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Developing International Payments for Ecosystem Services: A Technical Discussion

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Background paper

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The edition of the background paper was commissioned by UNEP, and was designed as a complement to the ongoing discussion on the development of international payments for ecosystem services. It is therefore still a 'work in progress', open to amendments and additions in function of the views exchanged between the participants of the workshop. The views expressed in this paper do not necessarily reflect the view of the organizations sponsoring the workshop.

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Executive Summary

Payments for ecosystem services (PES) have recently been gaining increasing attention as a promising new environmental policy instrument. With various programs and pilot projects underway around the world, the need for institutional support for PES at the global level is becoming increasingly significant. However, in such a new and fast-growing field, there still remain important challenges to overcome before PES are widely applied at the international level.

A significant hurdle lies in the conceptual haze surrounding the definition and classification of the many different types of ecosystem services and payment schemes that are used to protect them. Furthermore, technical issues relating to the implementation of the various PES schemes have arisen in past experiences, highlighting important shortcomings in the process of using such market-based instruments. In many cases, poorly defined property rights, inefficient monitoring and enforcement, poor political support, perverse incentives, and inequitable distribution of payments have hindered the progress of sustainable PES schemes.

The challenges that stand in the way of an international development of PES are present both on the supply and demand sides. Also, the institutional support necessary for joining those two main parties together is still not in place at the international level. Indeed, policy makers, practitioners, and researchers alike all face a considerable task when addressing the future development of international PES (IPES). While pursuing the debate on the many conceptual and technical uncertainties surrounding this field, experts will also need to work on building institutional capacity and gaining more support from various stakeholders. Coordination among the various organizations and the pilot projects that they implement will also be essential for the development of IPES.

The technical discussion hosted jointly by the United Nations Environment Program (UNEP) and the World Conservation Union (IUCN), in close collaboration with the Convention on Biological Diversity (CBD), can serve as a strong foundation for future work on IPES. After having fully explored the many challenges that stand in the way of the development of IPES, different options for expanding and strengthening these instruments will be discussed. Finally, the participants will draw up an action plan for future work on this promising new form of international environmental management.

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Introduction

The field of payments for ecosystem services (PES) has received increasing attention in recent years from researchers, conservation NGOs, governments and the private sector. To date, much knowledge and experience has been acquired. A myriad of PES or PES-like projects have been proposed and implemented, providing valuable insights into the practical applicability of such payment systems.

The geographic scale of PES initiatives varies widely: some involve purely local transactions while other schemes are national or international in scale. With the exception of carbon markets, however, international payments for ecosystem services remain relatively limited. Nevertheless, many observers believe that broader application of PES at an international scale has significant potential as a means to support environmental and development goals.

Despite past successes with PES projects, many challenges remain to be addressed, including: a) lack of knowledge concerning the links between ecosystem management, service provision and economic activity; b) the absence of enabling policies and institutions to capture willingness-to-pay, resulting in limited effective demand for ecosystem services¹; and c) limited capacity to design and implement PES schemes, especially in developing countries. In addition, there is continuing debate over the distributional impacts of PES and its compatibility with poverty reduction.

This paper aims to survey PES with a view to informing discussion of the potential for developing payments for ecosystem services at an international scale. By exploring existing and potential PES schemes and identifying the challenges to their implementation, we hope to improve understanding of the key equity, efficiency, and institutional issues that need to be addressed in the development of *international* PES systems.

Part I – Motivation and Review

1. The Need for International PES

1.1. The Millennium Ecosystem Assessment

Linking human and natural wealth

Despite considerable efforts undertaken to promote more sustainable use of natural resources around the world, we have yet to witness a reversal in the general trend of environmental degradation. Humans continue to consume more environmental goods and services than nature can sustain, and more harmful substances are discharged into ecosystems than can be naturally absorbed.

The *Millennium Ecosystem Assessment* (MA)² compiled scientific data on the status and trends of the world's ecosystems. It was conducted over a period of four years and completed in March 2005. The MA synthesizes information from scientific literature, the private sector, public environmental agencies, and local communities alike. It represents the current consensus on the state of the planet and has wide credibility among governments, NGOs, researchers, and the private sector.

¹ Wunder, S. (2005) *Payments for Environmental Services: Some Nuts and Bolts*, CIFOR, Occasional Paper No. 42.

² www.millenniumassessment.org

The MA shows how human welfare has been improved in large part thanks to the exploitation of natural ecosystems. Food provision, for example, has increased dramatically, due to the expansion of land under crops and the adoption of more technologically advanced (and energy-intensive) farming practices. On the other hand, the MA stresses the growing threat to human well-being posed by unsustainable use of natural resources. Many goods and services provided by nature, such as fresh water, wild foods and genetic resources, are increasingly scarce relative to demand. Overall, the MA reports that 60 to 70% of the world's ecosystem services are deteriorating. The MA further develops various scenarios to explore the relationship between human behaviour and the future provision of environmental goods and services.

Defining and classifying ecosystem services

The MA introduces the concept of *ecosystem services* as a means to clarify the relationship between human welfare and natural wealth. The concept refers to the many natural processes by which ecosystems, and the species that make them up, “sustain and fulfil human life”³. For example, the absorption of carbon dioxide through the natural process of photosynthesis can be considered an ecosystem service provided by biomass in terrestrial and marine ecosystems, helping to mitigate climate change arising from the combustion of fossil fuels. Many other biophysical processes provide similar direct and indirect benefits to humans.

The relevance of many different ecosystem services to a wide range of human activities renders the classification of such services rather difficult. A complete taxonomy of ecosystem services has been considered a necessary first step for effective environmental policy-making⁴.

Classifications of ecosystem services could be based on various criteria, such as geographical scale (local, regional, global), value to society (direct, indirect, non-use), or their relative contribution to global and regional sustainability. The World Resources Institute classifies ecosystem services according to the type of ecosystem providing the service (forest, coral reef, wetland, etc.)⁵. The MA, on the other hand, uses a ‘functional’ classification, organizing ecosystem services into the following categories⁶:

- Provisioning – ex: timber, fruits, medicines
- Regulating – ex: air and water cycles, climate, pollination
- Cultural – ex : aesthetics, education
- Supporting – ex: soil formation, nutrient cycling

Yet another way of grouping ecosystem services can be seen below⁷:

- Production of goods (timber, pharmaceuticals, food)
- Regeneration processes (cycling and filtration of water and air, pollination, seed dispersal)
- Stabilizing processes (climate, flood control)
- Life-fulfilling functions (cultural values, aesthetic value)

³ Daily, G. (1997) *Nature's Services: Societal Dependence on Natural Ecosystems*. Island Press, Washington DC, United States.

⁴ Perelet, R. (2003) *Global Ecosystem Goods and Services – International Exchange and Trade*, document for the Workshop on Integration of biodiversity considerations into policies of financial and private sectors, April 2003.

⁵ Reproduced in Perelet, R. (2003), op. cit.

⁶ Millennium Ecosystem Assessment (2005) *Ecosystems and Human Well-being: Synthesis*, Island Press, Washington, DC.

See also <http://www.greenfacts.org/ecosystems/toolboxes/box2-1-services.htm>

⁷ This classification is offered in Heal et al. (2002) *Protecting Natural Capital Through Ecosystem Service Districts*, Stanford Law Journal, USA.

Whatever classification system is used, it is clear that ecosystem services make a significant contribution to human well-being. It is also clear from the MA and other assessments that most ecosystem services are increasingly threatened.

1.2. From Economic Instruments to PES – Internalising Environmental Benefits in Economic Decisions

Trends in environmental management

The MA stresses the need for significant changes in environmental policies, institutions, and practices. The development of economic instruments that take into account the non-market values of ecosystem services is considered one ‘promising response’ to the challenges that need to be overcome.

Many ecosystem services are provided free of charge and would be prohibitively expensive or impossible to replicate with existing technology. So-called command-and-control approaches to environmental management, involving legal restrictions on the use of natural resources or direct provision of environmental goods by governments, may have reached the limit of their effectiveness. As environmental degradation continues and human demand for resources intensifies, efforts to internalise the value of environmental assets in economic activity are likely to become a more important component of conservation efforts.

All economic instruments seek to internalise environmental costs or benefits into production and/or consumption decisions. By attaching a private property right or a price to public environmental goods and services, economic instruments aim to induce more efficient use of natural resources and, in some cases, stimulate private supply of environmental benefits. Economic instruments include, *inter alia*, environmental taxes and subsidies, property rights and trading regimes, environmental labelling, and liability systems.

Payments for ecosystem services

Payments for ecosystem services (PES) are one of the most promising forms of economic instrument in use today. In contrast to many other approaches to environmental protection, PES seeks to link the beneficiaries and providers of ecosystem services, typically on a fee-for-service basis. Well-designed PES is believed to increase both the efficiency and accountability of funds invested in environmental protection.

Another alleged advantage of PES schemes over other conservation efforts is their use of positive incentives. In contrast to the ‘polluter pays principle’, which penalizes natural resource users and polluters for their behaviour, PES aims to elicit payments from the beneficiaries of ecosystem services and channels these to the people who supply such services (what could be called the ‘provider gets principle’). Payments for ecosystem services can therefore be considered as a means of supporting and motivating positive externalities, as opposed to other instruments that are designed to correct for negative externalities.

2. Review of Existing PES

Defining and classifying PES

Generally speaking, payments for ecosystem services are a method of internalising the positive externalities associated with a given ecosystem or a specific resource use⁸. For the purpose of this paper, we adopt Sven Wunder's suggested definition of PES⁹ as:

- a. a **voluntary** transaction where
- b. a **well-defined** ES (or a land-use likely to secure that service)
- c. is being 'bought' by a (minimum one) ES **buyer**
- d. from a (minimum one) ES **provider**
- e. if and only if the ES provider secures ES provision (**conditionality**).

Different forms of PES can be classified according to their key features¹⁰:

- PES can be **area-based** or **product-based** schemes. The former provide payments contingent upon adoption and maintenance of a particular type of land use. In the latter, consumers pay a 'green premium' in addition to the market price of a product or service, in order to ensure an environmentally friendly production process (typically verified through independent certification).
- Depending on who are the buyers of ecosystem services, PES can be either **public** or **private**. In a public scheme, the state uses general or ear-marked tax revenue to buy ecosystem services on behalf of its citizens. Private schemes establish a direct link between the user of an ecosystem service and the provider.
- Finally, PES can be grouped into **use-restricting** schemes, where providers receive payments for conserving an existing environmental asset, such as natural habitat or stored carbon, and **asset-building** schemes, where new ecosystem services are established or degraded services are restored.

PES can also, of course, be classified according to the geographical level at which they operate. Watershed management schemes, in particular, are often **local or regional** in scale. On the other hand, the Clean Development Mechanism under the Kyoto Protocol is an example of a truly **international** PES.

Despite the many different sorts of existing and potential PES schemes, the most commonly recognized types are the following¹¹:

- **Public payment schemes** to private owners
- Open **trading** under a regulatory cap or floor
- Self-organized **private deals**
- **Ecolabelling**, which is an indirect form of PES

Examples of these various schemes are developed in the next section, including initiatives that rely on a combination of approaches.

⁸ Pagiola, S. et al. (2004) *Paying for Biodiversity Conservation Services in Agricultural Landscapes*, The World Bank, Washington D.C.

⁹ A thorough discussion of this definition can be found in Wunder, S. (2005), op. cit.

¹⁰ This classification follows Wunder, S. (2005), op. cit.

¹¹ Sherr, S., White, A. & Khare, A. (2004) *For Services Rendered*, ITTO Tropical Forests Update: 14/2, Tokyo.

Some examples

There are myriad examples of existing PES or PES-like schemes¹². Here we will mention a few cases to show the variety of possible applications of PES.

- An example of a **public payment scheme** can be found in Costa Rica, where authorities have developed an elaborate nation-wide system of PES, the Pago por Servicios Ambientales (PSA). In this program, landowners can be contracted by the government to provide mitigation of greenhouse gases services, hydrological services, biodiversity conservation as well as the provision of scenic beauty. Funds come from a fossil fuel tax, from support by the World Bank and the GEF, and from payments received from beneficiaries of ecosystem services¹³.
- In the United States, there are several existing ecosystem **trading** programs whereby public and private developers can compensate or ‘mitigate’ the loss of natural habitat, when adverse impacts are considered unavoidable, by financing the creation, restoration and / or protection of comparable habitat. The most developed program is for wetland mitigation under the Clean Water Act of 1972. So-called wetland ‘banks’ have been set up in most states to provide wetland ‘credits’ to developers on a commercial basis. Similar cap-and-trade programs have been (or are being) developed to conserve natural habitat and water quality in the USA, Australia, Brazil, Canada, France, Mexico, the Netherlands, UK and other countries.
- Another example of using **trading** mechanisms is the Kyoto Protocol, the first truly international PES scheme. Its Clean Development Mechanism allows industrialized countries to invest in climate mitigation projects (including reforestation and afforestation) in developing countries, in return for Certified Emission Reductions (CERs), which count towards national targets for carbon emission reductions agreed by signatories to the Protocol.
- The French natural mineral water bottler “Perrier Vittel” has made payments to landowners to adopt less polluting agricultural practices and to encourage reforestation of sensitive infiltration zones, in order to protect their raw water supply. This is an example of a self-organized **private deal**.
- **Eco-labelling** refers to the marketing of particular services or products that are independently certified as ‘sustainably’ produced. Shade-grown coffee is an example of a production process bearing a sustainability certification.

Most PES are at an early phase of implementation. In developing countries, international donors and development agencies such as the German GtZ, the Global Environmental Facility (GEF) and the World Bank often play an important supporting role in developing PES. The World Bank’s Ecomercados (or Ecomarkets) project in Costa Rica, for example, is a major partner in the country’s national PES scheme¹⁴.

The GEF and the World Bank also support the Regional Integrated Silvopastoral Ecosystem Management Project (**RISEMP**), which acts at the local level in three different micro-watersheds in

¹² For a review of 287 forest-related PES and PES-like schemes see: Landell-Mills, N. & I T Porras, I.T. (2002), *Silver bullet or fools’ gold – A global Review of Markets for Forest Environmental Services and Their Impact on the Poor*, IIED, London.

¹³ See: Pagiola, S. (2002) *Paying for Water Services in Central America: Learning from Costa Rica*, in *Selling Forest Environmental Services*, edited by Pagiola, S., Bishop, J. & Landell-Mills, N., Earthscan, London.

¹⁴ Details on the this project can be found at:

<http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=64290415&theSitePK=40941&menuPK=228424&Projectid=P052009>

Latin America¹⁵. Shifts from pasture use to silvopastoral practices are rewarded through payments determined by a point system that assesses both the biodiversity and carbon sequestration services provided through the new land use.

Valuing ecosystem services

Perhaps the most well known dollar figure that has been attributed to ecosystem services is the \$33 trillion per year estimated in 1997 by Costanza and his colleagues¹⁶. Other studies have focused on smaller geographical scales, such as the valuation of forest ecosystems in the Mediterranean region, which estimated their total economic value at about 1% of the average GDP of the European and African countries considered in the study¹⁷. The famous example of the New York City – Catskill watershed management programme, which provided public payments to landowners in order to improve farm and forestry practices, resulted in savings calculated around \$5 billion¹⁸.

A newly created web-based information portal, the Ecosystem Marketplace, tracks activities in PES for water, carbon, and biodiversity, summing up the dollar figures for the many transactions identified. The estimates of the total transaction values up to date are in the hundreds of millions¹⁹, covering deals such as: nutrient, salinity and emissions trading; conservation and wetland banking; biodiversity offsets; payments for hydrological services; and CDM and JI projects under the Kyoto Protocol.

Although increasingly used, valuation techniques for environmental goods and services can be quite complex. There are several approaches to the valuation of natural capital, and each should be applied according to the specific objectives of a given study. Four main approaches to valuation have been identified, attributing dollar figures to ecosystems according to: 1) their contributions to overall economic activity, 2) the economic effects of changes in the flows of benefits derived from ecosystem services, 3) the distribution of the benefits among stakeholder groups, and 4) the identification of the main beneficiaries of conservation efforts²⁰.

While valuation techniques continue to evolve, PES schemes will need to be set in accordance with the results of relevant studies. A particularly promising effort at combining valuation studies with site-specific ecosystems, called the EcoValue project²¹, is currently being developed at the University of Vermont. By creating interactive maps capable of offering a geographical interpretation of the economic values of ecosystem goods and services, such efforts can provide a strong scientific backing to the development of PES at various scales.

The big four

PES initiatives have revolved mainly around 4 main ecosystem services, namely: **carbon sequestration, biodiversity conservation, watershed protection, and scenic beauty**. However, other services such as soil renewal or regulation of nitrogen flows could also become the focus of future PES initiatives, building on increasing awareness of their significance for human well-being.

¹⁵ Further details on RISEMP can be found in: Pagiola, S. et al (2004), op. cit.

¹⁶ Costanza et al (1997), *The Value of the World's Ecosystem Services and Natural Capital*, Nature 387, pp 253-260, 1997.

¹⁷ Pagiola, S., von Ritter, K. & Bishop, J. (2004) *How Much is an Ecosystem Worth? Assessing the Economic Value of Conservation*, The World Bank, Washington D.C.

¹⁸ Perrot-Maître, D. & Davis, P. (2001) *Case Studies of Markets and Innovative Financial Mechanisms for Water Services from Forests*, Forest Trends, Washington D.C.

¹⁹ For more information, see the Market Watch section of www.ecosystemmarketplace.com

²⁰ Pagiola, S., von Ritter, K. & Bishop, J. (2004) op. cit.

²¹ For more information, see: <http://ecovalue.uvm.edu/evp/default.asp>

3. International PES

Defining IPES

Building on the definition of PES given above, we may further define international PES (IPES) as:

*"a voluntary, international transaction where at least one payer makes a payment to at least one provider, conditional on the provision of a well-defined, continuously provided ecosystem service or of an ecosystem-use likely to secure that service (i.e. use of land and water/marine ecosystems)."*²²

Of the four main types of PES listed in the previous section, **carbon** and **biodiversity** appear to have most relevance at the international scale. Payments for **carbon** sequestration are truly a global form of PES, in which the geographic location of the buyer and supplier are essentially irrelevant (except with respect to liability for climate mitigation and eligibility to supply credits, which is based on political rather than technical considerations).

Payments for **biodiversity** conservation are also primarily international. One example is the case of pharmaceutical companies that are keen to exploit the genetic biodiversity of tropical countries. Large conservation NGO's are also important buyers of biodiversity services, for example when the Nature Conservancy buys development rights from landowners in order to ensure environmental conservation.

Payments for **watershed protection**, on the other hand, are usually intended to assure water quality and flow, sediment retention, and flood reduction at a very local scale. Buyers of such services are usually located in close proximity to the sellers, for example when an hydroelectric company pays landowners to adopt land use practices that reduce the amount of sediment coming from the watershed in which it operates.

Payments for **scenic beauty** are also context-specific, although in this case international tourists, and eco-tourists in particular, may be important buyers. Indeed, if landowners are to be paid for the aesthetic value of their properties, then international travelers are an important category of service buyers.

Focusing on biodiversity protection

There is a large gap between the development of the global carbon market and other markets for ecosystem services. Yet, there are many opportunities for using PES to finance biodiversity conservation, such as agri-environmental schemes, mainstreaming biodiversity into carbon finance, biodiversity offsets, user fees for protected areas, and marine services for restocking fisheries²³.

Despite the existence of many PES schemes around the world, there is still insufficient institutional support for these efforts at an international level. Biodiversity-related ecosystem services are in particular need of attention, as their global importance implies the need for international cooperation.

The development of IPES should therefore have a central focus on biodiversity, a global public good which, unlike carbon, does not currently benefit from market-based incentives at an international scale. At the same time, a focus on biodiversity conservation in the development of IPES should not exclude other important ecosystem services, such as cultural values. In this regard, interactions between different ecosystem services need to be taken into account.

²² Definition adapted from: Wunder, S. (2003) *Payments for Ecosystem Services: Challenges and Opportunities*, Power Point presentation at Conservation International, Washington D.C.

²³ GEF (2006), *Discussion Note for High Level on Market Mechanisms for Financing Global Environmental Conventions*, Document prepared for the Third GEF Assembly, Cape Town, South Africa, August 29-30 2006.

One issue that will be particularly relevant for IPES is the management of large trans-boundary ecosystems. The preservation of the Meso-American Biological Corridor is an example of a trans-boundary project that could benefit from IPES. Actually, the Global Environment Facility (GEF) uses payments for ecosystem services to help preserve key areas of the corridor²⁴.

Building institutional capacity for IPES represents an important first step in developing this new instrument for conservation purposes. There is still much to learn from experiences with different forms of PES at all scales. The following section identifies some key challenges that stand in the way of IPES by focusing on issues related to supply, demand, and the institutional framework needed to bring potential buyers and sellers together.

Part II – Challenges and Open Questions

1. The Supply of Ecosystem Services

1.1 Who Provides the Service?

In most cases, the suppliers of ecosystem services are the landowners of the area that is the focus of the transaction. This land can either be privately or publicly owned. Government-owned national protected areas can, for example, be eligible for PES, as is the case in the province of Heredia, in Costa Rica²⁵. Municipal and regional authorities can also become the suppliers of ecosystem services.

For privately owned properties, the suppliers of the services can be single individuals or businesses, or groups of individuals or businesses. In other cases, a community can own the land, as is often the case in indigenous reserves. Sometimes, non-governmental organizations are the suppliers of ecosystem services, as is the case for the Monteverde Conservation League, which receives payments from a hydroelectric company for the water-based ecosystem services provided by the forest that they own²⁶.

In developing IPES, the potential for an international supply of ecosystem services will need to be explored. This can occur in situations where the ecosystems being considered cross national borders. Under such a scenario, international cooperation will be necessary to determine who is responsible for the provision of the services. We can easily imagine alliances between several countries that share a given ecosystem service. Also, the recent alliance of some of the world's most "biodiverse" nations could set the stage for associations of international ecosystem services providers at even larger scales²⁷.

Agricultural lands

Farmers represent a very important stakeholder group, as their lands can offer many ecosystem services. By either combining productive land uses with conservation efforts (e.g. creating riparian

²⁴ Pagiola, S. et al (2004), op. cit.

²⁵ In this region of Costa Rica, three municipalities have joined together to impose an 'ecological' water tariff on the utilities bill of the residents. The funds collected are then used to compensate forest conservation and reforestation projects. One of the beneficiaries are the federal protected area authorities (SINAC) who manage a national park, named Braulio Carillo, which is partly in the upper watershed of the area.

²⁶ Rojas, M. & Aylward, B. (2003) *What are we Learning from Experiences with Markets for Environmental Services in Costa Rica? A Review and Critique of the Literature*, IIED, London.

²⁷ Cancun Declaration of Like-Minded Megadiverse Countries, 2002, available at http://www.unido.org/file-storage/download/?file_id=11803

buffer zones, planting trees in pastures, using sustainable production methods), farmers can become an important supplier of ecosystem services. Farmers in Colombia, Costa Rica, Mexico, and Nicaragua are already being paid to provide carbon sequestration and biodiversity services through the use of silvopastoral systems²⁸.

In developed countries, notably in the United States and the European Union, economic incentives for improving the environmental quality of agriculture have become increasingly used. For example, payments can be distributed for retiring land from productive use (in accordance with specific environmental objectives) or for adopting less-intensive farming practices. There are many different environmental benefits to such projects, such as reduced erosion rates, limited water pollution and over-grazing, and maintenance of biodiversity, and preservation of scenic and cultural landscapes²⁹.

1.2 Standardizing the Provision of Services

Measuring the supply

The MA found that the provision of certain ecosystem services such as food production has increased over time while other services are on the decline. If efforts to promote the wider application of PES schemes are successful, and demand for ecosystem services grows sufficiently or is channeled properly, it will become increasingly important to understand how ecosystem services affect human activities.

A key issue is the establishment of adequate measurements that are capable of translating natural processes into economic values. Over and above the ethical debate surrounding the attribution of monetary value to ecosystems and its relation to the privatization of natural public goods and services, the technical challenges involved in measuring ecosystem services are not easily overcome³⁰. Watershed services have struggled with this issue, as services are generally not comparable across different watersheds. Consequently, a uniformly accepted measurement for the hydrological benefits of forests, for example, does not exist.

To make an IPES scheme successful, the benefits of an elaborate assessment of the services being delivered need to be balanced against the costs. However, as mentioned above, it may be difficult to accurately assess the services delivered by an ecosystem. The services may also affect each other, creating situations where it is not easy to measure them separately. In addition, scientifically accurate methods may be difficult to apply in practice and may also induce unwanted bureaucracy.

This discussion is particularly relevant for biodiversity services since the relation between land use practices and biodiversity benefits are anything but straightforward³¹. While assessing only land-use patterns is a very simple approach and can be easily implemented, it often fails to properly account for actual services delivered. As a result, desirable land uses may be under-paid while less desirable land uses are over-paid.

Various projects address this issue by establishing some sort of point system for biodiversity, or even a mixed point system for various types of ecosystem services. Two examples are the Environmental Benefits Index (EBI) applied in the US Conservation Reserve Program, and the

²⁸ GEF (2006), op. cit.

²⁹ OECD (2004) *Agriculture and the Environment: Lessons Learned from a Decade of OECD Work*, Paris.

³⁰ Nasi, R., Wunder, S. & Campos, J.J. (2002), op. cit.

³¹ Pagiola, S. et al (2004), and ten Kate, K., Bishop, J. & Bayon, R. (2004), *Biodiversity Offsets: Views, Experience and the Business Case*, IUCN, Switzerland.

point structure of the Regional Integrated Silvopastoral Ecosystem Management Project (RISEMP) implemented in three Latin-American countries³².

If PES schemes are to be applied at the international level, the lessons from these and other relevant projects need to be thoroughly analyzed. In this context, it still needs to be determined to what extent regional or even international standardization of assessing ecosystem services can benefit the cause of conserving nature through PES schemes.

Spatial considerations

Another important concern regarding the quantity and quality of the ecosystem services being provided relates to issues of scale. Indeed, geographical considerations can also be a source of complication for the provision of services, as the exact location and sizes of the areas concerned are not always clearly defined.

The provision of some ecosystem services is relatively independent of the location and the amount of the service provided. The carbon sequestration benefits of afforestation or reforestation, for example, depend mainly on the overall area of planted forest, and not particularly on whether this area is continuously connected. For many other services, especially for those relating to biodiversity, the benefits may depend not only on the type of land use, but also on its location, its extent, and its relationship to other land uses³³.

When trying to develop IPES schemes that cover biodiversity services, it will be important to have a clearer understanding of these nonlinear area effects in order to set up an adequate payment structure, e.g. through appropriate minimum area or connectivity requirements. In addition, other nonlinear effects of ecosystem behavior may be relevant when using PES schemes to promote conservation. The extinction of a species is an irreversible process, and the resilience of ecosystems may be a nonlinear function of the level of biodiversity³⁴. If demand is created through regulations (cap and trade), such nonlinear aspects need to be taken into account when determining the overall level of services that will be provided.

Baselines and additionality

Both for the design and the evaluation of PES schemes, the establishment of an adequate baseline is crucial. Baselines are relevant when defining the type of ecosystem service being provided. For example, the question of whether or not avoided deforestation should be considered a legitimate means of storing carbon is often discussed in the context of the potential extension of the Clean Development Mechanism of the Kyoto protocol³⁵. The same holds for other services such as biodiversity conservation. Managers of PES schemes will need to estimate people's behavior in the absence of the scheme and may decide to honor anything additional to this baseline condition as being a service provided.

However, such a procedure may lead to a moral hazard as potential service providers gain the incentive to threaten to change their land use in order to receive payments under the newly installed scheme. When designing trading platforms at the international level, where service providers may be national governments, the problem is slightly different but does not go away. In this case the issue is how to penalize non-compliance if governments fail to meet their obligations.

³² For more info on the EBI, see: www.fsa.usda.gov/pas/publications/facts/ebiold.pdf. For more info on RISEMP, see Pagiola, S. et al (2004), op. cit.

³³ Pagiola, S. et al (2004), and Savy, C.E. & Turpie, J.K. (2004) *Payments for Ecosystem Services: A Review of Existing Programmes and Payment Systems*, Anchor Environmental Consultants CC.

³⁴ Shapin, F.S. et al (2000) *Consequences of Changing Biodiversity*, Nature No. 405, May 2000.

³⁵ Wunder, S. (2005), op. cit.

A clear understanding of baseline conditions is also needed when evaluating PES projects. Quantitative analyses of project success need to compare the achieved level of service provision with the hypothetical level in the absence of the payment scheme. Failure to produce accurate baselines will blur any evaluation results. One option would be to use statistical methods such as experiments, quasi-experiments, control groups, and instrumental variables to isolate the effect of a PES scheme above a baseline level.

Future project studies and conceptual work may be needed to find the appropriate policy tools to ensure additionality while avoiding perverse incentives.

1.2 Technical Issues

Perverse Incentives and Leakage

As mentioned above, PES schemes can create perverse incentives even if they tie payments directly to the provision of ecosystem services. Users or owners of forests may threaten to convert their forests to farmland in order to receive payments for conservation. Land users who are willing to convert their land to a more environmentally friendly use might wait to do so until a payment scheme that would compensate them for their efforts is installed, especially if pilot projects have been carried out in the region³⁶. Also, companies providing services at a larger scale or investors involved in trading permits may have an incentive to spur the degradation of ecosystem services in general to make their own assets more valuable. PES schemes could have the perverse effect of removing the moral burden from resource users and polluters by giving them a “license to trash”³⁷.

A further effect that may reduce the efficiency of PES schemes is that of leakage. While PES schemes can induce desirable land use change in the target area, there might be adverse effects outside this area that need to be taken into account when evaluating the success of a scheme. For example, environmentally unsound practices may simply shift location. A possible solution may be to provide payments for average services delivered over entire farms or even states or countries, thus paying only for the net effect³⁸. Wherever possible, leakage effects should be addressed from the outset in order to minimize them. Any remaining leakage needs to be taken into account when conducting the project evaluation.

Offering one or several ecosystem services?

Another important issue that needs to be addressed while exploring the potential obstacles that may hinder the development of the supply-side of PES (and IPES) is whether the services need to be considered separately when implementing payment schemes, or whether a bundle of services is more appropriate. While in certain cases ecosystem services may create synergetic effects when provided simultaneously, in others they might stand in competition with one another. For example, full conservation of biodiversity in an old-growth forest will disallow food production on that land area, while the planting of shade-grown coffee combines food production with the provision of higher levels of biodiversity than in a monoculture plantation.

Land use decisions will need to consider the trade-offs between various ecosystem services and productive activities and should seek to exploit any potential synergies, such as through agroforestry or silvopastoral systems. In the case of the RISEMP project, mentioned above, the respective contribution of each service can be computed into a bundled value for any given land use. This could then help make the provision of ecosystem services a more profitable undertaking. More importantly, it can serve as a means of joining carbon and biodiversity services into one

³⁶ Wunder, S. (2005), op. cit.

³⁷ ten Kate, K., Bishop, J. & Bayon, R. (2004).

³⁸ Wunder, S. (2005), op. cit.

payment that will vary according to land-use types. However, such efforts are still at the initial stage of implementation, and further exploration of the interrelations between various ecosystem services is necessary³⁹.

There also exist cases where the bundling of ecosystem services runs the risk of fostering an over-inclusive PES scheme. A recurrent criticism of the Costa Rican national PES is related to the fact that every payment distributed by the government is for the full bundle of four ecosystem services (carbon, biodiversity, water, and scenic beauty). Theoretically, each service is worth \$10/ha/year, and everyone receives \$40. Critics have pointed out that monoculture plantations included in the PES receive payments for services that they do not provide (biodiversity and scenic beauty). The lack of differentiation between land uses that provide varying amount of ecosystem services (e.g. plantations vs. pristine cloud forests) has reduced transaction costs but may have jeopardized the overall credibility of the program⁴⁰.

2 The Demand for Ecosystem Services

2.1 Who Benefits from the Service?

Potential buyers of ecosystems services could be anyone interested in the preservation of a given ecosystem. As was the case with the supply side, demanders can either be private or public entities, businesses or NGO's, groups or individuals. Example of a publicly-funded payment for ecosystem services can be found in Costa Rica, with the national PES deriving its funding from a consumption tax, and in New York City, where municipal authorities compensate land owners in the Catskills for the sustainable management of the watershed that provides the city with drinking water.

At the international level, donor and grant funds are often buyers of ecosystem services, as is the case for the Global Environment Facility. National governments, notably through their development agencies, have also invested significantly in IPES projects. However, the key for significantly expanding PES at the international level lies in the private sector, as businesses have the largest potential for further developing markets for ecosystem services. Already, hydroelectric, pharmaceutical, utilities, and bottling companies are paying for ecosystem services, and their pioneering role could influence others in the future.

2.2 Increasing the Demand for Ecosystem Services

Direct payments vs. eco-labelling

Future international and trans-boundary PES schemes can only be successful if they are able to raise the necessary funds to cover the payments, i.e. they need to consolidate the existing demand. Such demand can come from the private sector, but also from governments, NGOs, or individual consumers. The mere existence of many voluntary PES schemes shows that there is a demand for ecosystem services, and it seems to be increasing over time⁴¹. However, as ecosystem service are highly heterogeneous, the demand can be difficult to harmonize.

³⁹ Gutman, P. (2006) *Ecosystem Services: The Search for a New Rural-urban Compact*, WWF, Washington D.C.; and Kumar, P. (2005), *Market for Ecosystem Services*, IISD, Canada.

⁴⁰ Baltodano, J. (2004) *Los Mercados de Servicios Ambientales y la Privatización de Recursos : Caso Costa Rica*, COECOCEIBA-FOE, San Jose, Costa Rica.

⁴¹ Jenkins, M., Scherr, S.J. & Inbar, M. (2004) *Markets for Biodiversity Services – Potential Roles and Challenges*, Environment, Vol. 46, No. 6, 2004.

The willingness to pay of these beneficiaries of ecosystem services is most easily turned into payments when beneficiaries are already organized⁴². If this is not the case, further initiative may be needed, such as offering platforms where potential buyers can obtain information. This may be at the business level, but can also include eco-labeling to allow consumers to make informed choices.

It has been argued that direct payments are more efficient as a conservation policy instrument than eco-labeling approaches, but that the latter may still be the best available choice in the case where direct payment schemes are not an option⁴³. Eco-labeling markets might be the fastest growing market for ecosystem services⁴⁴. Eco-labels are particularly appropriate for securing biodiversity protection, and therefore have much potential for joining buyers from developed countries with sellers from developing and resource-rich countries.

Getting the private sector more involved

Over the last years, the discussion on PES in the academic world has been vibrant, and there is much hope that this enthusiasm will carry over to the private sector. As the notion of ecosystem services becomes widespread, as demonstrated by the cover page of the Economist in April 2005, the private sector is becoming increasingly attentive to this new field⁴⁵. Indeed, certain businesses may either see it in their own interest to contribute to PES schemes, or they might want to get a head start on working with new markets that could become increasingly important in the future.

Payments for ecosystem services offer a progressive way of overcoming the traditional cleavage between environmental and economic interests. Payment schemes are a positive tool since they do not operate under the polluter pays principle, but rather under the provider gets principle. It may be easier to convince companies to pay for the services they consume than to hold them liable for the negative externalities that they cause. This can be seen in the rising voluntary demand for and the increased interest in positive financial mechanisms for attaining sustainable development coming from private sector companies⁴⁶.

Polluters and natural resource users may see PES schemes as an option to act preemptively and avoid government regulation by voluntarily offsetting their negative effects on the environment through the purchase of ecosystem conservation services. Payment and trading schemes are known to be a more efficient and hence less costly means of conservation than command-and-control instruments.

Still, there are many risks involved with PES that businesses might be wary of. For example, high transaction costs and the difficulty in proving and quantifying environmental benefits are two key issues that will need to be addressed in order to get the private sector on board⁴⁷.

Creating demand through regulations

Perhaps the most direct way of creating more demand for PES from the private sector is to use regulations. A legal limitation on natural resource use or pollution is – at least theoretically – the most straightforward way to create scarcity and hence induce demand (if accompanied by offset and trading frameworks). Such regulations can blend well with PES schemes. This approach has, for

⁴² Pagiola, S. & Platais, G. (2002) *Payments for Environmental Services*, Environmental Strategy No. 3, The World Bank, May 2002.

⁴³ Ferraro, P.J., Uchida, T. & Conrad, J.M. (2005) *Price Premiums for Eco-friendly Commodities: Are 'Green' Markets the Best Way to Protect Endangered Species?* Environmental and Resource Economics, Vol. 32/3, November 2005.

⁴⁴ Jenkins, M., Scherr, S.J. & Inbar, M. (2004), op. cit.

⁴⁵ Business for Social Responsibility (BSR) report (2006) *Environmental Markets: Opportunities and Risks for Business*, BSR, San Francisco USA. Accessed at www.bsr.org

⁴⁶ See for example the Katoomba Group that involves the private sector and NGOs alike (www.katoombagroup.org).

⁴⁷ BSR (2006), op. cit.

example, been realized in the case of the carbon market that was created through the Kyoto Protocol, as well as in the case of the wetland mitigation banking system in the US. Combining trading platforms with regulatory limitations has worked in the past⁴⁸, and could prove equally successful with PES.

The downside of this approach is, of course, that it may be very difficult to gain political support and overcome vested interests, especially when trying to act at the international level. Certain industries would be more affected than others, and could be more hesitant at buying into a program that has restrictive regulatory limits.

Support for cap-and-trade measures is easier to obtain if general awareness is high, and positive examples like the Kyoto Protocol can raise such awareness. Extending the carbon market model to biodiversity-related ecosystem services could be a good way forward for developing IPES, but greater overall awareness is necessary for the appropriate parties to come together.

3 Building Institutions to Support PES

3.1 Assuring an Adequate Framework

Property rights and land tenure

PES schemes cannot function without having the necessary institutional capacity in place. This will be important at the local and national levels when talking about issues of land tenure and property rights. National governments will be more relevant when it comes to creating the necessary legal framework. International institutions, NGOs, as well as governments may be needed for brokering, monitoring, and evaluation tasks.

Perhaps the most often voiced concern in terms of developing PES schemes is the issue of property rights. Indeed, in order to allow environmental markets to work efficiently, property rights need to be clearly assigned⁴⁹. In many prime application areas for PES schemes, e.g. in biodiversity-rich tropical forestlands, such property rights are often ambiguous, not enforced, or even non-existent. A further complication arises from the fact that the land users are often not the owners.

If sufficient governmental institutions are present, property rights can be clearly assigned and enforced. Owners of these rights then become potential sellers in PES schemes. In this case, rights can be given to individuals, firms, or communities.

Assigning property rights distributes wealth and should thus be seen in the context of making PES schemes pro-poor. If property rights are difficult to establish or clarify, it may also be possible to work with the 'de facto' property owners, i.e. the land users⁵⁰. In the long run, this can, however, raise the incentive for profit-oriented companies to acquire land for ecosystem service delivery, which may restrict access for traditional land users.

Legal systems and implementing institutions

Legal systems are relevant to PES schemes in two ways. Firstly, the selling and trading of ecosystem services needs to be enabled within the legal framework of the respective country or

⁴⁸ The case of trading in sulfure dioxide in the US during the 1990s is an often cited example of the strong performance of market-based environmental policy tools.

⁴⁹ Kumar, P. (2005), op. cit.

⁵⁰ Ferraro, P. & Simpson, R.D. (2003) *Protecting forests and biodiversity: Are investments in eco-friendly production activities the best way to protect endangered ecosystems and enhance rural livelihoods?* Paper presented at The International Conference on Rural Livelihoods, Forests and Biodiversity, May 19-23 2003, Bonn, Germany

province⁵¹. Legislation can go further by specifying the details of the process and by assigning oversight, certification, and monitoring responsibilities to governmental institutions, NGOs, or private businesses.

However, many of these tasks can potentially be specified through voluntary agreements or other negotiated frameworks, especially when dealing with trans-boundary ecosystem services. Formal and informal institutions outside the effective legal framework may be helpful in making markets more efficient and in reducing transaction costs⁵². This is particularly important in areas where property rights are not clearly defined, as transactions will only be able to occur through informal agreements.

Secondly, legal frameworks at local, national, or international levels can use regulations to impose certain caps on the depletion of natural resources and pollution. This could stimulate demand for ecosystem services if the framework allows emissions or resource use to be offset by purchasing ecosystem services from service providers. Again, the most prominent example here is the Kyoto Protocol and its Clean Development Mechanism.

Issues of legal frameworks and implementing institutions can be very country-specific and will need close attention when implementing projects at the international level. On the conceptual side, a discussion might be needed to determine whether or not global or regional frameworks like the UNFCCC and its Kyoto Protocol can be established for biodiversity and other ecosystem services besides carbon⁵³.

The issue of national sovereignty can become a potential source of contention when negotiating IPES. The investments in ecosystem services taking place in Costa Rica are starting to raise voices of concern about the encroachment of foreign interests (mainly by the intermediary of the World Bank) on the country's natural resources⁵⁴. Resistance to an 'internationalization' of natural resources is certainly to be expected and needs to be addressed if IPES are to become more common in the future.

3.2 Managing the Transactions

Distributing the Payments

Establishing a well-functioning market for ecosystem services is dependent on the capacity to distribute the payments efficiently. Private deals that are established on a voluntary basis do not face any complications in this regard. However, publicly managed payments schemes and cap-and-trade programs⁵³ need to be aware of the distribution mechanisms when designing PES and IPES.

Market mechanisms such as auctions or reverse-auctions (tenders) have been used in certain cases to facilitate the allocation of payments and present significant advantages in terms of efficiency. Using such mechanisms can also facilitate the valuation process by allowing markets to determine the price of a given ecosystem service. Furthermore, by organizing auctions, especially with farmers, PES are less prone to criticism coming from observers who see such programs merely as trade-distorting agricultural subsidies. Finally, market mechanisms can also limit transaction and implementation costs. In certain cases, it may be more efficient to organize an auction to determine payments levels instead of using a point or index system (which are often difficult to implement in terms of valuing biodiversity).

⁵¹ Savy, C.E. & Turpie, J.K. (2004), op. cit.

⁵² Kumar, P. (2005), op. cit.

⁵³ Loreau, M. & Oteng-Yeboah, A. (2006) *Diversity Without Representation*, Nature, Vol.442, 20 July 2006.

⁵⁴ Baltodano, J. (2004), op. cit.

Form of Payments

When designing PES schemes, one has to carefully deliberate the form in which the payments are to be made. Suggested currencies include money, technology, or goods and services⁵⁵. Clearly, the form of payment may alter the incentives and effects of a PES scheme on both potential buyers and sellers⁵⁶. Cash is the most flexible currency and seems to be appropriate when ecosystem services suppliers forgo cash income by providing the services. It can be appropriate for companies or even governments that want to sell their ecosystem services. In this context, debt-for-nature swaps may also be considered.

However, development practitioners fear that money payments may be a problematic approach when dealing with rural communities who may lack the education and experience to use the newly acquired funds wisely. Therefore, using in-kind compensation for provision of ecosystem services may in some cases be more appropriate. At the regional and international levels in particular, transfers of technology in return for ecosystem conservation may be an option that could help ensure sustainability.

Potential buyers might also be sensitive to the payment currency. While donor governments may be interested in offering debt-for-nature swaps or in combining development aid projects using technology transfer with PES schemes, private sector investment in ecosystem services may prefer cash payments for the sake of simplicity (and avoidance of further liability). Future work on this field needs to take a closer look at the incentive structure of the various currencies for sellers and buyers, how those fit in the general conservation goals, and whether or not they conflict with any of the MDGs. Also, the necessary institutional change that would have to go along with the use of in-kind or technology transfer payments needs to be analyzed.

Permanence of Payments

When establishing PES schemes, the permanence of payments can become a significant issue. The duration of a contract can have a strong influence on the type of service that will be provided. In the case of carbon sequestration contracts, for example, forests could be cut down as soon as the transaction has been completed. Such situations are particularly prone to happen if the demand for the ecosystem service is insufficient to meet the supply.

However, it may be that the present value profits of alternative land uses do not differ by much, in which case a one-time payment may tip the balance and can induce land users to change their behavior for good, especially if an investment is necessary in that conversion process⁵⁷.

In general, however, payment schemes for ecosystem services should try to incorporate some kind of mechanism to make payments continuous and contingent upon compliance by the seller⁵⁸. A possible solution at the global scale would be to create schemes in which providers of biodiversity or carbon services can rent out some form of credits. Buyers would need to always hold carbon or biodiversity permits equal to their past emissions or induced biodiversity loss. Service providers would gain some flexibility to convert land as they wish, while brokers could combine temporary credits into long-term permits and sell them to the buyers. For PES projects that are funded by

⁵⁵ Perelet, R. (2005) *Towards Sustainable use of Ecosystem Goods and Services: Economic Issues* document prepared for the Central and Eastern European Regional Expert Workshop on Sustainable Use of Biodiversity, Moscow, May 30 to June 2, 2005.

⁵⁶ Wunder, S. (2005), op. cit.

⁵⁷ Pagiola, S. et al (2004), op. cit.

⁵⁸ Wunder, S. (2005), op. cit.

governments or NGOs, it is conceivable to install a fund and only use the interest to make continuous payments to the service providers.

Monitoring and evaluation

In the case where the beneficiary of a service can directly observe the delivery of the service (e.g. the downstream water user who depends directly on the managed flow of water), monitoring and enforcement are quite straightforward. The beneficiary will simply cease payments if the service is not delivered (breach of contract). However, other services may require outside monitoring or some other monitoring mechanism to ensure delivery. This is the case for the Kyoto Protocol, where emission abatement needs to be certified before an emission permit is issued. The same will probably need to apply for most PES schemes where demand is induced through governmental regulation.

Voluntary schemes might also benefit from a monitoring mechanism so that potential buyers are not required to monitor the transactions themselves, because it might often be inefficient or even impossible to do so, especially if PES schemes are to be implemented at the international level. More experiments and case studies on the issue of monitoring may be needed to find workable solutions⁵⁹. In this context, it may also be helpful to further explore more elaborate monitoring tools and techniques such as Geographical Information Systems (GIS) and remote sensing⁶⁰.

Just as the delivery of services needs to be monitored within a particular PES scheme, there has also been discussion concerning the monitoring and evaluation of PES projects themselves. While many resources are invested in the design and implementation of PES-like schemes, the evaluation of the successes receives much less attention⁶¹.

It has been argued that some of the money flowing into the creation of payment schemes should be used to run some case study experiments and quasi-experiments using advanced statistical techniques in order to assess the effectiveness of PES schemes and the conditions necessary for their success⁶². The gathered data could enhance the work related to PES in general. In addition, some simpler and easy-to-apply guidelines for project evaluation, which help project implementing organizations to rigorously assess their efforts and improve efficiency, may need to be developed.

3.3 Distributional Issues

Equitable participation

An important consideration that needs to be explored when thinking about how best to implement IPES is the issue of equity. Indeed, if PES are to become an increasingly popular environmental policy tool, the social consequences need to be taken into account. It is actually in the best interest of PES supporters to strive for the broadest possible participation in order to adequately support growing markets for ecosystem services.

While economies of scale and lower transaction costs can certainly be achieved by favoring large PES contracts, many key stakeholders could become marginalized in the process. Here, the issue of property rights could be determinant in ensuring equitable participation, potentially excluding

⁵⁹ ten Kate, K., Bishop, J. & Bayon, R. (2004), op. cit.

⁶⁰ Kerr, J.T. & Ostrovsky, M. (2003), *From Space to Species: Ecological Applications of Remote Sensing*, Trends in Ecology and Evolution, Vol. 18 No. 6, June 2003.

⁶¹ Ferraro, P.J. & Pattanayak, J.K. (2006), *Money for Nothing? A Call for Empirical Evaluation of Biodiversity Conservation Investments*, Plos Biology, April 2006, available at: http://biology.plosjournals.org/archive/1545-7885/4/4/pdf/10.1371_journal.pbio.0040105-L.pdf

⁶² Kerr, J.T. & Ostrovsky, M. (2003), op. cit.

landowners who do not hold proper land titles. Consequently, the conservation of areas where property rights are not clearly defined becomes impossible.

Also on the subject of participation, institutions implementing PES schemes need to be wary of the free-rider problem, which is often present when dealing with public goods and services. An example is the tourism industry, which benefits directly from beautiful and diverse landscapes. If PES schemes are to grow at the global scale, then key beneficiaries such as tour operators and hotels will need to be tapped into.

PES and the poor

Many aspects of PES schemes suggest that their broader application can actually help reduce poverty. First of all, it has been noted that by the very nature of the system, participation in PES schemes is purely voluntary, and therefore nobody should be worse off than they were without PES⁶³. However, this does not mean that inequalities cannot become exacerbated through a poorly designed payments system. Indeed, if a payment scheme were to mainly reward wealthy landowners as opposed to lower income households, it cannot be considered a pro-poor policy.

Nevertheless, payment platforms constitute a new source of income and increase welfare, particularly because PES schemes can help transfer money from urban to rural areas⁶⁴. Also, land use change may help alleviate pressures on local ecosystems and may also reduce ‘tragedy of the commons’ effects. For instance, PES schemes may give poor communities the incentive to manage their formerly heavily overgrazed common land more sustainably. While they get compensation for reducing soil degradation under the PES scheme, they also benefit from an increased profit per grazing animal. Thus, overcoming ‘tragedy of the commons’ effects can potentially increase income even for non-participants. Some further positive externalities of PES, such as the creation of social capital have also been recently suggested⁶⁵.

There are, however, some concerns regarding the effects of PES systems on the poor. People can only benefit from new markets if they have access to them, which may often not be the case, especially for the poor and uneducated⁶⁶. Also, companies may try to reap the benefit of payments under PES schemes, which can be particularly problematic if land users do not own clear property rights for their land. Another concern is that successful PES systems may result in reduced access to forest lands for local communities who may depend on gathering non-timber products from forests⁶⁷.

When talking about PES and the poor, those who want to promote the broader use of PES schemes also need to be ready to address the harsh critique from the side of certain conservation groups and globalization critics. Many are very critical toward assigning a monetary value to nature, and fear that the privatization of natural assets may have detrimental effects on both nature and the poor⁶⁸.

A serious concern with the valuation and commodification of natural resources is that it cannot fully capture the interconnectedness between ecosystems and the local communities⁶⁹. Further work on IPES schemes and their effects on the poor, on how to make PES schemes more pro-poor, and on

⁶³ Pagiola, S, Arcenas, A. & Platais, G. (2005) *Can Payments for Environmental Services Help Reduce Poverty? An Exploration of the Issues and the Evidence to Date from Latin America*, World Development, Vol. 33, No. 2., 2005.

⁶⁴ Gutman, P. (2006), op. cit.

⁶⁵ Pagiola, S, Arcenas, A. & Platais, G. (2005), op. cit.

⁶⁶ Landell-Mills, N. & I T Porras, I.T. (2002), op. cit.

⁶⁷ Pagiola, S, Arcenas, A. & Platais, G. (2005), op. cit.

⁶⁸ GRAIN (2005) *No, air, don't sell yourself ...*, Seedling, April 2005. <http://www.grain.org/seedling/?id=332>

⁶⁹ Global Forest Coalition (2006), *You Cannot Save It if you Cannot Sell It?: How Environmental Services Markets Impoverish People*, Briefing on Environmental Services Markets, August 2006.

how to generally incorporate the MDGs into IPES activities are important goals that should not be overlooked and may even be helpful for raising political support.

Part III – Tasks for the Future

Having discussed the main challenges and open questions in the previous section, this next part will make suggestions for specific steps that need to be taken in order to promote the development of PES schemes, potentially at regional and international levels, and to ensure the long-term provision of ecosystem services to humanity.

1. Addressing Challenges and Open Questions

Some issues may be conceptual or related to frameworks and need to be dealt with up front. This may be particularly relevant when trying to operate at the trans-boundary and international levels. Other aspects may be best resolved in due course or in the context of new case studies and projects.

How much regulation?

A key question that needs to be addressed as a starting point for the implementation of IPES is the role that regulations need to play. Do we need independent markets for ecosystem services (MES), or a combination of market-based and regulatory mechanisms (cap-and-trade) as a first step? When dealing with purely voluntary markets for ecosystem services, it is feasible to leave the valuation completely to the buyer of the service and it is hence relevant to understand the specific demand for well-defined ecosystem services⁷⁰. On the other hand, when government regulation is used to induce demand, it is more relevant to assess the value of ecosystem services to society in general to be able to find the right target of service provision⁷¹. The designers of IPES will need to consider how regulations might affect the payments before they decide on how they can be instituted.

Some would argue that one should not have to choose between markets and regulations, but should rather look for “the optimal combination of market, hierarchical and cooperative systems” for managing ecosystems⁷².

A continued dialogue between policy makers, researchers, and the key stakeholders of payment schemes needs to be maintained in order to communicate the lessons learned from various projects around the world. Payments for ecosystem services cannot be seen as a ‘one-size-fits-all’ solution to environmental problems, and should rather be seen as a complement to other efforts that are perhaps more attuned to the context-specific issues.

Framing biodiversity-related services

Biodiversity-related services could become the central focus of efforts aiming to increase international payments for ecosystem services. There are already several mechanisms in place that could facilitate the expansion of these markets, such as bioprospecting rights, payments for ecotourism uses, and trading in biodiversity credits⁷³. Building upon these already existing mechanisms could become an important component in the development of IPES.

⁷⁰ Pagiola, S. & Platais, G. (2002), op. cit.

⁷¹ Kumar, P. (2005), op. cit.

⁷² Landell-Mills & Porras (2002), op. cit.

⁷³ ten Kate, K., Bishop, J. & Bayon, R. (2004), op. cit.

However, biodiversity is surely the most difficult ecosystem service to adequately value. It is in fact very difficult to “commodify” biodiversity, and it is equally difficult to pinpoint exactly what we it is exactly we are trying to value (ecosystems, species, genes)⁷⁴. More work on finding ways of adequately measuring and valuing biodiversity-related ecosystem services will need to be developed before we can expect payments to become widespread.

2. Coordinating at the International Level

Many institutions, NGOs, governments, and companies are working on PES schemes. An increasing number of PES or PES-like projects are being implemented throughout the world and the knowledge available is increasing. However, most PES efforts are using the local approach (the Kyoto Protocol being the main exception), because it is seen as the most promising (e.g. for watershed services), or because of lacking funds or institutional capacity to operate at regional or international levels.

Scaling up PES efforts to the international level can be beneficial in various ways. Firstly, the increased international coordination across institutions, governments, organizations, and the private sector can create synergies. Lessons learned can be shared among interested parties, expertise can be combined for joined efforts, and resources can be targeted more effectively. Secondly, operating at the international level can raise awareness and increase the likelihood of large corporations getting involved in the process. A salient example is the Katoomba Group and its Ecosystem Marketplace⁷⁵. Thirdly, and maybe most importantly, many ecosystem services are of global importance and may need globally orchestrated activities to ensure their sustainable provision – at least in the long run. The Clean Development Mechanism of the Kyoto Protocol, which deals with carbon sequestration services, can perhaps serve as a reference for efforts in the fields of biodiversity and other services.

For future efforts to be successful it is important to explore in what way and to what extent international systems of payments for and trading of ecosystem services (as exists for carbon under the Kyoto Protocol) are a sensible approach. For biodiversity services especially, local adaptation within any international framework of coordination may be very important. In general, international efforts should aim at creating synergies and increasing impact while taking local needs into account⁷⁶.

3. Consolidating and Creating Demand

Even though there exists a considerable demand for ecosystem services today, and even though this demand appears to be increasing over time, there may be a need to adopt measures to create more of it⁷⁷. Further initiatives to promote the broader application of PES schemes at the regional and international levels could be fueled by such new demand.

Raising public awareness

Various options should be considered to increase the knowledge of PES and to channel the willingness to pay of potential buyers. Well-targeted marketing can raise the awareness of private consumers as well as companies and governments, thus increasing voluntary demand for ecosystem

⁷⁴ Adapted from an Ecosystem Marketplace Power Point presentation given during the International Conference on Eco-compensation Mechanisms, Beijing, August 2006.

⁷⁵ www.katoombagroup.org and www.ecosystemmarketplace.com

⁷⁶ This has been mentioned for example in ten Kate, K., Bishop, J. & Bayon, R. (2004), op. cit.

⁷⁷ Jenkins, M., Scherr, S.J. & Inbar, M. (2004), op. cit.; and Gutman, P. (2006), op. cit.

services⁷⁸. Accompanying measures to organize potential buyers and to offer them assistance in purchasing ecosystem services (such as eco-labeling for private consumers, or trading platforms for businesses and governments) should be adopted.

The private sector's knowledge on marketing campaigns will be valuable for efforts aiming at raising awareness. Relevant partners are also conservation NGOs who can create pressure by publicizing lists of companies with poor environmental standards, as well as lists of best practices. Also, conservation NGO's interested in seeing PES develop further can generate awareness through outreach and educational campaigns. Working with the media and even the entertainment industry is an approach commonly used by environmental NGO's, and could be an important way of disseminating information on ecosystem services.

Gaining political support

If payment and trading platform schemes are to be used more intensely in the future and for a variety of ecosystem services at local, regional, and international levels, political support needs to be increased. For this, governments need to become more familiar with the concept of ecosystem services and how it can be used as an environmental policy tool.

Gaining government support can be essential to the functioning of IPES schemes for various reasons. Firstly, the cooperation of governments of countries that provide ecosystem services is needed when implementing local projects. Their support is necessary to clarify issues of property rights and legal frameworks, and existing government institutions and agencies may be a valuable asset of overall institutional capacity. Secondly, governments, especially those of developed countries, are potential buyers of ecosystem services. For example, debt-for-nature swaps can be a potential funding source for PES schemes. Thirdly, any effort to create demand through regulation will need government support, in particular if international frameworks like the Kyoto Protocol are to one day be established for other ecosystem services such as biodiversity.

Future work should also aim at getting the private sector more involved, and considering private companies as key stakeholders in the process of implementing PES and IPES. Information exchanges between environmentalists and capitalists can indeed be valuable. The private sector holds tremendous knowledge on market functioning and market creation⁷⁹, while environmental organizations can provide valuable expertise when it comes to project implementation, monitoring and evaluation, and setting conservation priorities. Companies seem to value this information highly⁸⁰, and their interest in conservation can only grow as payments for ecosystem services become more and more widespread. In the case of trying to establish regulative legislation to induce demand, the vested interests of businesses need to be overcome.

Future initiatives should aim at consolidating the rising demand. It will be necessary to get a better understanding of the structure and magnitude of the willingness to pay in order to design projects and frameworks accordingly. Increased cooperation and information exchange with the private sector, governments, relevant NGOs, and other potential buyers can help assess and channel the existing demand for ecosystem services, thus giving opportunities to create new markets. It has been stressed that in order for ecosystem markets to flourish, it is particularly important for them to be demand-driven⁸¹.

⁷⁸ Gutman, P. (2006), op. cit.

⁷⁹ Ibid.

⁸⁰ ten Kate, K., Bishop, J. & Bayon, R. (2004), op. cit.

⁸¹ Bishop, J., IUCN, private communication, August 2006.

4. Developing Pilot Projects

Organizations interested in the broader application of PES schemes should orchestrate their efforts in order to create synergies and avoid competition. Lessons from past and ongoing efforts should be incorporated as much as possible, and these should be complemented with the design and implementation of pilot projects in fields where exploration is necessary.

Many projects exist at the local level, mostly covering watershed, carbon, and biodiversity services. However, with the exception of carbon services, there exists little experience on PES schemes at the international level. Services that are of global importance and that are not yet captured in international PES schemes should therefore receive more attention in the future. For example, an open global trading platform for biodiversity-related ecosystem services operating under existing demand could be created as a pilot project to gain relevant experience for further application of international PES schemes to biodiversity.

Another approach relating to biodiversity services could be to partner with the ‘Like-Minded Megadiverse Countries’ and explore possibilities of creating new markets. The 12 Like-Minded Megadiverse Countries host nearly 70% of the world’s genetic resources and have agreed in Cancun in 2002 to join their efforts to “promote and safeguard the fair and equitable sharing of benefits arising from the use of biodiversity and its components”⁸².

5. Identifying Leading Institutions and Building Capacity

As seen in Part II, important challenges in the scientific, technical, institutional, and political realms need to be addressed when thinking about ways of expanding PES schemes to the international level. In order to be most efficient in the promotion of IPES schemes, it is important to identify the relative priorities of the open questions and to develop an appropriate sequencing of actions to be taken.

Once the necessary next steps to further the application of PES at the regional and international levels have been identified (such as which challenges need to be addressed, how to consolidate and create demand, what pilot projects should be started) it will be necessary to develop a clear action plan of how and in what sequence these steps can be taken. Such an agenda would include identifying the leading institutions relevant for PES design and implementation and distributing responsibilities among them according to capacity.

Within the objectives of reducing overall transaction costs related to the implementation of IPES schemes and limiting the financial risks involved, new institutions might also need to be created⁸³. Here, a continued dialogue between market and environmental experts⁸⁴ will be necessary in order to assure a sustainable and efficient regime.

⁸² Cancun Declaration of Like-Minded Megadiverse Countries, 2002, available at http://www.unido.org/file-storage/download/?file_id=11803

⁸³ Sherr, S., White, A. & Khare, A. (2004), op. cit.

⁸⁴ Some organizations that could potentially take a leading role in this continued dialogue could include, but are not limited to, the Katoomba Group and its Ecosystem Marketplace, the Convention on Biological Diversity with its clearing house mechanism, the World Bank and the Global Environment Facility (GEF), the World Wide Fund (WWF), as well as potential partnerships between UNEP and IUCN.

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