environmental schemes (which are government financed).

The specification of sellers needing to receive payments over and above their cost (contrary to what happens in most agri-environmental schemes) did not come up in open definitions. When prompted to rate whether or not payment should exceed costs, one third of respondents thought this is an essential

feature, i.e. to provide "*an element of profit"* (SD6), with most of the remainder (51%) seeing it as optional (Table 2).

In sum, UK environmental professionals remain somewhat uncommitted about how PES are distinct from what the literature has referred to as MES (Corbera et al., 2007; Vatn, 2010). There is not a mainstream position resonant with Schomers and Martzdorf (2013) unequivocal view of agri-environmental schemes as PES. This is interesting in the UK context, given that Defra's guidelines explicitly include Agri-Environment Schemes as a form of PES (Smith et al., 2013). This further relates to the issue of voluntariness and commodification discussed next.

Voluntariness

Voluntariness is one of the few issues that were mentioned in several spontaneous definitions of PES, but even then only by a small minority and with no reference to the need of both buyers and sellers to participate in setting up the schemes' rules. Views were particularly divided as to whether voluntary participation of the seller is essential or optional (Table 2). There was no significant association between seeing seller participation as voluntary and seeing buyers' and sellers' participation in price setting as essential or optional (Table 3)[4]. Taken together, it seems respondents' had no strong views about emphasising voluntariness.

This debate links to the above discussion on public and private financing and whether PES are to be considered purely as market transactions between private agents (Pirard, 2012; Vatn, 2010). We find statistically significant associations across respondents' perceptions on whether the buyer needs to be a public or a private entity and their considerations regarding whether the seller should only enter the schemes voluntarily, as well as regarding whether the parties should participate in the price setting (Table 3). However, the results do not show a strong mainstream position: there is one group of respondents who clearly limit PES to entirely private transactions (they see a public or government body as feature incompatible with PES and see the seller entering the programme voluntarily and both parties participating on setting the price as essential), but it is only a small group (see cross-tables 1, 3 and 5 in Appendix 2). Moreover, those who consider private buyers as essential, often see sellers entering the schemes voluntarily and price negotiation as optional (Table 3). This reinforces the interpretation that UK environmental professionals remain somewhat uncommitted about the PES and MES distinction as defined by Vatn (2010). This can also be further discussed in the context of commodification (see further on).

Our results also suggest that the issue of equity franchise in the PES context (Farrell, 2014) has not strongly percolated the UK's practitioners' discourse yet. On the one hand, the lack of a stronger emphasis on franchise equity might not be seen as surprising, since this debate has predominately taken place in developing and indigenous contexts (e.g. Farrell's (2014) analysis is of REDD schemes; and Corbera et al.'s (2007) study is of Meso-America). On the other hand, however, one might have expected it to come up more strongly considering the stakeholder participation is a concept generally present in UK discourse on environmental management.

[4] Although the Fisher's Exact test in Table 3 indicates a significant difference (p-value = 0.04) the cross tabulation in Appendix 2 (cross table 1) shows that the differences only apply to seeing the features an incompatible and not between the essential and optional categories.

Additionality

Additionality – the need for PES to generate new or increased pro-environmental actions and/or ecosystem services – was seen as essential by a quarter of our survey respondents (

Table 2). Furthermore, spontaneous definitions explicitly included reference to the fact that actions should involve an improvement in the provision of ecosystem services. This is in line with UK Defra's guidance on PES, which does explicitly include additionality considerations (Dunn, 2011; Smith et al., 2013). Interestingly, although additionality could be seeing as incompatible with off-setting (e.g. of carbon or biodiversity) since it does not provide an improvement or additional service but rather compensates for the loss of one, almost half of our total sample (44%) considered offsetting to be similar, very similar or identical to PES (Table 2), resonating with Swallow's (2009) definition which does include service relocation and damage off-setting.

This further contrasts with the fact that UK professionals have voiced concern that PES should not reverse the "polluter pays principle" (Waylen and Martin-Ortega, 2018) in line with some literature e.g. Pirard et al. (2010). This is where both types of additionality (environmental and behavioural) meet. Some of our respondents clearly refer to PES having to reward actions (behaviours) over and above regulatory (environmental) requirements. For example: *"[…*payments to] enhance [ecosystem services] above the level that would be expected to comply with the public policy and/or good practice*"* (SD23) and "The services provided are over and above regulatory requirements *[…]"* (SD6). Again this resonates with Defra's guidelines: "costs of measures are borne by farmers to meet these reductions in line with the polluter pays principle. PES to farmers should then refer to the meeting of objectives beyond these legal requirements" (Dunn, 2011, p. 32). Interestingly, there was no significant association between those considering payments to sellers exceeding costs as an essential feature and those considering additional services also as essential (Table 3). This can be interpreted as additionality being recognized but not a priority, as nicely illustrated in SD10: *"*[PES are] Any payment that for an additive service/benefit from an ecosystem [sic]. I would argue that in many cases the additive element can be relaxed, in favour of assured provision or to correct for prior market failure*"*. In summary, additionality is clearly salient, but is not always referred to with consistency within and between respondents' answers.

Defining PES by its goals

In a way, some of the above debates are also debates about whether PES should be defined by its goals, e.g. the debates about output conditionality and additionality could be considered part of defining PES by achieving what is supposed to achieve (i.e. actual delivery services or provision of services additional to current levels). Thinking more broadly about whether PES are defined by their capacity of ensuring optimal resource use, beneficial collective outcomes and broader ecologically-sustainable governance (Muradian and Gómez-Baggethun, 2013; Van Hecken et al., 2015), it is clear from our results that our respondents do not hold a widespread common position. However, the debate is present and well-illustrated by a few respondents who argue that "PES can be about providing market-based solutions to environmental problems but equally it can be about trying to find equitable solutions to environmental problems" (SD38). Unsurprisingly, the pro-poor argument is not as relevant in this UK context as it is in developing countries, but the reference to equitable solutions does resonate with the arguments of beneficial collective outcomes (Van Hecken et al., 2015). The quote *"[t]he purpose of PES is to promote* the use of land from a different view point" (SD22) also resonates with Muradian et al.'s (2010) re-alignment of land use decisions.

Interestingly, in these quotes there is often an element of aspiration, illustrated by "PES can *be about […]* trying to find equitable solutions" in the quote above, or by this one: *"PES is an* attempt *to […] make use* of the services economically efficient and so (hopefully*) sustainable"* (SD17). This is linked to the fact

that generally, environmental professionals seem cautiously positive about the environmental, social and economic consequences of PES, i.e. they expect them mostly to be positive, but they are not acritical with the risks or potential downsides of implementing PES and the need for careful implementation Waylen and Martin-Ortega, 2018).

Anthropocentrism and monetization of ecosystem services

Respondents' answers indicate that respondents associate PES with providing benefits to humans and society, rather than conserving nature for its own sake, clearly aligning with the anthropocentric focus of ecosystem services-based approaches (Martin-Ortega et al., 2015). For example, in spontaneous definitions PES was referred to as: "Compensating people for conserving a landscape that provides crucial tangible and intangible benefits for people*"* (SD49) and *"the method by which landowners are* paid to provide, protect and facilitate ecosystem services that satisfy an anthropocentric *need"* (SD7).

While there was mention of valuation of ecosystem services to internalize externalities - e.g. "At the heart of it PES is a way of rectifying the failure of markets to capture and value ecosystem services by creating a market for those services*"* (SD30); it is interesting to note how only about a third of our sample saw monetization of ecosystem services as essential to PES (Table 2).

The data do not indicate explicit concerns about commodification or the neoliberalization of conservation, except for one very noticeable exception, where a respondent defined PES as *"Selling air, water,* landscape for money. Privatising nature. Depriving the general public of any existing rights to access *nature that they currently retain"* (SD37). We interpret this as UK environmental professionals to generally have a pragmatic stance on PES as suggested by Sandbrook et al. (2013), i.e. respondents are not necessarily ideologically driven in their views about PES, but looking at it as a supplementary mechanism to address the existing challenges on environmental management and possibly increase funding opportunities (Waylen and Martin-Ortega, 2018). In this sense, PES are generally seen as something worth trying where other approaches have failed or as complementary to other approaches (Waylen and Martin-Ortega, 2018), in line with the suggestions made in literature about PES being complementary to a broader policy-mix (Muradian and Gómez-Baggethun, 2013).

Similarly, we do not identify a noticeable critique amongst our respondents of PES on the prioritization of efficiency over equity, as discussed by the literature (Farley et al., 2011; Muradian et al., 2010). Kosoy and Corbera (2010) refer to PES as a "commodity fetishism" arguing that the re-creation of new ecosystem services commodities disguises the social relationship underling their production process, and potentially increasing power asymmetries and dependencies. Interestingly, one of our survey respondents saw in PES exactly the opposite: "recognizing that [the] mis-match in the scale of impact with the scale of decision-making often has important implications in terms of equity and power dynamics*"* (SD38). This would resonate with Defra's explicit link between valuation and distributional effects: "An important advantage of taking an ecosystem services approach is that there is a clear focus on valuing ecosystem services and understanding who benefits/uses the service and who must bear the cost of delivery" (Dunn, 2011).

However, this is probably the area in which the possible self-selection bias of our sample might have greater influence on the results. It is possible that environmental professionals strongly opposed to PES or cynical about the purpose of this research might not have taken the survey, so that the views of those concerned with equity, commodification and neoliberalization are underrepresented.

4. Conclusions

The popularity of Payments for Ecosystem Services (PES) as a mechanism for environmental management has led to a proliferation of initiatives. This has been accompanied by an academic debate on whether these divergent practices ought to still to be labelled as PES and by propositions of alternative definitions aimed at broadening the original market-based ones. Using the first survey of environmental professionals on this topic, this study has identified that environmental professionals in the UK do not take a clear position in relation to this conceptual debate, with a lack of consensus as to the defining characteristics of PES and how they compare to other environmental management mechanisms. No viewpoint is either dominant or uncontested. This variety of views to some extent reflects what has been found by Sandbrook et al. (2013) study of conservationists' views on market-based instruments internationally, and we echo their recommendation that we should be cautious about over-generalising their views.

This is relevant not just for purely intellectual reasons, but because the way in which environmental professionals understand and engage with environmental management concepts will have important implications for their practices, and importantly, expectations for what can be achieved. If everybody agrees what they are doing, the label(s) used to describe it might not matter. However, we must not assume everyone has necessarily a "shared understanding" of PES, even if they all use the PES label. For practitioners this could lead to working at cross purposes and using different criteria to judge success, leading to unexpected conflicts and disappointments. For academics, this can complicate attempts to understand what PES can offer, and its pros and cons versus other ways of working. If theory bears little relation to practice (as seems to be particularly the case with purist Coasean representations of PES), then theory might be said to have little relevance. At the same time, if we continue to expand the concept of PES to embrace any kind of environmental management mechanism with some sort of economic element to it, little theoretical grounding is left from which to ascertain whether and when it might be a useful instrument versus other approaches.

Without acknowledging the complex processes connecting theory and practices, the present situation risks becoming a 'mess' from which few insights can be derived. In response we do not advocate the need to agree and impose a universal definition of PES: indeed a certain level of 'fuzziness' around the concept might be beneficial. However, it is essential that those debating and proposing PES concepts more closely consider the complex processes by which professionals engage with and shape the application of abstract constructs (e.g. Shapiro-Garza, 2013; Wynne-Jones, 2012). As part of this, it would be valuable for further analysis to differentiate groups of professionals with different roles and influence (for example, policy-makers versus project managers) and to track how their views relate to practices. Meanwhile, those considering developing a PES scheme should ensure they elicit and discuss different understandings and expectations, ideally from an early stage. Principles and ideas for enabling such discussions already exist within guidelines for stakeholder participation in environmental management (Reed, 2008) which any process should revisit and resource.

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