



## Payments for Ecosystem Services

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### Editorial

## Enhancing the effectiveness of Payments for Ecosystem Services (PES)

Biodiversity and ecosystems provide many critical life support functions and benefits for human wellbeing, security and economic growth, including food, clean water, recreational services and climate regulation. Despite its significant values, biodiversity worldwide is being lost, in some areas at a rapid rate.

Given these losses, there is an urgent need for firstly, greater application of policies and incentives to promote the conservation and sustainable use of biodiversity and ecosystem services, and secondly, a more efficient use of available finance in existing biodiversity programmes. PES is a flexible, incentive-based mechanism that has potential to deliver in both of these areas. This Thematic Issue of *Science for Environment Policy* explores research which can help guide effective PES schemes. Under PES agreements, a user or beneficiary of an ecosystem service provides payments to individuals or communities whose management decisions and practices influence the provision of ecosystem services.

Research suggests that PES schemes could play a more prominent role in linking public and private efforts to protect biodiversity and ecosystem services, both in the EU and globally, as demonstrated in the article '**Sustainable funding for global ecosystem services: new system proposed**'. Lessons from common pool resource management (CPR) for PES can be found in the article, '**Can common pool resource management aid PES implementation?**' which found that six sustainable management characteristics from CPR will also have lessons for PES.

Over the past decade, PES programmes have proliferated rapidly. Experience and lessons learned from these applications provide valuable insights for improving PES design and implementation

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– see for example: **‘Learning from Ecuador’s national conservation incentive scheme’**. Similarly in Europe, a UK case study of a PES scheme for farmers highlights the important role of neighbours in uptake of a scheme: **‘Neighbours can influence farmer participation in PES schemes’**. Other case studies worth reading include a report<sup>1</sup> on the valuation of natural capital and subsequent application of a PES scheme in Nepal, which suffers an acute water scarcity.

Key criteria that are needed to enhance PES effectiveness include (OECD, 2010<sup>2</sup>):

1. Removing perverse incentives: For a PES programme to produce effective incentives, conflicting market distortions, such as environmentally harmful subsidies, should be removed.
2. Clearly defining property rights: The individual or community whose land use decisions affect the provision of ecosystem services must have clearly defined and enforceable property rights over the land.
3. Clearly defining PES goals and objectives: These help to guide the design of the programme and enhance transparency.
4. Developing a robust monitoring and reporting framework of biodiversity and ecosystem services.
5. Identifying buyers and ensure sufficient and long-term sources of financing. The article **‘How to attract PES investment from private business?’** examines how much private companies are prepared to invest in PES schemes for tropical forests and what can be done to motivate them.
6. Identifying sellers and target ecosystem service benefits: Accounting for spatial variation in ecosystem service benefits via economic valuation, benefit scoring, and mapping tools allows payments to be prioritised to areas that provide the highest benefits. If the PES budget is limited, this can substantially increase the cost-effectiveness of the programme.
7. Establishing baselines and target payments to ecosystem services that are at risk of loss, or to enhance their provision: A PES programme should only make payments for ecosystem services that are additional to the business-as-usual baseline.
8. Differentiating payments based on the opportunity costs of ecosystem service provision: PES programmes that reflect the cost of an alternative action that must be avoided (e.g. deforestation) so as to enhance ecosystem service provision, are able to achieve larger ecosystem service benefits per unit cost.
9. Consider bundling or layering multiple ecosystem services: Joint provision of multiple services can provide opportunities to increase the benefits of the programme, while reducing transaction costs. This is clearly demonstrated by the article **‘Bundled’ PES schemes to boost cost-effectiveness’**.

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10. Addressing leakages: Leakage occurs when measures to enhance ecosystem services provision in one location leads to increased pressures for conversion in another. If leakage risk is expected to be high, the scope of the monitoring and accounting framework may need to be expanded so as to detect, and consequently address, leakage.
11. Ensuring permanence: Events such as forest fires may undermine the ability of a landholder to provide an ecosystem service as stipulated in a PES agreement. If the risks are high, this will impede the effective functioning of a PES market.
12. Delivering performance-based payments and ensure adequate enforcement: Payments should be ex-post, conditional on performance. When this is not feasible, effort-based payments (such as changes in management practices) are a second best alternative, provided that changes in ecosystem management practices will bring about the desired change in service provision.

The importance of stakeholder inputs for the design and implementation of PES are demonstrated in **'Future agri-environmental schemes need co-ordinating across landscapes'** as well as the need to develop tools and policies for improving PES design. The article 'An alternative conceptual framework for 'Payments for Environmental Services' on offer' describes a framework, incorporating the social aspects of PES, which can be used by practitioners, such as governments, to design and implement a variety of PES schemes.

At a global level, PES is prominent in the discussions under the Convention on Biological Diversity on resource mobilisation for biodiversity<sup>3</sup>. One such mechanism is the potential role of REDD+<sup>4</sup> in providing biodiversity co-benefits.

Recognised as an important implementation tool, the role of PES schemes has been promoted in the EU Biodiversity Strategy to 2020<sup>5</sup>, and their potential is further highlighted in the Roadmap for a Resource Efficient Europe (COM(2011)57)<sup>6</sup>. Regarding Parties' commitment under the Convention for Biological Diversity to substantially increase financial resources from all sources, the Strategy recognises the need for increases in public funding, but also the potential of innovative financial mechanisms, including PES. There are ongoing reforms within the EU where PES can play an important role, in particular, agri-environmental schemes in the CAP (Common Agricultural Policy) reform and similar support payments in the proposed European Maritime and Fisheries Fund. The establishment of Green Infrastructure is another area where PES could potentially play a role.

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<sup>1</sup> Navraj P *et al.* 2010. Valuing Water and its Ecological Services in Rural Landscapes: A Case Study from Nepal. *Mountain Forum Bulletin*. ICIMOD, Nepal.

<sup>2</sup> OECD, 2010. Paying for Biodiversity: Enhancing the Cost-Effectiveness of Payments for Ecosystem Services. OECD Publishing.

<sup>3</sup> See: <http://www.cbd.int/financial/mobilization.shtml>

<sup>4</sup> See: <http://www.un-redd.org/AboutREDD/tabid/582/Default.aspx>

<sup>5</sup> See: <http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm>

<sup>6</sup> See: [http://ec.europa.eu/environment/resource\\_efficiency/index\\_en.htm](http://ec.europa.eu/environment/resource_efficiency/index_en.htm)



## New system of sustainable funding for global ecosystem services

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**Theme(s):** Biodiversity, Climate change and energy, Environmental economics

“Brazilian states return 25% of revenue from sales taxes to the municipalities. Some states use this to pay for ecosystem services.”

Researchers argue that of the five mechanisms available for ensuring the provision of ecosystem services – prescription, penalties, persuasion, property rights and payments – only payments are likely to be effective at the global level. However, while a number of international Payments for Ecosystem Services (IPES) schemes exist, their impact on ecosystem services remains negligible.

The authors suggest that since climate change and pollution (including from fossil fuels) are some of the major threats to biodiversity, auctioning off carbon caps or taxing greenhouse gas emissions can simultaneously help stabilise the global climate while providing funds for global biodiversity and ecosystem services PES schemes.

More specifically, they argue that a cap and auction carbon trading scheme should be open to the relatively few countries that are responsible for around 90% of global emissions. To distribute the funds, the researchers recommend a system modelled on Brazil's ICMS Ecológico<sup>2</sup>, which they consider cost-effective and successful. Under this intergovernmental fiscal transfer system, Brazilian states return 25% of revenue from sales taxes to the municipalities. Some states use this to pay for ecosystem services. For example, the state of Parana awards 5% of this revenue each year to municipalities in proportion to their protection of watersheds and conservation areas. This has created incentives for municipalities in Parana to develop well-managed protected areas, especially as only the best efforts are rewarded, so municipalities in effect compete with each other for the funds.

Adapting this system to an IPES scheme would involve the carbon trading scheme allocating its annual revenues as payments to ecosystem service ‘providers’ (countries, states/regions or municipalities) in proportion to the quantity and quality of ecosystem services provided. Criteria for ‘quantity’ and ‘quality’ should be set at the global level by experts in biodiversity, landscape and ecosystem services management, who should also assess, monitor, report and verify the provision of ecosystem services.

As has been the case for the ICMS Ecológico, criteria can be simple in the initial stages but improved over time as data and information improves. They argue that whatever approach is taken, payments should target bundled services as this can be substantially more cost-effective. For example, while targeting forest conservation based solely on carbon sequestration can also improve biodiversity conservation, targeting both carbon and biodiversity together significantly increases the total ecosystem service benefits, at a very low additional cost.

**Source:** Farley, J., Aquino, A., Daniels, A. *et al.* (2010). Global mechanisms for sustaining and enhancing PES schemes. *Ecological Economics*. 69(11): 2075-2084.

<sup>1</sup> See: [www.thegef.org](http://www.thegef.org)

<sup>2</sup> See: [www.icmsecológico.org.br](http://www.icmsecológico.org.br) [in Portuguese]



## Can common pool resource management aid PES implementation?

The design and implementation of Payments for Ecosystem Services (PES) schemes could benefit from lessons learned from the management of common pool resources (CPR). By examining previous research into CPR, an international team of researchers has demonstrated that six sustainable management characteristics of CPRs also hold lessons for PES practitioners.

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“In Tanzania, there is little systematic monitoring of river catchment areas, and the institutional links between downstream water use and upstream catchment management need to be greatly strengthened.”

Ecosystems are described as Common Pool Resources when it is hard to stop people using them, and when one person's use reduces the resource available for others. The environmental systems that provide ecosystem services, such as forests, catchments or fisheries, are often CPRs. PES schemes are designed to support the delivery of ecosystem services from such systems, so the considerations relevant for managing CPRs sustainably could also help the design and implementation of PES schemes.

To explore the similarities between PES schemes and CPRs, the researchers analysed six characteristics for successful CPR management from previous research and applied these to existing PES activities. Insights were then used to look at two case studies where the Tanzanian government and others have been considering how to implement PES schemes in two river basins.

Three of the CPR characteristics focus on the resource size, the user community, and the user-resource relationship. Previous CPR studies found that smaller resources with well-defined boundaries are easier to manage, as are smaller user groups. The same applies to PES: in the Tanzanian studies, PES applied to very large river catchments (50,000km<sup>2</sup> and 175,000km<sup>2</sup>) and diverse user groups spread over a large geographic area that make it difficult to manage the PES schemes. As a result, the researchers suggest PES in these two basins could be managed better at a sub-catchment scale.

CPR management also works well when the users are close to the resource, and are highly dependent upon it. For PES, when users are distant from the service provider, as is the case in many river catchments, it is important to verify the effectiveness of PES so users can understand the benefits they receive from the resource.

The next two characteristics explore institutional arrangements and interactions between these and the resource. Any governance arrangements for CPRs must be clear and seen as fair by users. This suggests contracts for PES should be awarded transparently, and any rules should be agreed collectively with user communities to ensure social acceptance.

The relationships between institutional arrangements and the resource are also important. Institutions governing PES schemes need to understand the system in question and demonstrate to policy makers and users of the resource the effectiveness of the scheme through successful monitoring. In Tanzania, there is little systematic monitoring of river catchment areas, and the institutional links between downstream water use and upstream catchment management need to be greatly strengthened.

Finally, the external environment can also play a role in CPR management. Changing global resource demand, new technologies, and political shifts can all affect the effectiveness of both CPR management and PES schemes.

Source: Fisher, B., Kulindwa, K., Mwanyoka, I., Turner, R. K., & Burgess, N. D., (2010). Common pool resource management and PES: Lessons and constraints for water PES in Tanzania. *Ecological Economics*. 69: 1253-1261.



## Learning from Ecuador's national conservation incentive scheme

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“Large proportions of the money received as incentives by communities are invested in ‘productive activities’, such as agroforestry, agriculture and ecotourism, control of conservation areas, including employing forest rangers and resolving land disputes, health and education.”

Payments for Ecosystem Services (PES) schemes offer direct payments for communities and individuals in exchange for conserving areas of land reserved for conservation for their environmental qualities. The results of an Ecuadorian study highlight key aspects for designing successful PES schemes and demonstrate how investments associated with PES can also benefit poor communities

Until 2000, Ecuador was losing parts of its 10 million hectares (ha) of forest at a rate of around 198,000 ha (1.98%) a year. Socio Bosque is a voluntary, government-funded scheme that has been running since 2008. By October 2010, it covered more than 0.5 million hectares of the country's forests. The scheme is based on a system whereby communities or individual landowners receive annual monetary incentives based on the amount of land they agree to conserve. The term of agreement is 20 years and landowners withdrawing from the scheme early must pay back some of the funds they received.

Specifically, the goal of the Ecuadorian conservation incentive programme, Socio Bosque<sup>1</sup>, is to protect over 3,600,000 hectares (ha) of forest and other native ecosystems, thereby conserving globally important biodiversity, reducing greenhouse gas emissions, protecting soils and water, and controlling natural disasters, as well as to increase the income and protect the human capital of the poorest communities of the country. While previous PES schemes designed as a means to jointly incentivise conservation efforts and alleviate poverty have not always been successful, this study suggests that the Socio Bosque programme is attaining both goals.

To obtain the multiple benefits in a more efficient way, spatial targeting methods were applied, using three main criteria: firstly the deforestation threat; secondly, importance for the three ecosystem services and, thirdly, poverty levels. The indicator used for poverty was the unsatisfied basic needs index. To address social equity, payments also differ depending on the size of the land area put under conservation - on average, a smaller piece of land has a higher price per hectare - this aims to ensure a fairer distribution of funds between communities or wealthy landowners, by comparison to families, who enter into agreements over smaller areas (for whom it may be more difficult to set aside land for conservation).

Through investment plans submitted by participants, the researchers were able to analyse how funds are spent. Large proportions of the money received as incentives by communities are invested in ‘productive activities’, such as agroforestry, agriculture and ecotourism, control of conservation areas, including employing forest rangers and resolving land disputes, health and education. Incentives received by individuals or families were mainly spent on food, clothing, education, health, productive activities and conservation.

The researchers say the Ecuadorian model provides an effective way of improving both nature and the welfare of people and believe that it has strong potential for application elsewhere. The government of Ecuador has already been involved in exchanges with several other South American countries interested in developing such programmes.

**Source:** De Koning, F. Aguiñaga, M., Bravo, M., et al. (2011). Bridging the gap between forest conservation and poverty alleviation: the Ecuadorian Socio Bosque program. *Environmental Science & Policy*. 14: 531-542.

<sup>1</sup>: See: [www.ambiente.gob.ec/?q=node/1064](http://www.ambiente.gob.ec/?q=node/1064) [in Spanish]



## Neighbours can influence farmer participation in PES schemes

Understanding the role of neighbourhood networks in encouraging farmers to participate in Payments for Ecosystem Services (PES) schemes is important as this can help to create local patterns of high and coordinated uptake of PES schemes, and thus an impact on ecosystem protection at a wider, landscape level. This is the outcome of a recent UK study, which found that neighbourhood networks were particularly important for small, remote communities.

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“People living in small, isolated communities tend to be close-knit and collaboration with neighbours is common. In addition, in these areas, respected farm advisors have a strong leadership role in encouraging farmers to join the scheme.”

Conservation policies aiming to protect biodiversity include paying local landowners to manage the land in a way that maintains biodiversity, habitats and species. Such policies are most effective at the landscape scale, but financial incentives are typically offered to individual farmers participating in Agri-Environmental Schemes (AES). Successful AES that are also intended to preserve ecosystem services through PES partly depend on understanding what motivates farmers and other landowners to voluntarily participate in such schemes. A high level of participation ensures the connection of large areas working at a landscape level that, taken together, are managed by appropriate and well-designed strategies.

At the local level, the decision of neighbouring landowners to join (or not join) a PES scheme can have a strong influence on whether an individual farmer decides to participate. This study explored one design of AES, the Environmentally Sensitive Area (ESA) scheme in Scotland, UK, using the ‘Hägerstrand geographical model’, which mathematically calculates the distribution of farmers taking up new ‘environmental’ activities. It investigated whether there are any patterns explaining farmers’ uptake across the different designated areas as ESAs in Scotland. A cluster or a high proportion of farmers in an area joining a scheme with a relatively quick rate of uptake is often an indication of a strong neighbourhood effect.

The study found little evidence that positive views and experiences in existing farmer networks within one ESA would be passed onto farmers in other ESAs.

In some of the ESAs, there were very small clusters of high levels of participating farmers, typically living in small communities and in remote areas. People living in small, isolated communities tend to be close-knit and collaboration with neighbours is common. In addition, in these areas, respected farm advisors have a strong leadership role in encouraging farmers to join the scheme. Trust in advisors is especially important where farmers have less access to other sources of information about the schemes, as can be the case in remote areas.

However, farmers on large farms situated close to cities have a wide range of opportunities to find alternative income to agriculture and are therefore less likely to be influenced by collective decision making.

This study suggests that the Hägerstrand model is an effective tool to determine if design of PES schemes adequately account for factors that encourage the widespread uptake of agri-environmental conservation measures among landowners, such as neighbourhood networks.

Source: Source: van der Horst, D. (2011). Adoption of payments for ecosystem services: An application of the Hägerstrand model. *Applied Geography*. 31: 668-676.



## How to attract PES investment from businesses?

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“Surprisingly, non-financial motivations (i.e. human welfare and ecological responsibility) and indirect-financial motivations (i.e. image benefits) were the biggest influences on willingness to invest (WTI) for all ecosystem services.”

A new study has looked at why and how much private sector companies are prepared to invest in Payment for Ecosystem Services (PES) schemes for tropical forests. Understanding companies' motivations and expectations can help develop new sources of funding for PES schemes from the private sector, increasing the area of tropical forest conserved worldwide.

PES schemes can allow companies to pay to help conserve an ecosystem, to ensure that the service they depend on for their business is not at risk of disappearing, to secure access to biological resources, and to demonstrate environmental responsibility. PES schemes to conserve tropical forests are a relatively new concept and little attention has been paid thus far to examine the factors that influence whether or not businesses participate voluntarily.

Using a detailed questionnaire and a complex statistical model, the study compared the hypothetical 'willingness to invest' (WTI) in tropical forest ecosystem services by 60 international and Costa Rican companies. The researchers focused on four ecosystem services: conservation of biodiversity, absorption of atmospheric CO<sub>2</sub> (i.e. carbon sequestration), provision of water quality by filtering, flow regulation and prevention of erosion (i.e. watershed protection), and preserving scenic beauty.

In total, the companies were willing to invest in conserving the equivalent of 878 km<sup>2</sup> per year of forest by purchasing 'certificates of sustainable forestry'. This equated to paying €2.16 million per year for carbon sequestration, €143,000 for watershed protection, €21,900 for biodiversity conservation and €11,500 for scenic beauty.

Costa Rican firms were willing to invest up to 7.5 times more than international companies (per year and per hectare) for watershed protection, biodiversity conservation and scenic beauty, reflecting a greater interest in protecting their national ecosystem services with local benefits. The difference was less pronounced for carbon sequestration, which is more relevant on a global scale.

The results also revealed differences between companies in different sectors, such as higher WTI in consumer companies (consumer staples, discretionary staples and health care) than industrial companies (those active in the energy, materials, industrial and utilities sectors). However, the number of participants in each sector was relatively low, and a greater number could provide more certain results.

Surprisingly, non-financial motivations (i.e. human welfare and ecological responsibility) and indirect-financial motivations (i.e. image benefits) were the biggest influences on WTI for all ecosystem services. Direct financial benefits (i.e. increased income, cost reductions and client demand) had very little influence. However, non-financial and indirect-financial motivations are unlikely to be enough to convince less environmentally-conscious companies to invest in PES, thus the potential financial rewards need to be highlighted as part of any marketing strategy, say the researchers.

In some cases, previous experience of biodiversity projects had a negative effect on WTI, possibly implying ineffective PES projects and strategies in the past. The existence of an independent intermediary between private companies and forest managers to ensure that money is spent in the most effective ways was also an important deciding factor for international firms.

**Source:** Koellner, T., Sell, J. & Navarro, G. (2011). Why and how much are firms willing to invest in ecosystem services from tropical forests? A comparison of international and Costa Rican firms. *Ecological Economics*. 69:2127-2139.



## 'Bundled' PES schemes to boost cost-effectiveness

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"... to operate successfully in the long-term, PES schemes must attract investment from global beneficiaries, national governments or the private sector."

A recent project has developed a method to spatially target payments to areas where multiple ecosystem services, combining biodiversity conservation with carbon and water services, are jointly provided, so as to enhance the cost-effectiveness of the PES scheme. The study focuses on Madagascar, but the method could be applied at the national or regional level in any country.

PES schemes are rapidly becoming a popular policy approach for ecological conservation. However, funding from local communities is typically scarce and to operate successfully in the long-term, PES schemes must attract investment from global beneficiaries, national governments or the private sector. The more cost-effective a programme is, the more likely it will be able to mobilise additional funding.

One approach to maximising cost-efficiency for investors is to identify and target areas where two or more important ecosystem services are highly valued and are jointly at risk of destruction.

To do this, the researchers measured the magnitude of the services provided, and when applicable, the demand or "value" for the service by beneficiaries. Separate maps for biodiversity, preservation of water quality through watershed protection, and carbon sequestration potential were developed and areas of particular importance were given a high 'value' (up to 100%).

The researchers then combined these three maps to identify where areas of importance for biodiversity overlapped with the other two ecosystem services. No specific regions were found where the value of all three services was over 70%, but a large area of land (43,510 km<sup>2</sup> or 32% of the total area considered) existed where the value of each service was at least 40%.

For each km<sup>2</sup> of identified habitat, the researchers multiplied the ecosystem services by an estimate of the probability of deforestation, to assess the areas under most immediate threat of destruction (i.e. probability of deforestation). They then removed the areas with high opportunity costs (i.e. that would make the most profit if they were to be developed), as these would be the least cost-effective for investors. This left 29,343 km<sup>2</sup> of habitat identified as appropriate for cost-effectively targeting PES schemes.

The authors note that in addition to identifying spatially where PES is a potential conservation strategy it is also necessary to determine whether the capacity and willingness to implement and monitor these types of programs exists. Some of the conditions needed for the PES approach to be effective include appropriate property rights, policy coherence among institutions, political will, engagement and education of stakeholders, and sustainable funding.

**Source:** Wendland, K.J., Miroslav, H., Portela, R. *et al.* (2009). Targeting and implementing payments for ecosystem services: Opportunities for bundling biodiversity conservation with carbon and water services in Madagascar. *Ecological Economics*. 69: 2093-2107.



## Agri-environmental schemes need co-ordinating across landscapes

According to a recent viewpoint article, future agri-environmental schemes (AES) can more effectively pay for the provision of ecosystem services at a landscape level if they are prepared, designed and implemented in a collaborative and coordinated manner.

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Themes: Agriculture, Environmental economics

“Large-scale management of ecosystems is challenging, not least because of the collaboration required to coordinate (across many areas) the actions of all stakeholders, including land managers, government bodies, experts, policymakers and members of the public.”

Certain ecosystems must be managed at the landscape scale, rather than at the local or farm scale, to optimise the provision of ecosystem services, such as freshwater and habitats for a wide range of biodiversity.

Current agri-environmental schemes (AES) that compensate farmers for managing land in an environmentally friendly way are typically targeted at the local level of management. This often results in uncoordinated actions across the landscape level. This article argues that, to be more effective, future AES must be planned, designed and implemented at landscape scale. It presents its viewpoint based on insights from a range of participatory agri-environmental policy making, spatial planning and collaborative approaches to environmental management around the world.

Large-scale management of ecosystems is challenging, not least because of the collaboration required to coordinate (across many areas) the actions of all stakeholders, including land managers, government bodies, experts, policymakers and members of the public. Difficulties arise from the lack of collaboration across different areas and, for example, when collaboration is voluntary rather than underpinned by legislation, which can result in lower levels of commitment from those involved. In addition, mistrust between groups of stakeholders can hamper effective collaboration.

A key element of future AES is participation by all stakeholders. New programmes should incorporate local knowledge, in addition to expert views, to build trust and to encourage acceptance of the schemes. AES are more likely to succeed if stakeholders are included in the discussions and negotiations from the beginning.

Schemes need to be evaluated. Evidence for the impact of the schemes should be decided in advance, appropriate monitoring schemes should be developed and information collected across all relevant scales of management. However, if the chosen indicators perform inadequately, they should be reconsidered. Compliance with the scheme will be increased if land managers agree with the way the indicators are selected and measured.

Sufficient funding is needed for the collaborative programmes and is as central to the success of the schemes as payments to the farmers. However, to ensure farmers join the scheme and are willing collaborators, payment levels to farmers need to be high enough to compete with other opportunities for land use and other sources of income available to farmers.

Moreover, the design and implementation of future programmes should incorporate feedback mechanisms that support the flow of communication among all groups of stakeholders, especially the views from the grassroots level. Close relationships created across all management levels will enhance the ability of ecosystems to provide essential services. Overall, they propose a rethink of the design and implementation of payments for agri-environmental services that encourage collaborative management and focus on process as much as outcomes.

Source: Prager, K., Reed, M., Scott, A. (2012) Encouraging collaboration for the provision of ecosystem services at a landscape scale - Rethinking agri-environmental payments. *Land Use Policy*. 29: 244-249.



## Alternative framework for payments for environmental services on offer

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**Themes:** Biodiversity, Environmental economics, Land use

“Payments for Ecosystem Service (PES) are given to Brazilian Amazonian populations for using ancestral land management practices. However, the communities who receive the payments would continue to use ancestral practices even without an economic incentive.”

An international group of researchers has proposed a new way of describing payments for environmental services (PES). The new definition supplies a framework, incorporating the social aspects of PES, which can be used by practitioners, such as governments, to design and implement a variety of PES schemes.

Until now, PES schemes have been thought of in terms of Coasean economics which argues that, as long as property rights are clearly defined and transaction costs are low enough, bargaining between the parties will achieve the most efficient economic outcome. Based on this viewpoint, three conditions that PES schemes must meet have been identified: the link between land use and ecosystem service must be clear; the transactions must be voluntary; and there must be a monitoring system to ensure the service is being delivered.

However, in reality, PES schemes do not always meet all these conditions. For instance, when a land manager is paid by the state to improve water quality, consumers may not be aware that their water bills are slightly higher to pay for this; hence the transaction is not voluntary (at least from the buyers' perspective).

To address this, the researchers propose an alternative definition, which states that 'PES is the transfer of resources between groups to create an incentive to align land use decisions with the wider social benefits of managing natural resources to provide an ecosystem service'.

They argue that this definition describes more appropriately the existing variety of PES schemes than the Coasean economics framework, and allows PES schemes to be analysed according to three criteria.

The first of these is the relative importance of the economic incentive in influencing land use decisions and thus ecosystem service provision. For example, PES are given to Brazilian Amazonian populations for using ancestral land management practices. However, the communities who receive the payments would continue to use ancestral practices even without an economic incentive. In this case, social and cultural motivations take precedence over economic concerns in establishing land use practices.

The second criterion, directness of transfer, refers to the extent to which individual providers receive direct payments from the ultimate beneficiaries of the service. Often there are intermediary organisations involved in PES transactions between several land owners and consumers. In some cases landowners do not receive individual payments, but instead receive an indirect payment, such as investment in public goods.

Finally, the degree of commodification refers to the extent to which the service being provided can be assessed in measurable quantities. In many PES schemes, the commodity being traded is based on actual inputs and assumptions about the relationship between land use and provision of ecosystem services, rather than on measurable outputs directly.

**Source:** Muradian, R., Corbera, E., Pascual, U., Kosoy, N., & May, P.H. (2010). Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services. *Ecological Economics*. 69: 1202-1208.



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## **New to Science for Environment Policy**

### **Research Repository**

A new online database which brings together key environmental research for evidence-based policy. Free to access, the Research Repository lists studies that have undergone a rigorous selection process to ensure that only high quality, policy-relevant research is featured. The resource will grow as new research becomes available.

Studies are catalogued by topic, across an extensive range of policy themes, from ecosystem services to ecolabelling, and from soil management to urban water management. This is designed to help ensure that individual policymakers can find studies that are relevant to their specific project.

**See: [http://ec.europa.eu/environment/integration/research/newsalert/research\\_repository/research\\_repository.htm](http://ec.europa.eu/environment/integration/research/newsalert/research_repository/research_repository.htm)**

### **Future Briefs**

Future Briefs are a new series of policy briefs, which provide an accessible overview of emerging areas of environmental science and technology.

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