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**A Discussion of the  
Debates Underpinning  
Agri-Environmental  
Schemes as a form  
of Payment for  
Ecological Services**

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## Abstract

Payments for Ecological Services (PES) has rapidly emerged around the world as a key environmental governance approach. This paper is concerned with Agricultural Environmental Schemes (AES) as a particular form of PES to improve the environmental performance of agriculture particularly in relation to water quality in Sweden. Win-win descriptions prevail in AES policy discourse to describe the simultaneous achievement of environmental goals and economic outcomes for farmers. AES are underpinned by an instrumental assumption that farmer behaviour can be influenced towards adopting better environmental practice by providing monetary incentives (or at least compensation). This paper has touched on a number of contentions in the PES literature, including: doubts about how well standardised PES schemes link with local conditions; how and whether PES schemes can engender local innovation; procedural and distributive equity concerns; claims that monetary incentives may 'crowd out' socially derived sources of motivation (local norms); and doubts about whether PES schemes, disembedded from local institutions, can deliver 'sufficient' environmental behavioural change. Given the relatively recent emergence of AES schemes, it is important that we learn more from the experience of implementation. Critically oriented empirically-based research then has the capacity to work as a circuit breaker between ideologically driven arguments that side either for or against the use of market mechanisms, such as AES for environmental governance. Such insights may be useful to help focus research on farmer engagement with AES that subjects it to greater empirical scrutiny and validation.

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## Introduction

Designing policies to conserve and sustainably manage environmental resources and biodiversity is extremely challenging, given the complex and dynamic nature of social and ecological systems, which are often poorly understood (Ostrom 2007). The purpose of this paper is to explore some of the debates associated with agri-environmental schemes (AES) as a form of payment for ecological services (PES). As Pirard et al. (2010) and others note (see Muradian et al. 2013), the rapid emergence of PES has meant that a somewhat hasty consensus has been formed supporting the merits of these payments. An examination of the key design elements, underpinning concepts and related debates can shed light on contested assumptions that need to be subjected to greater empirical scrutiny and validation. Therefore a key question that underpinned the development of this paper is whether PES are/should be perceived as purely instrumental (incentive changes=> behavioural changes) or as a way to induce long-term change in norms (without an ongoing need to maintain incentives). This report does not explicitly seek to answer this question, but rather map out its contours.

While a comprehensive review on the diverse design forms of PES is beyond the scope of this working paper, a broad understanding of the debates over PES and their practical consequences as they may relate to AES is instructive to inform and reflect on empirical studies and policy initiatives. This report provides background information about AES as a policy instrument to induce voluntary cooperation among farmers to participate in measures aimed at mitigating the worsening eutrophication problems in the Baltic Sea Region. Examining the debates about the assumptions embedded in AES helps to understand the potential of and limits to this approach and therefore would help to frame an empirical study of farmer engagement with AES. Ultimately AES are aimed at changing farming practices (e.g. planting riparian strips and catch crops, undertaking spring ploughing to reduce nutrient leaching).

Increased scrutiny of AES is also particularly important in a European context at a time when the European Union (EU) has recently reviewed the Common Agricultural Policy (CAP) amongst much discussion about the growing imperative of 'greening agriculture'. It can be expected that changes flowing from recent EU policy will affect the EU member states' domestication of CAP requirements into national AES measures. In this

shifting institutional context that is placing increasing focus on AES, this paper elaborates and discusses the main contentions related to this policy instrument. Given the problem of eutrophication in the Baltic Sea, I particularly focus on the way AES are being designed with the aim of changing farming practices to reduce the effects of production on downstream water quality. Widespread farmer involvement in AES has been seen by many as the key means to achieve a gradual change to more sustainable agricultural practices. In this context understanding motivations for participation in these voluntary schemes is crucial in any investigation of their effectiveness (Ingram et al. 2013). This form of PES is also most relevant to the research project, *Cooperating for sustainable regional marine governance – The case of fisheries and nutrient run-off from agriculture to the Baltic Sea*,<sup>1</sup> to which this report is linked.

The report proceeds in the following way. First of all there is a brief account of the eutrophication problem in Baltic Sea and its relationship to agriculture as well as a brief description of the Swedish AES, which is the context in which this report has been developed. This is then followed by a description of the emergence of PES and insights are offered into how AES as a form of PES has been conceptualized in EU institutional contexts. The core of the paper discusses a number of debates surrounding the concepts underpinning AES as a form of PES. The paper then concludes by reflecting on these debates and emphasises some key points that require further empirical examination.

## Context

### *The socio-environmental problem in the Baltic Sea Region*

Nutrient leakage from agricultural land into proximate and eventually more remote water bodies is widely seen as the most important source of pollution of the Baltic Sea (HELCOM 2014; Tynkkynen et al. 2014; HELCOM 2015 ) and AES in Sweden have been designed with this firmly in mind (Pihlajamäki and Tynkkynen 2011; Granstedt et al. 2008). This has been formally recognized by the Baltic Marine Environment Protection Commission – Helsinki Commission (HELCOM) when it argues that conventional agriculture practices are responsible for a large share of the leaching

<sup>1</sup> See more information:

[https://www.sh.se/p3/ext/content.nsf/aget?openagent&key=projekt\\_page\\_eng\\_1351162974876](https://www.sh.se/p3/ext/content.nsf/aget?openagent&key=projekt_page_eng_1351162974876)

of eutrophication causing nutrients into the Baltic Sea and a significant impediment to the HELCOM goal of restoring ‘the good ecological status’ of the Baltic marine environment by 2021 (Powell et al. 2012; HELCOM 2007). Among other environmental goals (such as biodiversity conservation and landscape aesthetics), AES are explicitly aimed at changing farming practices to reduce the effects of production on downstream water quality, i.e., to reduce the nutrient content of water flowing off-site; often categorized as watershed protection.

### *The Swedish Agri-environmental Scheme*

Sweden has introduced a range of agri-environmental measures since the late 1980s, when excess nutrient problems in the Baltic Sea became prominent. The Swedish programme has variously included measures to reduce nitrogen, phosphorus and ammonia losses from agriculture. These measures have taken a number of different forms including financial regulation, voluntary approaches, extension programs, information campaigns, as well as research. The CAP Pillar 2 is devoted to promoting rural development and consists of four axes. Axis 2 is dedicated to improving the environment and the countryside. The co-funded AES are the means to deliver this part of the EU rural development agenda. During 2007-2013, Höjgård and Rabinowicz (2014:4) report that €2,702 million was allocated to the Swedish Axis 2. The aim of Axis 2 is to enhance the environment and rural areas by supporting land management (Højgård and Rabinowicz 2014:4) – it puts emphasis on a multifunctional agriculture with agri-environmental payments being the most important measures as a means to achieve this.

The stated priority area for assistance, which is the more intensively farmed area of Sweden, is termed the Nitrate Vulnerable Zone. It comprises all of the arable lands in central and southern Sweden. In addition to the optional AES measures, farmers in this zone must comply with specific action programs, which may include reduced fertilization application levels; requirements on timing of fertiliser application; and establishment of buffer strips near water courses (Amblard 2012).

The Swedish Board of Agriculture has the comprehensive responsibility concerning regulation of the program and for its implementation nationally. The County Administrative Boards (CAB) are responsible for the administration including applications and payments for the various agri-environmental measures, including organic production.

## Emergence of PES and refinement into AES

The concept of Ecological Services (ES) emerged in the 1990s growing rapidly into the 2000s, where it has almost become the dominant policy mechanism used to embed ecological concerns and goals in agricultural policy and practices. During the 1990s, ES was used mostly in scientific papers to express the value of ecological processes to human welfare – to raise awareness.<sup>2</sup> In the 2000s, much of the discussion and activity around ES shifted to its use as a policy measure for payments to specified actors (e.g., producers/farmers/land managers) in exchange for ensuring the maintenance of desirable ecological services to beneficiaries (i.e., the public and various other users, depending on the circumstances). This 2000s use of ES transformed into the institutionalized PES policy mechanisms in different forms that have been applied to a wide variety of settings. This trend was, and still is, associated with a broader perceived need to reconcile ecology and economics through the adoption of market-based approaches that institutionalize demand for and supply of ecological goods and services. Or put in economic terms, PES schemes seek to internalize what would otherwise be an externality (Pagiola & Platais 2007). This approach to policy gained significant traction through the Millennium Ecosystem Assessment (MEA 2005), where it was a mainstay policy mechanism and even more recently in The Economics of Ecosystems and Biodiversity report (TEEB 2009). In general terms, PES schemes thus can be seen as a form of market-oriented environmental governance arrangement that seeks to direct how resources are managed (Corbera et al. 2009).

A typology developed by Pirard (2012) sorts PES schemes into several types based around their characteristics and their relationship to the market. This paper is primarily concerned with AES, defined by Segerson (2013) as a ‘public voluntary program, under which the government unilaterally determines both the rewards from and obligations of participation, as well as the eligibility criteria, and eligible parties then decide whether to participate’ (p.4). The premise of AES is that paying farmers (as the seller or provider) to produce the ecological services for the public good (as the

<sup>2</sup> The Millennium Ecosystem Assessment (2005) report elaborates ecological services to be ‘the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber and fibre; regulating services that affect climate, floods, disease, wastes and water quality; cultural services that provide recreational, aesthetic and spiritual benefits; and supporting services such as soil formation, photosynthesis and nutrient cycling’ (p.v).

buyer) can deliver win/win solutions – food/fodder production with good ecological outcomes. AES are designed to compensate farmers (for costs incurred and income foregone) who undertake ‘costly actions’ that yield environmental benefits rather than pay farmers for the (value of) provision of ecological services *per se* or give farmers incentive payments. The reluctance to adopt an incentive payment approach,<sup>3</sup> at least in the EU, is likely born in part at least over concern that such payment would be seen as farm subsidies and therefore come under scrutiny for contravening free trade rules. Such ‘costly actions’ for farmers include investment in improved farm infrastructure (e.g. improved manure handling facilities), landscaping (e.g., creation for rehabilitation for wetlands) and crop management (e.g., planting of catch crops). It also assumes that farmers have property rights over water (or at least hold some rights to pollute), which then follows (not uncontroversially) that they should be compensated for showing restraint from engaging in polluting farming practices (Lingard 2002).

In the EU, AES are designed and administered differently by member states. AES are regarded as one notable type of PES, where the member state public administration on behalf of society is the purchaser of public environmental goods or services from individual farmers through contractual arrangements (Viaggi et al. 2010; FAO, 2007). The Swedish AES design is described further below. Engel et al. (2008) suggest that PES schemes might be a useful approach where public goods, such as water are seen to be externalities by the farmer, i.e., the provision of ‘clean water for watershed protection’. Also worth noting, in actuality, in many EU cases, AES are not likely to be operating as the only governance mechanism affecting land management for conservation. There are likely to be a co-existing range of policy mechanisms affecting land management, including regulation (incl. cross compliance measures), farm advisory services and AES monetary incentives – whether these measures act in a complementary or reinforcing way or not is an empirical question.

<sup>3</sup> Although PES are still seen by some commentators as subsidies being paid to farmers for reducing water pollution (also related see discussion below on polluters pay principle vs. beneficiaries pay principle). In the EU context, the level of obligation included in AES are supposed to go beyond Pillar 1, cross-compliance measures (part of the Single Payment Scheme) under the CAP. In the above text, I have referred to an incentive payment as that which would be more than the amount of compensation that the farmer would receive for implementing a particular AES measure. Of course some farmers may be incentivised by other factors.



## Key Concepts and Debates

This section of the paper describes and reflects on key debates surrounding PES. Where possible these debates and their implications are related to AES measures designed to reduce agricultural related nutrient run-off – mostly with a Swedish farming context in mind.

### *Simplification of our relationship with nature*

A common critique of PES, as an approach to environmental governance, which has been well noted elsewhere, is that it over-simplifies society's relationship with nature by converting complex social-ecological interactions into a monetary value. Some commentators, who dismiss PES completely, argue that nature's intrinsic value is beyond putting a price on – it is literally priceless (McCauley 2006). Other strong critics zoom in on different PES scheme presuppositions or premises. For example, George Monbiot (2012) when he states that, 'Payments for ecosystem services extend this encroachment by appointing the landlord as the owner and instigator of the wildlife, the water flow, the carbon cycle, the natural processes previously deemed to belong to everyone and no one' and Muradian et al. (2013) when describing the contradictory logic of PES schemes as 'trying to sell nature to save it' (p. 2).

Using markets for environmental conservation tends to divide the conservation movement – some seeing it as extraordinarily powerful and others incredibly naïve and dangerous (Dryzek 2013). Wolf (2013) argues that the 'ambition of PES schemes is to 'internalize externalities' – by getting the prices right and creating new markets (assigning property rights to newly imagined and specified concepts in order to make transactions possible)' (p.5). Put this way several layers of simplification are discernible and required for the schemes to come to fruition. Critics question whether we are able to, or indeed should, map and submit ecology (or categories and processes thereof) and indeed human: ecological relations to market calculus. Furthermore, that such efforts stretch technical science's capacity (perhaps beyond its limits) to map and categorize ecological interactions and values, and to nominate and model cause and effect relations over time and space. According to the FAO (2007:10), for AES design to be effective, it is imperative that it is informed by a 'clear understanding of the biophysical relationships between farmers' actions and their environmental consequences'. Furthermore, these scientific data then need to be translated by economists and administrators into administrative schemes that motivate

farmers (in an individual and collective way) to incorporate this broader public interest (clean water) into their production practices. However, the case of eutrophication is largely an invisible problem (to farmers) and involves diverse time lags and uncertainties (Varjopuro et al. 2014), which make the empirical certainty of contexts, causes and processes of eutrophication difficult to discern – even without the step of governance arrangements through pseudo-market mechanisms such as AES.

*Thinking about externalities and mending market failure*

In market thinking, the argumentative rationale for PES simply put is, ‘we don’t look after what we don’t pay for’ or similar. Accordingly, proponents of PES argue that these schemes address the shortcomings of existing markets, which seldom reflect the full social/environmental cost of production. The assumption underpinning this view in an agricultural context is that it is not economically rational to consider water quality concerns, where these actions do not (directly) affect farming production/productivity. Therefore AES aim to compensate producers for undertaking actions to maintain environmental services that are seen to deliver public or remote user benefit (such as clean water in our case). AES provide a means to internalise these costs into the production process. This is done by compensating producers (approximately) for ‘additional costs’ incurred in assisting the delivery of the desired ecosystem service. Latacz-Lohmann & Van der Hamsvoort (1998) assert that such schemes are needed because ‘some institution other than a conventional market is needed to stimulate the provision of public goods from agriculture to reduce the public good nature of ecological services that has tended to lead to free-riding’ (pp.334–335). AES are seen to be a more effective policy response than command and control (read regulatory, where compliance is mandatory) approaches to environmental management in agricultural settings for several reasons including: their voluntary character is likely to make them less politically contentious as a policy measure; the lower institutional costs related to implementation, monitoring and enforcement (this is difficult due to the diffuse character of water pollution); and because farmers, depending on the AES design, may be given increased flexibility to exercise more innovation (exercising the benefits of local knowledge) in delivering the outcomes sought. Environmental taxes, say on fertiliser (i.e., aimed at reducing nitrogen use and therefore leaching), could also be an option as they internalize costs that otherwise would not have been included in the economic decision-making process of farmers. It has been suggested that

taxes are likely to be politically controversial. This is illustrated in the Swedish case where taxes were introduced on nitrogen-based fertilisers, which resulted in decreasing fertiliser use, but were subsequently abolished in favour of AES and others means.<sup>4</sup>

AES, as described above, are underpinned by a 'Beneficiaries Pay Principle (BPP)'<sup>5</sup>. Some commentators have observed that this reverses the 'Polluter Pays Principle' (PPP)<sup>6</sup> (Hanley et al. 1998; Pirard et al. 2010), so that farmers are not seen as polluters if they, for example, cause water contamination problems, but potential providers of a service, i.e., in this case as providers of 'clean water'. So what is the appropriate policy approach: to punish polluters or to pay providers? Van Hecken & Bastiansen (2010) answer that this depends on whether externalities are seen as positive or negative which in turn relates to the context of what is socially acceptable behaviour in terms of farming practice in the particular context being considered. Furthermore, as Van Hecken & Bastiansen (2010) observe, the social imperative of the duty-of-care principle partially substitutes for an approach based upon the internalisation of externalities, as it makes little sense to provide monetary incentives for what is regarded to be a social obligation. So in this view, farmers should be punished by society if management falls below the socially desirable level and rewarded if their management produces benefits above the minimum duty of care (Van Hecken & Bastiansen 2010). In this context, as Amblard (2012) notes 'the Nitrate Directive is consistent with the PPP while with the AES, the BPP prevails' (p.4), because actions under the AES are seen to go beyond a minimum duty of care. The seemingly arbitrary demarcation in application in Sweden between these two approaches is remarkable in some ways given that the widely acknowledged extent of the diffuse eutrophication problem. It must be attributed to historical and political context rather than any ecological reasoning. This discussion suggests both empirical and normative questions need to be asked when examining AES in practice.

<sup>4</sup> Ahodi and Svatonova (2014) claim that a fertilizer tax in Sweden 'reduced demand for fertilizer in 1991–92 by 15–20% and also financial optimal dosage by 10%' (p.77). According to Bragadóttir et al. (2014:135), this tax was subsequently withdrawn in 2010 to make Swedish agriculture more competitive.

<sup>5</sup> Which has been also called the Victim Pays Principle. This is where the 'victim has to pay by enduring a degraded environment, or by cleaning up, or by subsidising the polluter to clean up or change methods' (Convery and Scott 1997: 2)

<sup>6</sup> Environmental taxes are consistent with the PPP.

*Creating enduring institutions for behavioural change*

While the literature is equivocal on whether AES lead to more embedded and enduring desired behavioural change among producers, there is growing evidence that indicates that non-economic factors are highly influential in affecting farmers sustained participation in PES (van Hecken & Bastiansen 2010; OECD 2012; Muradian et al. 2013; Powell et al. 2012; Saunders 2015). These findings reflect the rather limited literature in regard to the roles of moral concerns and social norms as behavioural incentives in PES schemes (Wolf 2013). Several studies have also found that despite long-term engagement with voluntary agricultural programs there is little evidence to support changes to farmers' attitudes regarding lasting and profound environmental practices (Muradian et al. 2013; Pattanayak et al., 2010; Kerr et al. 2013). It has also been argued that AES tend to shore up the financial viability of conventional (big) farming rather than embed practices for more sustainable pathways. Furthermore, AES can even impede innovation as standardised or prescriptive practices related to action objectives are implemented. Other studies which contradict these findings argue that long-term engagement with such programs can foster a duty of care or greater intrinsic motivation towards the environment (Burton and Paragahawewa 2011). While other research is more nuanced about the possible benefits of 'attitudinal change' and discuss how measures that require 'more substantial changes' to the institutional arrangements of farming practices are likely to lead to enduring changes (Wilson and Hart 2002; Wolf 2013). It has also been suggested that those who enrol in AES are likely to already have a positive conservation inclination – therefore such schemes are unlikely to instigate widespread and lasting reform in areas where farmers have indifferent attitudes towards conservation or where farming practices are causing environmental problems (Saunders 2015). Not unsurprisingly, Kerr et al. (2013) found that both 'economic incentives and social norms variables help explain the contribution behaviour of individual AES participants' (p.1). It has been suggested, however, that monetary incentives may 'crowd out' socially derived sources of motivation (Kerr et al. 2013). This point is similar to Ostrom's (2000) arguments around CPRs, if monitoring and enforcement become social rather than regulatory acts it is more likely that these behaviours will become 'normalised'.

A number of studies reviewed suggest that local institutions and group identity are important in developing 'pro-environmental' behaviour in the longer term (if it is consistent with farm productivity), even if PES schemes

are withdrawn (Van Hecken & Bastiansen, 2010). Long-term empirical evidence from the Landcare<sup>7</sup> initiative in Australia is more equivocal on this point. Findings suggest that farmers, regardless of other factors, are much more likely to take up conservation practices if those practices are economically profitable (Cary and Wilkinson 1997). That said, schemes, such as Landcare, may foster capacities among farmers that are conducive to the acceptance of sustainable farming practices,<sup>8</sup> which may increase farmers receptivity to change behaviour under circumstances where conservation practices become more favourable (e.g. ‘where it is evident there is a direct connection between production practices and land degradation on their own land or through demand driven factors such as growing market demands or increased price margins for organic produce’).

Another strand of critique elaborated by Burton & Schwarz (2013) is that PES schemes can stymie innovation if they are too prescriptive or seek to overly standardise actions (rather than placing focus on ecological outcomes). This may be important to note as many EU funded AES are activity-based. That is, payment is given in exchange for meeting activity-based outcomes, such as constructing a wetland. Clearly the advantage of this approach is that it is relatively easy to monitor and measure. The nub of the critique against a standardised approach is that implementing standardised responses reduces possibilities to innovate through trial and error in situ and through this process develop novel knowledge and conservation approaches suited to local conditions. Attendant to this argument are questions about whether standardised knowledge facilitated by extension work becomes embedded in a local cultural context given that it comes as disembodied knowledge not derived through experience associated with localised conditions and social relations. This argument has been well made elsewhere in the ICDP and CBNRM literature (see Saunders 2011; Saunders 2014). In light of this discussion a research question to pursue may be: *What are the implications of the interplay between norms, incentives and notions of productivity for farmer decision-making about environmental practices?* (cf. Saunders 2015).

<sup>7</sup> Lochie (2001) defines Landcare as, ‘a government program designed to encourage people to form community Landcare groups with the purpose of addressing local environmental problems in a cooperative and coordinated manner’ (p.244).

<sup>8</sup> Compton and Beaton (2012) suggest that Landcare’s role has been more important as a driver of the creation of social capital in rural communities rather than as an instigator of widespread environmental behavioural change among farmers.

*Win-win or Trade-offs?*

PES schemes have been characterised as both win/win and trade-off type environment/conservation policy mechanisms. This section discusses the assumptions, content and implications of these two seemingly incompatible<sup>9</sup> views as they relate to PES in the context of the broader debate between conservation and development. Wunder (2005) argues that PES schemes, ‘instead of presupposing win-win solutions, explicitly recognise hard trade-offs in landscapes with mounting land-use pressures, and seeks to reconcile conflicting interests through compensation’ (p.1). Others see PES as win/win policy mechanisms that recognise the value of private land and land-use that generates a considerable amount of ecosystem services (Osbeck et al. 2013). Win-win descriptions of projects are commonly used by PES advocates to describe the simultaneous achievement of positive environmental (public benefits/social goals) and economic outcomes for producers (private goals). Arguably this is often done in a way that does not take into consideration the possibility of conflict and contradiction within environmental goals (i.e., between ecological services), between conservation and other social goals and between farmer and environmental goals (Howe et al. 2014). Kumar and Thiaw (2013) make the point that most PES schemes are designed so that conservation benefits accrue at local scales or in situ. Despite this, PES schemes are being directed at addressing conservation problems at much larger scales, e.g., in large catchment areas with water passing through agricultural landscapes flowing via catchments into the Baltic Sea. From the outset the design of PES schemes require to seriously consider why trade-offs occur, which may increase the likelihood of ‘win-win’ synergies (Howe et al. 2014; Arriagada and Perrings 2009:7). Despite the abundant policy writings promoting synergies, difficult choices between conservation and development are common (McShane et al. 2011). In such situations, it is abundantly more common in PES/AES applications that trade-offs will need to be made that preference one course of action and goal over another,<sup>10</sup> ‘between conflicting interests, between different time horizons and the distribution of costs and benefits at different scales’ (ACSC 2011:9; Power 2010; Howe et al. 2014).

<sup>9</sup> Others see trade-offs leading to possible win/win outcomes (see Rodríguez et al. 2006).

<sup>10</sup> e.g., planting crops to increase production or providing bird habitat or employing a fallow system of farming.

*Equity*

With the dearth of writings on PES schemes and equity (particularly those focused on empirical examples from the Global South, there is growing awareness and understanding that fairness affects the political and social legitimacy, and effectiveness of PES in practice (Narloch et al. 2013). Developing this insight, Fuentes-George (2013) argues that:

‘commodifying nature undermines other perspectives on the value of nature, notably those rooted in cultural, historic, subsistence and aesthetic paradigms thereby marginalising those not integrated into major economic markets to participate in governance and influence what “effective” regime implementation looks like at the local level’ (Abstract).

While it may be unusual in a Global North country context to explicitly integrate equity goals in PES, in developing the Global South however, socio-economic goals, including poverty alleviation are often key components of PES schemes (Wunder 2008). Equity perceptions of PES schemes are likely to be affected by scheme accessibility, ability of the actors potentially affected to influence scheme design/process and payment distribution (and amount)<sup>11</sup> (McDermott et al. 2013; Narloch et al. 2013).

To some extent, equity concerns could already be seen as being integrated into AES as transfers are made to farmers who are seen to ‘unfairly’ incur the socio-environmental costs of growing produce and ensuring the maintenance of environmental qualities both on and off site (incorporated into the beneficiary pays principle). This implicit focus on equity however may be offset by policy concerns to maximise the efficiency of such schemes to deliver environmental outcomes (e.g. through reverse auctions or targeting hotspots) (see Narloch et al. 2013). Aside from the ethical considerations of examining the relationship between AES and equity/fairness, from a policy take-up perspective farmers are the actors that agree to AES related contracts and are ultimately responsible for the implementation of contracted agri-environmental practices. Perceptions of the equity of AES should be important to policy-makers and others as they are likely to affect the viability of such schemes.

<sup>11</sup> The amount of payment to ‘compensate’ farmers has been examined in the BSR by the Baltic Deal research project (Powell et al. 2012). The findings indicated concern differential compensation available to farmers in different countries due to different condition of access to EU funding for accession countries (Powell et al. 2012).

*Relationship between Common Pool Resources and AES*

AES are individualised arrangements between the farmer and the State, at least in the Swedish context. The collective and dispersed character of the water pollution problem pose challenges about how to bring about a critical threshold of behavioural change among farmers so that it positively affects water quality outcomes – fragmented participation is unlikely to achieve positive outcomes. Water in the agricultural context is rival and non-excludable – therefore fulfilling the two essential criteria that defines a common pool resource (CPR). Fisher et al. (2010) advise us that ‘CPRs are systems or resources that deliver services or benefits to people, while ecosystem services are the processes of ecosystems that deliver benefits’ (p. 1254). These insights suggest there may be lessons from the CPR literature which may help to understand AES and its relationship to farmer behaviour (Clements et al. 2010). The complex character of diffuse nutrient leakage from agriculture suggests that the path for change may lie in enabling collective action in response to measurable localised catchment problems (FAO 2007). From a catchment management perspective, efforts to reduce fertiliser leakage must be provided at a sufficient level at the scale of the catchment to attain desired objectives. Kuhfuss et al., (2016) in a French context, reports on an approach to AES design called ‘collective conditionality’, which is a measure to attain a collective threshold of environmental efforts in a catchment area. In this approach, individual agri-environmental contracts are coupled with specific bonus incentives that are only available if a minimum level of participation catchment-wide is met. Application of AES in this form would need to be measurable and performance-based to show that production efficiencies and water quality goals are compatible and can be achieved simultaneously (McGuire et al. 2013). This would make visible the environmental benefits of farmer actions (or vice versa) in a localised context (i.e., local catchment in the case of water pollution). Certainly ‘the CPR theory literature shows the possibilities of galvanising small-scale collective action around environmental problems’, (Ostrom 2000). However building such collective action is not without its challenges particularly in relation to demonstrating that the effort (to develop rules, build trust, monitor and sanction) would be worth the collective benefit.<sup>12</sup> Aside from this, there is also considerable uncertainty

<sup>12</sup> Lundqvist (2004) argues that in the Swedish context, this is trying to be done under the EU Water Framework Directive by setting up farmer collective action around eutrophication mitigation in localized catchment organizations called ‘joint property water management associations’.



about the degree to which farmer norms may hinder behavioural change (Saunders 2015) even in the face of monetary incentives, designed in a two stage payment arrangement. Additionally, given that the adverse effects of nutrient leakage are likely to occur remote from the farm source, demonstrating mutual benefit would not be straightforward, even with ‘collective conditionality’. That said, it is clear that lessons from CPR management research may be able to generate insights for PES implementation, particularly around how to garner collective action.

## Conclusion

Despite the increasingly critical stance towards PES, particularly among some sections of the scholarly community and environmental movement, they are immensely popular and even some strident critics, such as Wolf (2013), are mildly optimistic of the future of PES schemes. This is evident when he observes that overly-simplified conceptions of PES schemes, like shifts in ecological modernisation thinking, ‘are giving way to richer, more encompassing, integrated questions and designs’ (Wolf 2013:5). This background paper has introduced a number of design characteristics and concepts underpinning PES schemes with a focus on AES. AES are part of a growing movement to apply monetary values to aspects of ecological interactions and to use market principles as a means of environmental governance. As such they have been subject to a more general critique that questions the appropriateness and effectiveness of the converting complex ecological values and processes into monetary terms (although it is doubtful whether most PES schemes actually do this – at least not directly) to enact individualised behavioural change and deliver sustainable outcomes (Muridian et al. 2013). Counterarguments stress that in order to move towards sustainability we need to further integrate economic and environmental concerns and that PES schemes by offering economic incentives can result in more efficient ways to achieve this than regulatory approaches.

This paper has touched on a number of contentions in the PES literature, including: doubts about how well standardised PES schemes link with local conditions; how and whether PES schemes can engender local innovation; procedural and distributive equity concerns; claims that monetary incentives may ‘crowd out’ socially derived sources of motivation (local norms); and doubts about whether PES schemes, disembedded from local

institutions, can deliver ‘sufficient’ environmental behavioural change. Given the relatively recent emergence of AES, it is important that we learn more from the experience of implementation. This type of research then has the capacity to work as a circuit breaker between ideologically driven arguments that side either for or against the use of market mechanisms, such as AES for environmental governance. Much of the discussion in this paper relates to gaining a better understanding of the localised social implications of AES. The assumption being that a better grasp of the practice of AES will lead to a greater understanding of the behavioural implications of paying farmers to contribute to the water conservation measures. To this end, theoretically informed empirically-based insights of farmer perceptions of AES have the potential to generate improved understanding and knowledge of how to better ground AES in different contexts.

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