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 – 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 [1] 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[2]):

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) to 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**'.

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 [3]. One such mechanism is the potential role of REDD+ [4] 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[5], and their potential is further highlighted in the Roadmap for a Resource Efficient Europe (COM(2011)57) [6]. 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 areas where PES could potentially play a role.

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1. Navraj P *et al*. 2010. Valuing Water and its Ecological Services in Rural Landscapes: A Case Study from Nepal. *Mountain Forum Bulletin*. ICIMOD, Nepal.
2. OECD, 2010. Paying for Biodiversity: Enhancing the Cost-Effectiveness of Payments for Ecosystem Services. OECD Publishing.
3. See: http://www.cbd.int/financial/mobilization.shtml
4. See: http://www.un-redd.org/AboutREDD/tabid/582/Default.aspx

5. See: http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm
6. See: http://ec.europa.eu/environment/resource_efficiency/index_en.htm