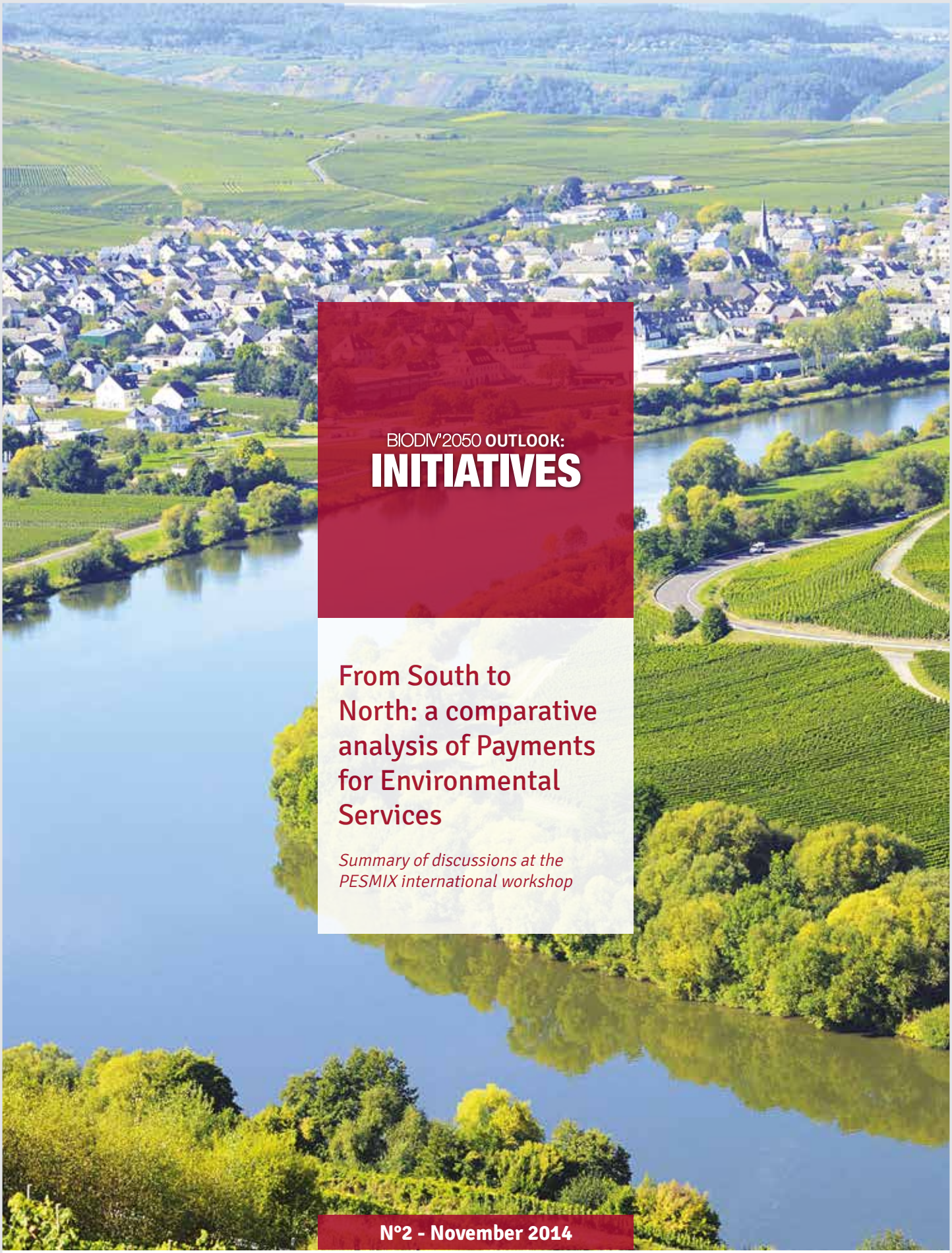

BIODIV'2050 **OUTLOOK:**

INITIATIVES

From South to North: a comparative analysis of Payments for Environmental Services

Summary of discussions at the PESMIX international workshop

N°2 - November 2014

MISSION ÉCONOMIE DE LA BIODIVERSITÉ

Pesmix

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CONTENT

PESMIX international workshop
Montpellier,
11, 12 & 13 June 2014

With the support of

AUTHORS : A. KARSENTY, A. GUINGAND, A. LANGLAIS ET M.C. POLGE
EXECUTIVE EDITOR: LAURENT PIERMONT
EDITOR IN CHIEF: PHILIPPE THIEVENT
GRAPHIC DESIGN: JOSEPH ISIRDI - www.lisajoseph.fr
CONTACT : meb@cdc-biodiversite.fr

SPEAKERS (order of presentation):

- **Alain Karsenty** *(Cirad, Montpellier)*, « What are the PES? Concepts and controversies »
- **Stefanie Engel** *(ETH, Zurich)*, « What have we learnt on designing PES? A critical economist's view »
- **Arild Vatn** *(Norwegian University of Life Science)*, « Environmental Governance – Are Markets the Solution? »
- **Denis Couvet** *(Museum National Histoire Naturelle, Paris)*, « Biodiversity conservation and ecosystem services »
- **Alexandra Langlais** *(Université de Rennes I – CNRS - IODE)*, « Legal stakes and issues around PES »
- **Virginie Maris** *(CEFE-CNRS, Montpellier)*, « What nature and what equity in PES? »
- **Romain Pirard** *(Cifor, Indonésie)*, « Market-based instruments for Ecosystem Services : A rough guide to the literature jungle »
- **Judicaël Fétiveau** *(Gret, Paris)*, « Innovative Financial Mechanisms for Biodiversity »
- **Thomas Legrand** *(Banque Africaine de Développement)*, **Romain Pirard**, **Judicaël Fétiveau**, **Alexandra Langlais**, **Virginie Maris**: Roundtable « PES, commodification and financing of biodiversity »
- **Céline Dutilly** *(Cirad, Montpellier)*, « The PSA-H of Yucatán, Mexico: from the specificities of implementation to the assessment of impacts. Some results of the Pesmix project. »
- **Juan Manuel Torres Rojo** *(CIDE, Mexique)*, « The future of PES in Mexico and their interactions with other public program »
- **David Barton** *(Norwegian Institute for Nature Research)*, « PES as a policymix »
- **Sigrid Aubert** *(Cirad, Madagascar)*, « Public service and PES: the terms of the integration of forest resources management instruments in Madagascar »
- **Benjamin Landreau** *(GreenEcoLand, France)*, « Government programme 'Socio Bosque' in Ecuador: presentation and analysis of the first initiative of national PES in South America »
- **Unai Pascual** *(Basque Center for Climate Change)*, « Social equity matters in Payments for Ecosystem Services »
- **Alejandro Guevara** *(Université IberoAmerica, Mexique)*, **Renaud Lapeyre** *(Iddri, France)*, **Géraldine Froger** *(UVSQ, France)*, **Romaine Ramananarivo** *(Université Antananarivo, Madagascar)*, **Martine Antona** *(Cirad, Montpellier)*, Roundtable: « Are PES environmental or development instruments? »
- **Laurent Piermont** *(Mission Économie de la Biodiversité - CDC Biodiversité, Paris)*: Introduction to Day Three
- **Bernard Labat** *(Humanité et Biodiversité, Paris)*, « How can law contribute to the PES implementation? »
- **Philippe Billet** *(Université de Lyon 3)*, « The legal status of ecosystem services provided by pollinators »
- **Isabelle Doussan** *(CREDECO-CNRS, Nice)*, **Nathalie Hervé-Fournereau** *(Université de Rennes I – CNRS – IODE)*, **Bernard Labat**, **Philippe Billet**, **Alexandra Langlais** : Roundtable of Lawyers
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How to combine Payments for Environmental Services with legal and economic instruments in the South and the North?
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Introduction

Payments for Environmental Services (PES) are increasingly used as incentives for the conservation of natural resources in environmental and development policies. The general principle is to compensate persons whose behaviour or practices contribute to environmental preservation.

Experiments with PES have increased in the last 20 years in both the South and the North because of its great appeal to the international community (the main donors) and the civil society. The wealth of research, the accelerated policy design and emblematic case studies have contributed to its popularity.

But behind the generic term PES and the intuitive simplicity of the principle lies a complex amalgamation of instruments, different in both nature and objectives, promoted by parties of various sorts and implemented at the local, national and even international level. As the number of projects rose, the original economic logic based on a comparison of cost-benefit ratios for different uses of the land, had to cope with reality when the instrument was applied in the field where the stakes of actors' interactions, institutional structures, agents' motivations and ecosystem dynamics are decisive. The field experience meant confronting legal requirement especially since PES relies on legal decisions to settle issues among the actors and between the actors and nature.

Moreover, questions on PES implementation, that were common to all the disciplines represented at the workshop (namely scale of action, stimulating actor involvement, nature of payments, equity, etc.), led to other, more profound questions on the definition and philosophy of PES by considering its level of standardisation, its inventiveness, its nature as an economic tool and even its veritable goal/motivation.

To identify answers to these questions and to build up the premises for a multidisciplinary view of PES, an international workshop entitled "Combining Payments for Environmental Services to legal and economic instruments in the South and in the North?" was organised by Cirad and the *Mission Économie de la Biodiversité* of the *Caisse des dépôts* as part of the PESMIX research project on 11, 12 and 13 June 2014 in Montpellier. The workshop received support from the Languedoc-Roussillon region, the INVALUABLE project, Novethic, Gret, the ANR SERENA project, the POLICY MIX project, the BIODISCEE network from INEE CNRS and the French Society for Environmental Law.

Over 100 participants (economists, lawyers, ecologists, political scientists, philosophers, policy makers, business companies and NGOs) from both the North and the South attended the workshop where the focus was on the present conceptual thought on PES, feedback on experiences with PES, and prospects for future development. This document is a summary of the information, questions and research issues considered at the meeting.

1 Payments for Environmental Services: definition, nature, objectives

Payments for which services?

Should PES have a standard definition or should PES be designed by the actors who implement them? The participants were interested in the actors' view and local practices of PES but felt that the issue of defining PES, theoretically, had to be addressed so that workshop discussions could be based on a common understanding of the main subject. Several participants tried to explain the concept.

Karsenty felt that PES is intended for persons who had rights over the spaces that they were using, spaces where the user practices had a direct impact on ecosystem services. In this definition, a distinction is made between environmental services resulting from human practices (services rendered by people to other people) and ecosystem services (direct and indirect benefits that people derive from nature - MEA 2005).

Mortelmans made this distinction when reporting on "input measures" (actions affecting the land) that affect "ecosystem output" (ecosystem services produced). The inspiration comes from the evaluation systems applied in the certification world, e.g. FSC, PEFC. The same distinction is implicit in the notion of "payments for the preservation of ecosystem services" proposed by Piermont and Guingand which is based on the implementation of a combination of actions (changes in farming and forestry practices, restoration of wetlands, etc.) at the level of a given territory, the goal being to conserve/restore previously defined ecosystem services.

The distinction between ecosystem services and environmental services can be used to explain why the former are, by nature, public goods (carbon fixation capacity, biodiversity, etc.) or collective goods (quality of water in a watershed, etc.) that cannot be appropriated (also noted by Maris), while environmental services are services rendered by people to people and thus can be organised in a number of ways (competition, cooperation, etc.). The decision to choose the notion of "payments for environmental services" rather than "payments for ecosystem services" recognises that the purpose of the transaction is to obtain payment for a specific land use and not to "purchase" an ecosystem service as such. For Langlais, maintaining this semantic ambiguity that tends to blend the means (human practices) with the results (in terms of maintaining of restoring the ecosystem services) decreases the legal applicability of the instrument since agreement among the actors will change depending on the object of the contract being environmental services or ecosystem services. This automatically conditions the legal responses. If the goal involves services that cannot be assessed, for instance, the contract for such services might be considered legally null and void. Cause and effect relations between manmade practices (often agriculture) and their ecological impacts are known to be scientifically uncertain. To overcome these uncertainties, PES is usually based on "proxies" (intermediary targets, usually a certain land use) rather than on results measured in terms of the quantity and quality of ecosystem services obtained (although these latter, in absolute terms, are still the ultimate goal of PES).

It is also essential to specify the types of ecosystem services that should be prioritised as goals for maintenance or restoration work. Couvet felt that the main challenge for this instrument was to focus on the preservation of regulation and support services that are not taken into account in present day commercial transactions (which are suffering from a worldwide decline), unlike the cultural and provisioning services which are generally seen to be stable or even improving.

Couvet pointed to the frequent clash between two goals: maximisation of provisioning services vs. maintenance of regulating and support services. The role of PES, thus, would be to reduce this antagonism by encouraging a new type of trade-off between ecosystem services. To increase the effectiveness and the sustainability of the environmental results, PES could include packages of services and incorporate the capacity for ecosystem adaptation in the mechanism via the concept of "evo-system" services. He also pointed to the synergy between biodiversity and regulating/support services. But using these elements will not be easy.

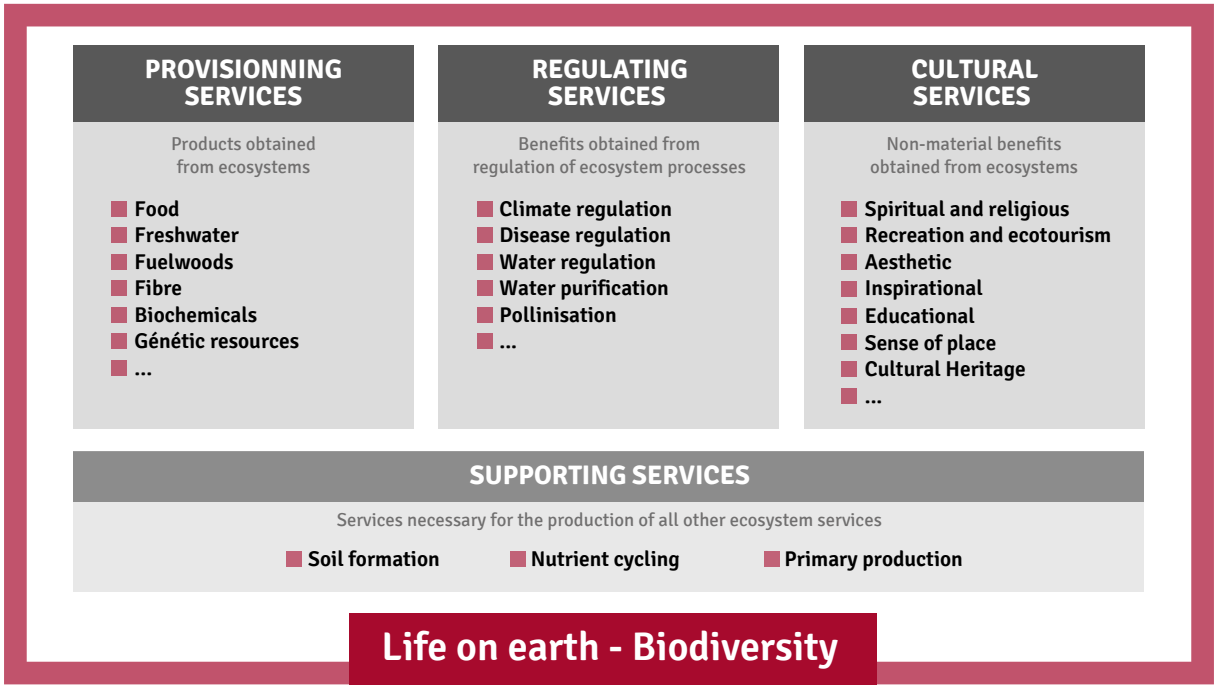


Fig.1. Ecosystem services accorded to the MEA (source: FAO, 2007, adapted from Ecosystems and human well-being: a framework for assessment par le Millennium Ecosystem Assessment, 2003)

Thus, to prevent a clash between the various ecosystem services and to avoid eliminating some of them, they could be bundled and financed by a single funding source. There are three options in this case (Mortelmans, referring to DEFRA):

- assign a price to a package of services (bundling);
- assign a price to each of the services individually (layering);
- assign a tariff to only one of the services, the others, thus, would be "free of charge" but would be connected to the services that are "sold" (piggy-backing);

With reference to piggy-backing, the underlying logic is that some ES are too complex to be "sold" separately (layering) or simply combined (bundling) hence it is preferable to focus on the ones that have more potential. This strategy is comparable to the use of flagship species in nature conservation projects where the focus, for instance, is on the protection of primates although the aim is also to protect many other animal species that live in the same habitat.

Is monetary valuation of ecosystem services a prerequisite to the implementation of PES?

Many people embrace ambiguous definitions, such as the famous one by Wunder (2005)[1] who uses commercial language and sees PES as a relationship between buyers and sellers of ecosystem services. From this starting point, researchers often seek to conduct an economic valuation of these services in order to determine the prices to offer the "suppliers" working under PES system. Langlais felt that the monetary value of ecosystem services that fall under PES contracts should be no more than a mere reference. One participant called this all paradoxical if we consider that the role of the market (in "standard" economics) is to formulate a price by weighing supply against demand[2]. But the existence of a price does not automatically mean that a market exists. It may reflect social and environmental values expressed in monetary terms. Lawyers commonly

(1) "(1) a voluntary transaction in which (2) a well-defined environmental service (or a land use likely to secure that service) (3) is "bought" by a (minimum of one) buyer (4) from a (minimum of one) provider (5) if and only if the provider continuously secures the provision of the service (conditionality)"

(2) This leads to the debate in economic sciences on the possibility that economic values can exist independent of the possibility to exchange them (see A. Orléan, *L'empire de la valeur, Refonder l'Économie*, Seuil, 2011).

use a price scale to assess the value of damage to the environment or other types of damage but this does not imply the use of marketplace logics.

Reality can be quite different. Pirard pointed out that in most cases, PES projects are implemented without a prior economic valuation of the value of the services (too expensive and uncertain). Many participants emphasised that the notion of opportunity cost (unearned net potential profits resulting from the abandonment of certain practices) is unrelated to the "total economic value" of the ecosystem services as a whole which economists try to determine – without reaching compatible results however, thus demonstrating the fragility of the methods used. Although in practice, payments are not aligned to opportunity costs (which change over time and are difficult to calculate at the community level where there are major socio-economic differences among the members), it is still a convenient theoretical reference for working out PES remuneration basis and, moreover, brings up the question of the originality of PES schemes.

Property rights as a central component for the PES approach and a criterion for identifying PES

Although the coexistence of a number of definitions and heterogeneous practices is normal, it is important to distinguish between the original features of this economic instrument and the mechanisms that have already been identified and analysed. For Karsenty, as mentioned previously, PES is intended for actors who are entitled to the land that they are using and whose practices have a direct impact on ecosystem services. Hence, "the conservation NGOs do not supply environmental services any more than the forestry services". This led to a discussion, stimulated by Billet's presentation, on the legal regime applied to pollinisation services. In France, a "pollinisation contract" consists in paying a bee-keeper to provide bee hives for a set period of time to farmers who want honey bees to pollinise their orchards. Billet spoke of the ambiguity of such a contract since payment is granted for supplying the bees but not for the pollinisation service itself (another way of stressing the importance of distinguishing between the environmental service rendered by the bee-keeper and the ecosystem service rendered by the bees).

For Karsenty, this type of contract – which sounds similar to the "manure contracts" still common in the developing countries – cannot be analysed in terms of PES since the bee hives are put on the paying farmer's land and therefore are part of a standard commercial transaction (with environmental implications). Otherwise a gardener who plants trees on his employer's land (or on public land) would be entitled to PES. In sum, a distinction needs to be made between a service rendered on the lands of a third party and an owner's decision to use (or not to use) his property rights in responding to a contract proposal (this is a key issue for PES). The question of the breakdown and contents of property rights is central to the problem of PES, a point at the core of Coase's proposal in 1960 ("The Problem of Social Cost") that is recognised as the conceptual origin of PES. It allows to distinguish PES from other commercial transactions with an environmental component.

PES is intended for actors who are entitled to the land that they are using and whose practices have a direct impact on ecosystem services.

All these criteria need to be discussed and involve the broader question of the originality of PES. How does it differ from existing tools? From a legal angle, do its unique features justify the creation of a new legal category governed by a new legal regime?

Are PES market-based instruments?

In the scientific literature, PES is often seen as a market-based instrument which commentators, depending on their ideology, either love or hate.

Pirard and Lapeyre analysed what specialised literature calls "market-based instruments", which often include PES. But in this literature, PES usually refers to Coasian type agreements (bilateral negotiations between the owners of property rights – understood to mean the right to carry out certain actions – to provide compensation for the exercise or suspension of certain rights that cause negative externalities). Pirard and Lapeyre felt that it is often more important to analyse the various principles (subsidies, markets, taxes, auctions, etc.) that underlie the instruments which do not actually

constitute homogeneous or mutually exclusive categories. They recommended differentiating the characteristics of market-based instruments according to their funding methods (voluntary or compulsory, public or private), their incentives system, and the supplier selection mechanism (bilateral methods or selection by reverse auction). These distinctions are also relevant in analysing the nature of the mechanism, which can be called PES as a generic term.

A distinction can also be made between markets characterised by a multilateral governance system on the one hand and payments often made through a bilateral system by public and State organisms for a given amount that is independent of the market, on the other (Vatn). Vatn, and many other authors felt that PES in general do not depend on the market because 90% concern public goods that markets often manage inefficiently (free-rider phenomenon) and 99% of them (those concerning public goods) receive public funding.

Several participants noted that bilateral contracts in a PES system are not interchangeable (no possible competition between service suppliers for actions to ensure the water quality for instance). Each operation, or contract is unique because it depends on parameters specific to a given space. Hence there is no tradable ecosystem services unit (Maris); this makes PES different from market-based instruments. PES should be seen more as a regulatory mechanism with incentives promoted by public institutions (Maris).

Vatn recommended the term "economic instruments" that are divided into "strictly public instruments" and "market-based instruments". He felt that PES connected to the carbon credit transactions, especially under the "cap-and-trade" mechanisms fall under "market-based instruments". This point is more finely honed by Karsenty who referred to the proposed definition of the market in old and neo institutional economics. According to this school of thought, market is seen mainly as a place for trading property rights, extended to mean "the right to carry out a given list of actions" (quotation from Coase). But "carbon PES" involves the production of "emission reduction certificates" (carbon credits) with two highly differentiated compartments: the bilateral PES without any exchange of goods (agreement to suspend user rights or use the land as a plantation)

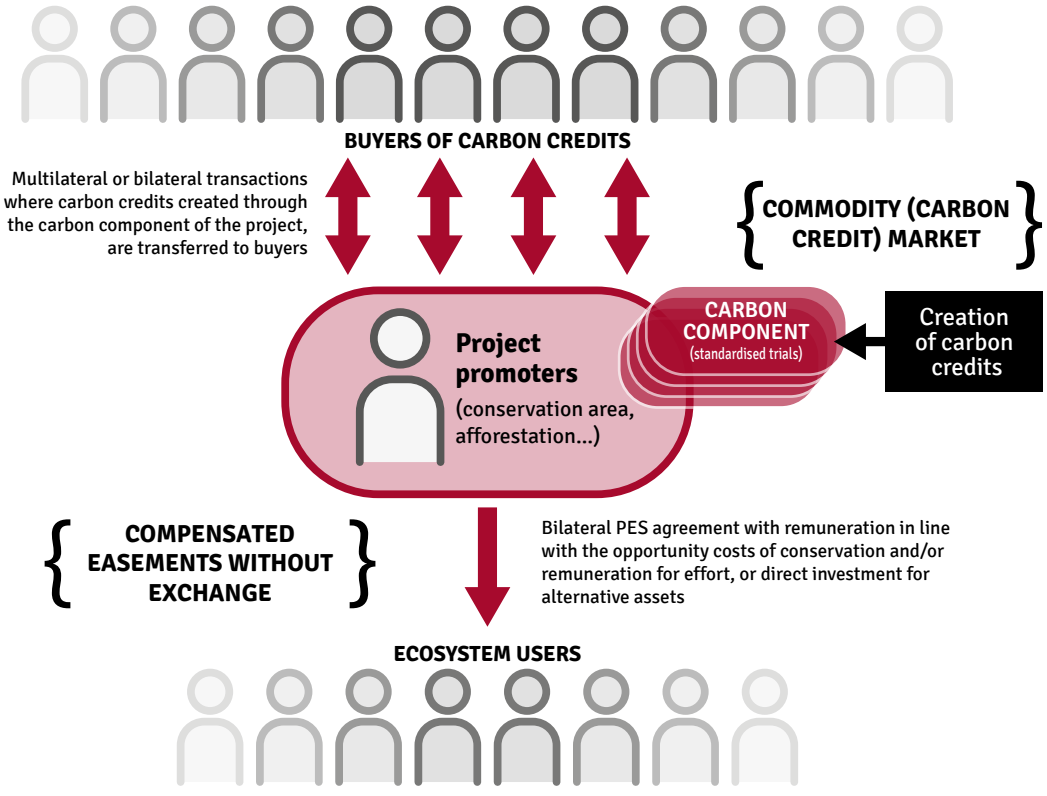


Fig.2. Difference between REDD+ projects and ("market-backed") PES (Karsenty)

and the REDD+ process (especially the eponymous projects) in which "the commodity" is obtained ("fabricated") through a long, costly procedure. The commodity can then be traded on the carbon market. These two processes can be entirely separate. Some PES have a carbon component but do not generate credit emissions and some REDD+ projects do not include PES. When the two are connected, Karsenty feels we can talk about "market-backed PES" – to use Pirard's expression – but not about a market-based instrument. And hence, he feels, that analysing PES through REDD+ modalities (proposed by V. Maris) is not totally relevant.

Similarly, with the emergence of offset mechanisms for biodiversity impacts derived from development projects, Levrel suggested differentiating between these mechanisms and PES since the underlying logic is different: polluter pays principle and results-based conditionality for offsets on the one hand, beneficiary pays principle and activities-based conditionality for PES, on the other.

Concerning the risk that PES contribute to the "commodification of nature", Karsenty refuted this often mentioned criticism by referring to the intrinsic public/collective (and hence non appropriable) nature of ecosystem services. Maris, who used the REDD+ example to analyse PES, felt nonetheless that the concepts of "ecosystem service" and "payments for ecosystem services" are anthropocentric and reduce the functioning of ecosystems to an economic vision of nature.

The "ecosystem services market" metaphor is often heard but does not reflect the real nature of PES. It may also have political effects. Landreau said that in Ecuador, the Constitution stipulates that environmental services shall not be appropriated and the government, fearing the "commodification of nature" has outlawed the term "PES". The word "payment" has been replaced by the word "incentive", but the programme, as an instrument of environmental public policy, has the characteristics of a national PES. Similarly, according to Mortelmans, in Flanders, the term "market-based instrument" has been replaced by "voluntary economic instrument for the suppliers".

The "ecosystem services market" metaphor does not reflect the real nature of PES.

PES and the "eviction effect"

Karsenty pointed to the main problem of PES, namely that the actors may question their personal intrinsic motivations for protecting nature. In the literature, the possibility of eliminating selfless reasons to protect nature is called the "crowding out" risk (Vatn, Engel). Engel considers "crowding out" to be more probable when trust, social norms and reciprocity are strong. When rules are imposed unilaterally (top-down) the risk of crowding out is higher. Torres Rojo explained that different types of ecological blackmail had been observed in Mexico.

Another effect of this potential eviction, or crowding out is connected to the application of current laws. If PES is used to pay actors to merely apply existing laws and regulations, it may become difficult to convince people to apply certain compulsory regulations connected to the environment without providing a financial incentive.

But the need for solidarity to fulfil conservation contracts may revive collective actions within communities, as suggested in certain studies from South America (Karsenty). Torres Rojo explained that the Mexican national PES-H (water) programme generated co-benefits through greater collective conservation actions in the forest and greater cooperation in fighting forest fires and illegal exploitation.

2 Difference in PES in the North and in the South

In the countries of the South, PES are mainly intended for forest, especially tropical rainforest conservation, but also to maintain water quality. Programmes often cover territories, sometimes even whole countries. Torres Rojo cited the case of Mexico where the government programme (PSA-H) seeks to offset the opportunity costs connected to forestland conservation, on the one hand, and the expenses incurred to establish good forest management practices, on the other. In Ecuador, according to Landreau, the national programme called *"Socio Bosque"* (PSB) has three goals: protect a large forest area, reduce national deforestation and emissions of greenhouse gases, and improve the living conditions of the population. The idea put forth, with support from the President is that "the programme is an investment, not an expenditure". In Madagascar, PES were used in small catchment basins to run micro-hydroelectric power stations. The REDD+ projects implemented by international NGOs in the new protected areas of the *Grande Île* use constraints (controls) and the development of revenue-generating activities for the local populations more than the conditional incentives that characterise PES.

PES experiences reported at the workshop in countries of the North focused mainly on water quality, recharging aquifers, fighting erosion, and habitat protection and restoration. Levrel described the United States Wetlands Reserve Program (WRP), a voluntary federal programme that offers landowners the opportunity to receive payment for the upkeep and restoration of the wetlands (functions, values, habitats) located on their property. To offset the establishment of environmental obligations that consolidate the ecological vocation of the lands, the WRP covers the total or partial costs of maintaining and restoring the wetlands and costs related to placing an easement on them. WRP has begun about 20 years ago and has ensured the protection of over a million hectares of wetlands that are managed by 11,000 landowners.

In Europe, besides the agro-environmental measures applied through the Common Agricultural Policy (CAP) and symbolic cases of PES in Munich (Germany) and Vittel (France), initiatives have been launched slowly but surely in well-defined territories. Strosser presented two cases. The first was the *Scottish Water Sustainable Land Management Incentive Scheme* (SLMIS) run by *Scottish Water,* a public body in charge of supplying water to households and business companies in Scotland. This programme, which is composed of six catchment areas where pollution from agriculture is a problem, is offering fixed-sum payments to farmers who commit to respecting certain practices (limited use of pesticides and nitrates, for instance) that are stricter than the current regulations. In north-eastern Spain, discussions are underway for a project on restoring the hydrographic regime of the Ebro River. This project involves a voluntary agreement between the company responsible for managing the two hydropower dams and the region's public authorities on controlled water delivery, the aim being to limit the presence of macrophytes downstream in the river channel. Examples from Finland, Norway (Barton) and Belgium (Mortelmans) were also presented. Piermont and Guingand gave a few examples of contracts between farmers and local public officials to encourage preventive solutions (limited used of inputs, transition to organic farming, changes in cropping techniques, etc.) as an alternative to the costly use of infrastructure to produce drinking water.

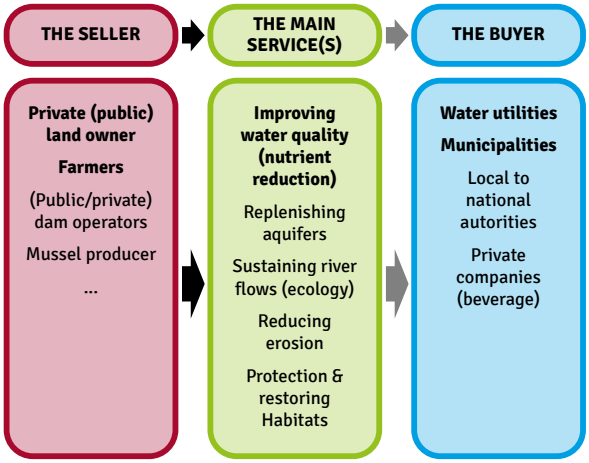


Fig. 3. Transactions within PES schemes in Europe. (Strosser)

3 PES design and implementation: environmental effects, economic efficiency and principles of justice

Two modalities for PES

Karsenty recalled that a distinction is usually made between two complementary categories of PES that are related to:

- the restriction of user rights at the household or community level, in other words the suspension (but not the transfer) of rights against payment or benefits for the purpose of ecosystem conservation;

- the investment (assets building), with priority for households, (as long as they own and/or manage lands) and the payment for time spent on environmental support actions (plantations, ecosystem restoration, changes in agro-sylvo-pastoral practices) for the purpose of developing viable alternatives for the future.

These two categories are often combined. The user rights suspension contracts (that Karsenty sees as conservation easement contracts with compensatory payments) are often accompanied by incentives for reforestation or ecosystem restoration, but without the automatic inclusion of the systemic changes needed for a permanent agro-sylvo-pastoral transition.

These two PES methods need to be combined with the multidimensional goals of the instrument. Ecosystem restoration and the fight against ecosystem degradation are usually the primary goal, but PES can also be used to fight poverty and even as a form of social redistribution. Discussion often focused on the legitimacy and effectiveness of assigning a variety of goals to a single instrument, goals seen in both PES design and implementation stages.

Amounts paid and the beneficiaries

It is important to have a clear definition of the areas that impact the supply of ecosystem services and those where beneficiaries of such services can be found. The beneficiaries of public goods (biodiversity, carbon, etc.) are numerous and often are difficult to identify fully. They sometimes even include future generations. In this situation, intermediation (the State, international institutions, NGOs, etc.) and public funding (Karsenty) are required.

With regard to the amounts of the payments, several participants specified that:

- the minimum payment must be equal to the opportunity cost for the conservation or the implementation of sustainable practices;

- the theoretical maximum payment must be equal to the total costs incurred by the destruction of the ecosystems, in other words the potential benefits for the society as represented by the ecosystem services linked to the ecosystem.

The amount of the payments, somewhere between these two variables, largely determines the level of participation of the targeted population. The “pay enough or don’t pay at all” principle mentioned by Engel refers to the minimum payments required to ensure the actors’ involvement. Payments that are too low can be counter-productive. Torres Rojo added that non-monetary incentives, such as technical support for change or training for alternate revenue-generative activities, may improve the beneficiaries’

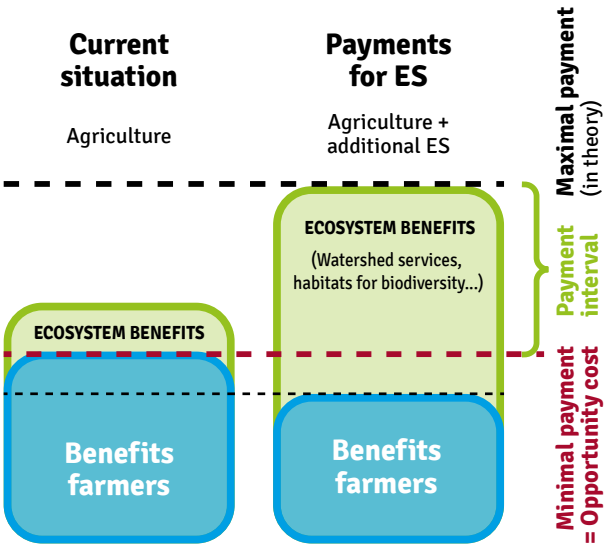


Fig. 4: Possible level of payments (Mortelmans, adapted from DEFRA and TEEB)

participation. Non-monetary incentives may also contribute to reducing the risk of "crowding out" the intrinsic motivations for conservation or to advancing the sustainability of the changes proposed through the projects.

Progressing from merely paying to accompanying change is especially important since reasons for participating in PES go well beyond financial considerations. In the case of Costa Rica, (example reported by T. Legrand), motivation was fed by three components of equal importance: funding, quality of life, social norms. More globally, the success of the programme must also be considered in terms of the construction of a national environmental image and collective ecological awareness, e.g. Costa Rica (Froger) and Ecuador (Landreau).

Conditionality

Engel distinguished between PES and more traditional approaches like ICDPs (Integrated Conservation and Development Projects). In her view, PES can be based on:

- Outcomes
- Activities (means like respecting a zoning map for example)
- Performance at the territory scale, e.g. in Germany where the average soil nitrogen concentration is measured in the targeted zone.

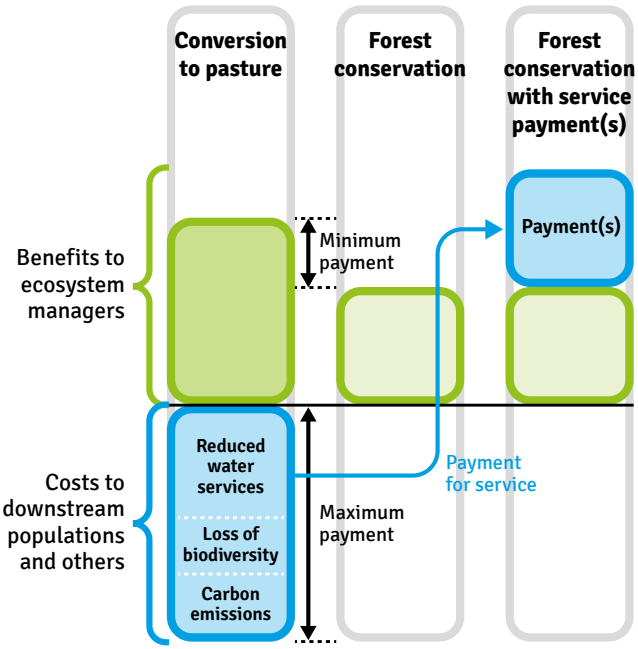


Fig.5. Conventional economic vision of PES (Engel, adapted from Pagiola and Platais, 2007)

Because of the aforementioned difficulty of establishing a precise link between a result and a practice (and the cost of the corresponding analyses), results are often assessed using proxies, which are less expensive to check. Engel explains that only part of the payments can be linked to the results (relative performance payments) especially in a situation where certain factors beyond the beneficiary's control could ultimately affect the attainment of environmental goals.

Additionality and the deadweight effect

Deadweight effects (payments that do not contribute to the environmental goal) by definition reduce the environmental additionality of PES as well as their economic effectiveness (achievement of the environmental goal at lowest cost). But they are difficult to avoid since the actor may tend to disguise reality to his/her own benefit by exaggerating the costs of participating in the programme, i.e. the opportunity costs, which are "hidden information" (Engel). This risk is not unique to PES. But it does bring up the question of the legal framework for the instrument: what qualifications must the beneficiaries of payments have? Should they be related to a geographical location? Or to a obligation to do or not to do in terms of land use? Furthermore, the introduction of a legal framework involves plans for concomitant control measures that must be feasible in both material and economic terms.

Deadweight effects are especially noticeable in the case of undifferentiated payments which pay a rent to actors whose participation costs are low, which lessen programme effectiveness. A programme like the one in Ecuador, which covers over a million hectares of forestland (86% tropical rainforests) is also characterised by low environmental additionality (Landreau) because, for political reasons, the forests are not necessarily located in areas where the deforestation risks are the highest. This type of programme ultimately seems to provide more support for deforestation than for avoided deforestation, especially since the per hectare compensation cannot compete with the value of alternative activities such as livestock production. Torres Rojo mentioned the Mexican case where the national PSA-H was not very effective in contributing to the deforestation reduction goal. But, he explained, the socio-political cost of designing a rainforest management plan to ensure legal felling would be too high. Hence it seemed politically simpler to design and implement PES.

Targeting PES beneficiaries

One way to limit deadweight effects and contribute to achieving PES goals at lowest cost is to invest in targeting the beneficiaries which entails environmental (effectiveness), economic (efficiency), and social (justice and equity) issues.

In practice, this most often means adjusting the amount of the payments and the list of programme beneficiaries to the opportunity cost of the potential participants, the ecosystem risks and/or the ecological benefits expected from the conservation of the threatened lands. Many programmes, however, prefer fixed per hectare payments although opportunity costs change, depending on the ecosystem or type of land. In Mexico, for instance, the PSA-H pays 280 Mexican pesos (16.5€) per hectare for natural grasslands and 1100 pesos (65€) per hectare for the rainforests (Torres Rojo). On the other hand, in Ecuador, where payments are not based on ecosystem protection, they are calculated on the basis of land size using a regressive per hectare payment scale that starts at 20 ha for individual contracts and 100 ha for community contracts (Landreau). In Ecuador, German development assistance (KfW) is providing support for work on defining the priority action zones on the basis of specific goals – reduction of greenhouse gas emissions and/or biodiversity protection – in an attempt to reach out to territories where PES beneficiaries contribute to fulfilling these two goals simultaneously.

The logic of compensation for opportunity costs combined with the search for efficiency (avoid deadweight effects) have limits. In areas suffering from heavy economic pressure (soybeans, palm oil regions) or from excessively high opportunity costs (Maris), PES would be less appealing. On the other hand, providing compensation for farmers with high opportunity costs stemming from land conservation activities brings up the problem of equity for the poorest farmers, and, the ease with which agribusiness could turn PES into a rent-generating instrument (Karsenty).

But targeting, as an activity, increases the cost of the programme significantly. Dutilly and Torres Rojo reported that in Mexico (Yucatán), the experts and the technical services are targeting the most accessible *ejidos* (communities). This reduces the transaction costs but is unfair to the *ejidos* that are farther away or are less accustomed to the system although they have more forestland. Economists have this in mind when they try to calculate the best cost-benefit ratio for targeting activities. Engel felt that the ratio would be positive in Costa Rica and in the United Kingdom but warned that the results could be different in the Failing States or when there are not enough data.

Hence, PES described in the literature corresponds essentially to an ideal standard, with alleged benefits especially in terms of economic efficiency and environmental effectiveness. But reality on the ground is different (the programmes' environmental additionality is not always verified) and certain dimensions, especially the ones relating to social, equity and legal issues are of the greatest importance.

The logic of compensation for opportunity costs combined with the search for efficiency have limits.

The other challenges of targeting: equity, legal concerns and social segmentation

Can and/or should the targeting of PES beneficiaries be fair? Targeting activities should at least take account of certain collateral, potentially counter-productive effects such as crowding out. A feeling of unfairness can lessen the effectiveness of payments if it encourages people who are not paid for their environmentally responsible behaviour to become des-incentivised and hence behave less virtuously. This phenomenon could develop into environmental blackmail. Forestland owners who are not granted payments (because there seems to be little chance that they will deforest their lands) might threaten to convert their forests if they cannot benefit from the programme, a situation that seemed looming in Costa Rica (Karsenty).

Pascual explained that the relationship between equity and economic efficiency is usually rather tense, although these two dimensions are interdependent. The problem of equity is excluded from the

standard economic position, where the main focus is on PES' economic efficiency. Thus equity issues tend to be externalised ("one objective per instrument"). Furthermore, this position supports the "do no harm" principle, which is typical of the safeguards put forth by international organisations. But equity is a dimension that should not be neglected. Unless considered at the heart of PES design and implementation, social impacts can generate potentially negative effects on long-term conservation (marginalisation, difficulties to access the resources, benefits taken over by the elite, insecure land ownership, etc.) and on the programme's operating costs (non-respect for the conservation rules, sabotage, contract cancellation, etc.). In sum, respect for local perceptions of justice when allocating payments increases the credibility and the effectiveness of the programme, especially when principles of justice are perceived as important as payments for participants of the programme.

Furthermore, taking account of both the cost effectiveness and the equity criteria together seems to be standard in the public PES, i.e. the vast majority of them. Pascual felt that thought must be given to equity and to the various ways it is accommodated through the implementation of the instrument, from the beginning, thereby refuting the "one instrument one goal" idea supported by many economists.

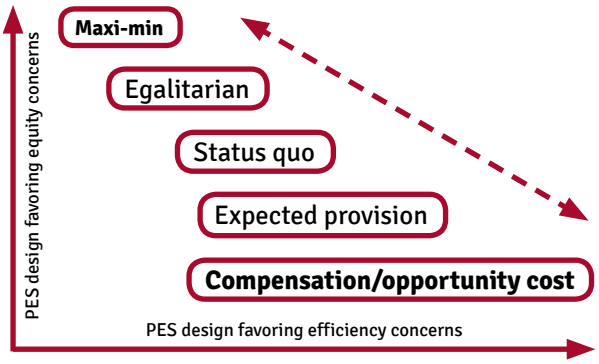


Fig.6. Tension between efficiency and equity principles (Pascual)

With regard to targeting, opportunity costs, ecological benefits and three other dimensions were discussed, namely, social targeting, territorial targeting and temporal targeting (Engel, Karsenty). Is it important to go beyond the opportunity cost logic to target impoverished populations and thereby establish rich/poor social segmentation? Referring to the Costa Rica example, Barton thought it would be wise to limit the right to the programme to residents who live on the lands concerned, in a context where financial institutions that own the lands are entitled to PES. Should payments contribute to ensuring respect for a pre-existing environmental law? Might a system of territorial zoning be introduced, with zones where regulations must be respected and zones where regulations are suspended and replaced by incentives such as PES?

Less attention was given to temporal targeting (and to programme sustainability) although it is especially important with regards to the temporality of the expected environmental benefits (Engel). This brings up the question of the terms and conditions for renewing contracts, since contracts are central to decisions on spatial organisation and changes in land use. In Mexico (PSA-H, Yucatán), the *ejidos* (communities) decide whether or not to renew contracts. The targeting component of the Mexican programme has changed over time as concerns the number of criteria and the relative importance of each criteria (risk of deforestation, marginality, presence of other forestry or environmental programmes, etc.). The profile of the *ejidos* selected for the programme changes from year to year and depends on the State (Dutilly). Are changes in the choice of eligible zones from year to year seen as an advantage, a way to better target the risk zones, or on the contrary, as a drawback as concerns sustainability and the expected environmental effects?

Looking at the time question, Karsenty suggested the possibility of combining a two-pronged time frame with a social target:

- in the short term: PES would be reserved for the poorest people in areas where a stringent implementation of the regulation would jeopardize their economic survival. Here, PES would combine financial compensation and investments in new practices and economic circuits;
- in the medium to long term: if the investment generates decisive results, the local population would be able to adapt to regulations that prohibit certain activities, and at that stage PES incentives would be replaced by regulations that are binding on everyone.

Individual or collective payments and principles of justice

Payments can be made to individuals (households) or to groups (community groups). The decision requires the study of changes to the household revenue, in the former case, and in the spatial organisation of land use at the collective level (like the *ejidos* in Mexico), in the latter case (Dutilly).

Engel felt that collective payments could contribute to strengthening the spatial coordination of action in places where communal land rights exist since environmental outcomes can often only be observed at the group level (beneficiaries). But collective payments are difficult to organise and bring up the question of rules of allocation within the group and whether they are fair, with respect to the difficulties of collective action (free-riders, etc.). The size of the group, its heterogeneity, options for monitoring members and their departure from the group are decisive to the effectiveness of the programme. Should all members of the community be paid to encourage some of them to change their ways? The question of social acceptability comes up at the level of each *ejido* (G. Le Velly). In Mexico (Yucatán), the allocation within the *ejidos* favours mechanised and traditional farming over livestock production although agriculture indubitably contributes to deforestation.

A legal system seeking to re-establish a certain level of justice is expected, *inter alia,* to introduce differential measures for different people, actually corrective measures that require careful thought and appropriate judicial organisation, in particular special attention to the conditions of access to PES linked to property rights over land and resources.

But beyond the question of legitimacy of the persons who may receive payments lies the problem of the action to be carried out when social and cultural groups do not have land property rights, e.g. land less peasants (Maris). In this vein, some discussants explained that payments to the State via the REDD+ mechanism would crowd out opportunities for communities to maintain their customary rights by pushing for "renationalisation" of forest resources. Other participants stressed, on the contrary, that PES for communities could strengthen their capacity to defend their land rights before governments or commercial actors (Engel) or even clarify the formal nature of these rights that hitherto had not been defined. In Ecuador for instance, a special team has been tasked to clarify the legal aspects of the land tenure issue (Landreau). In Costa Rica in 2002, since land was not registered, a system of land titling for small land owners was introduced (Torres Rojo). In Africa, the management and exclusion right, not the "complete" land ownership right (with an alienation right) constitutes the lowest level requirement. Thus prior to any PES action, rights are usually registered, and the corresponding maps are provided thus formalising collective land rights and the land rights of the lineages (Karsenty).

The risks associated with REDD+ are discussed by Karsenty who does not believe in "recentralisation" and thinks that the economic structure of REDD+ projects is based on a "virtual" logic derived from the construction of deforestation scenarios that generate positive "results" in nearly all cases (reduction of emissions not in real terms but in relation to the scenario). The REDD+ project promoters prefer this virtual economy rather than having to challenge the communities about their forest user rights.

Local governance

The social acceptability of conservation activities connected to the programme depends largely on the importance of the collective organisation of governance (Pascual). With regard to the best ecological and social outcomes, certain factors that contributed to the success of PES concept were mentioned:

- participatory approaches and the deliberative conflict reduction strategies (Pascual);
- the possibility to agree on compromises concerning the full conditionality for payments (Engel);
- negotiations for the purpose of defining what to act upon (Antona).

But what is the meaning of a good participatory logic in highly variable political and cultural contexts? What can be done to communicate with and obtain the voluntary participation of land managers (Mortelmans)?

There are several risks, and they much be taken into account. Maris stressed the risk of "double suffering" for population groups that have already been forsaken by the NGOs. She also spoke of the social capital which is needed to access programmes but can also be a factor of exclusion. Guevara added that special knowledge is needed to prepare for the participation of the poorest people, including the people who have little authority and to make

allowances for geographic isolation. Designing PES is complicated. If it is not correctly done, the lack of support for community capacities or the community's decision to choose another option can make the programme fail (Engel).

Landreau added an essential ingredient: trust. He mentioned a case where the local communities rejected a PES fearing that it might pave the way for the government to move onto the lands for some hidden economic purpose such as exploration by oil companies.

Pascual suggested studying the following two questions:

- What can be done to improve the participation of the stakeholders in the decision-making process and in recognising the various values and identities attached to ecosystems?

- What can be done to adopt an adaptive approach in PES governance, with flexible contracts that can be renegotiated periodically and with stress on the participation of underprivileged groups? A word of caution: greater flexibility may be of limited value since laws are designed to provide legal security for all stakeholders. to provide legal security for all the stakeholders. Legal security requires a certain stability which, however, should not prevent the law from executing well-grounded change.

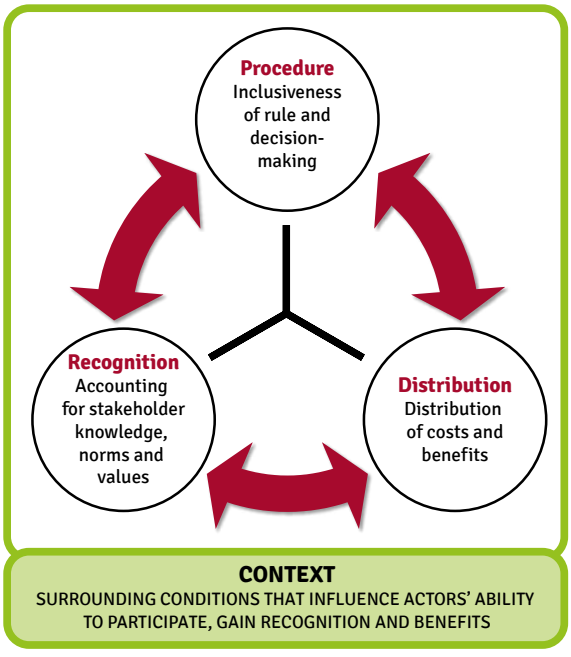


Fig.7. Factors that determine participation (Pascual)

The risk of "rebound effect"

The "investment" part of PES generates fresh funding. The "conservation" part, especially if it is not completely additional (payments not needed for conservation work, generally when they are higher than the opportunity cost for such conservation activities) also generates additional income and can be used to reinvest work time that was previously used for destructive activities. What can be done to prevent the newly available time and money from being reinvested in activities that are detrimental to the natural environment, e.g. acquisition of more cattle, or the development of rent crops that can have a direct impact on ecosystems thereby nullifying the initial ecological benefits?

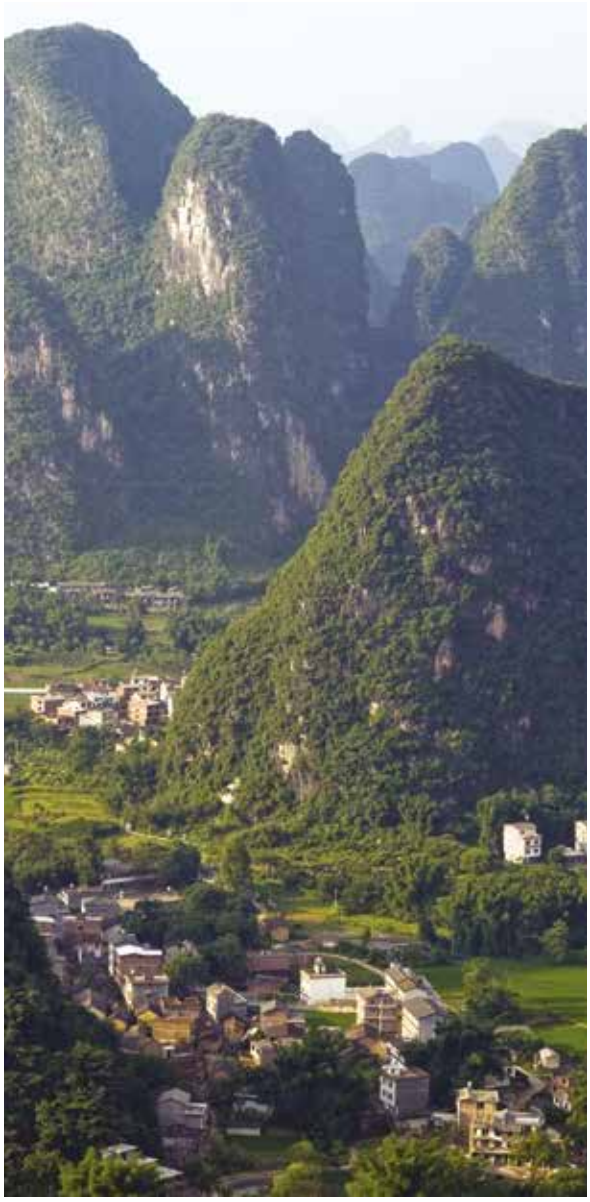
The participants, on the whole, felt that this revenue should be invested in sustainable practices such as agro-sylvo-pastoralism. However, the question is still open to discussion. Torres Rojo wondered whether investments should be used for activities that are connected to the forests or for some other purpose. How would objectives such as these be fulfilled?

Dutilly felt that questions should be asked about the capacity of PES to effectively preserve the forest ecosystems rather than to simply adapt to the dynamics of present-day deforestation by regularly reducing the amount of land targeted for protection or by changing PES zones, as it is observed today in Mexico. Studies conducted as part of the Pesmix project show that contracts can be renewed for the zone originally covered or can be applied to other areas; the actors readily adapt their contracts to the dynamics of change in the existing landscapes. Referring again to Mexico, Dutilly explained that the money from the programme is invested in livestock production, which means overextending the grazing lands, or in more sedentary agricultural development (presently the case) *inter alia* to buy inputs. The programme seems to fit in with a tendency towards spatial concentration and specialisation, with the spatial specialisation appearing more clearly in the agricultural areas (which formerly were part of the forestlands).

To limit the "rebound effect", payments might be made as part of a "complementary currency" system using purchasing vouchers that orient the buyers on their choice of goods, e.g. the vouchers cannot be used to buy chain saw for instance (Karsenty). But the risk is that a parallel market may quickly develop with the purchasing vouchers being sold for money (Pascual).

4 PES in the policy mix for territories

Barton defined PES as a combination of rules-in-use that directly determine landowners' decisions on their land use and as rules whose interactions with other instruments (fiscal, regulatory, economic) create new contexts which indirectly shape land use decisions. These rules-in-(inter)action led Barton to consider PES as an instrument that interacts with other instruments, not as an isolated instrument.



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This outlook fits in with the two-sided questions put forth in the Pesmix project: what do PES contribute to the landscape of environmental policies that is new, and how do PES fit in with, or oppose other instruments oriented to development and/or conservation (Dutilly)? When PES are incorporated in a series of policies, it triggers change in the attitude towards other current policies, changes that can contribute to fulfilling PES objectives (Torres Rojo). To meet specific needs and provide the best possible allocation of the rare funding, it is important to combine various political instruments (Torres Rojo). In Madagascar for instance, PES are more recent than ICPDs and the introduction of legal measures that allow communities to manage some of the renewable resources (the 1996 'Gelose' law on management transfer) has led to institutional overlapping and hybridization of devices (Froger).

Can PES, in connection with the authorised (in this case, forestry) administration provide support for the implementation of a public service mission within the framework of a national forestry law? In Madagascar, for instance, management transfers have involved the local communities (for supply and cultural services) and NGOs (for control) for the management of protected areas (Aubert). This line of thinking can be transposed, in part, to Europe.

A question of scale

Is the community or is a larger territory the most appropriate spatial scale for integrated territorial management (Dutilly)? According to Couvet, only actions on large lands can have an effect on biodiversity. The Mexican PSA-H is a good example of territorial dynamics. The programme started in 2003 with 127,000 hectares. By October 2012 it had grown to 4,041,000 hectares (Torres Rojo).

It is also possible to combine different scales of application for PES on a single territory to better meet the programmes' objectives. This might involve targeting vulnerable population groups, promote more equitable distribution, support collective actions or ensure respect for the existing legal orders, etc. Aubert emphasised the importance of considering that the local communities in Madagascar are not always representative. The territorial approach is relevant, but there is no reference zone, no planning unit that would

automatically be applied to each PES, which means that each country and each territory has to adapt PES to the local context (Ramananarivo).

Last, in Africa, where the equity issue is especially important, the question of replicating the South American PES is still pending (Legrand). The response is not the same in all the sub-regions, e.g. replicating the Ecuadoran PES in Peru. Furthermore, the success of the Ecuador government/German development assistance (KfW) experience may encourage certain donors, especially through ODA, Official Development Assistance (Landreau).

The various scales of application of the law (international, European and local law) are based on administrative boundaries and parties that do not necessarily meet the specific requirements to implement PES. More generally, PES must factor in the role of traditionnal and future actors, as well as the defined scope of action. As for the time scale, according to Torres Rojo, the present tendency is to plan PES for an extended period of time and thus contribute to building up the capacity for sustainable forest management. Knowledge of the functioning of ecosystems (and hence ecosystem services) and their adaptive capacities contributes to increasing this capacity. In Ecuador, for instance, with financial support from German bilateral development assistance, contracts between the State and the individual and communal landowners sometimes cover a period of up to 20 years (Landreau). From a legal point of view, Aubert felt however that in some cases priority should be given to short term contracts thereby stimulating dynamics that can lead to sustainable practices through new types of interaction among participating actors and also respecting the time periods stipulated in overlapping contracts.

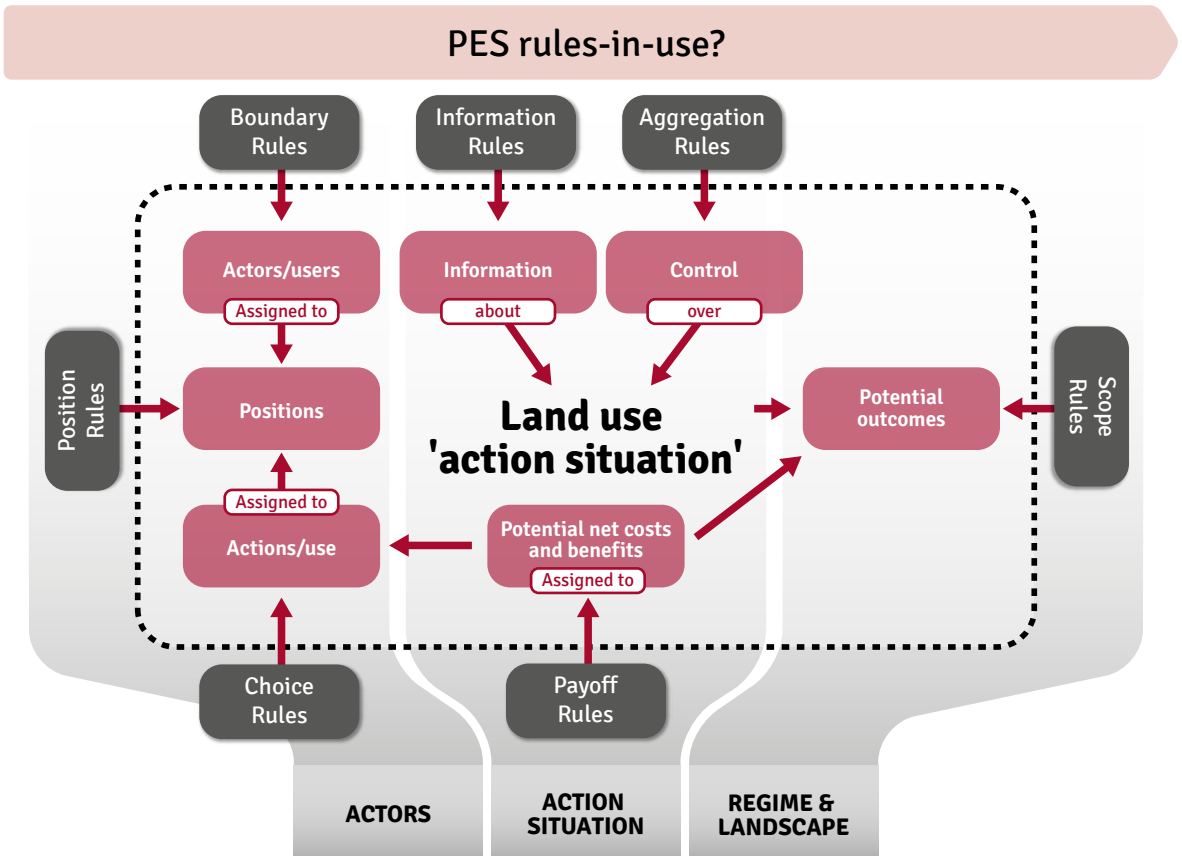

Fig. 8. The PES as a combination of "rules-in-action" (Barton)

5 Should guardians and "producers" of nature be paid?

In an "ideal" society, should the idea of compensating costs be replaced in the long run by minimal environment-related revenue for everyone providing environmental services, setting aside the question of additionality? (Karsenty). In other words, should compensation be awarded to "producers" of nature for their "good behaviour" in rendering collective services, using criteria that have not yet been defined (Maris)? What should be done about past efforts? Should the past efforts made by some countries to protect their forests (with reference to the REDD+ mechanism) be rewarded?

For some participants, such as Legrand, focusing solely on additionality meant adopting a short-term view. In the long term, he said, it would be less costly to support actors with a positive line of logic, including the indigenous peoples of Latin America, for instance, even in areas where deforestation is not a risk. Would it be possible to avoid the temptation of ecological blackmail by selecting actors who are anxious to make progress? Legrand also emphasised the limits to the *homo œconomicus* model in analysing motivations that embrace factors far greater than those in the model, such as the feeling of belonging to nature and to a community of people, or altruism, etc. He pointed to the transition from "well-being", mentioned by the economists during the discussion, to "happiness" and wondered whether happiness was the new paradigm of development, refering to the "Gross National Happiness" initiative put forth by Bhutan at the United Nations and supported by 60 countries.

The capacity of the homo œconomicus model to analyse motivations is limited.

The political dimension was also considered because compensation payments affect electoral stakes, and it may be difficult, at a later time, to stop the payments or even to change a programme that is already in progress. Allowances much be made for political and administrative obstacles although they are less pervasive in new programmes (Engel).

Can taxes pay for PES?

To develop large-scale PES requires major funding. Torres Rojo quite rightly wondered about the financial continuity of the programmes when referring to the Mexican case where the programme only effectively covers 30-35% of the total potentially area.

Taxes can be used to support PES. With the agreement of the international financial institutions, a pre-allocated national tax could be levied on activities that pollute or destroy the environment and then used to finance national PES programmes. But in fact, tax revenue is seldom used to support biodiversity conservation (Fétiveau), which means that different types of funding sources are needed.

Landreau mentioned the case of the Ecuadoran government that turned to German development assistance (KfW); negotiations with the Ministry of Environment has led to long-term funding for the programme's beneficiaries via a national environment fund (FAN). Alongside State funding (one-year budgets), a special fund has been set up and is fed by bilateral and multilateral international development aid (as well as NGOs and private enterprises) to finance long-term management plans up to 20 years.

On the question of combining funds, Mortelmans pointed to the potential contribution of private enterprises to projects in Flanders whose activities depended at least partly on certain ecosystem services (landscape beauty, etc.). He also spoke of potential fund transfers between agencies with complementary missions, e.g. erosion control and canal management/upkeep in Flanders.

To finance the national PES in Mexico, Torres Rojo said that the Mexican forest fund combines sources of funding that included water bills, the federal government, users of ecosystem services (various funds) and international funds.

Is it realistic to expect funding from private sources? Most stakeholders give priority to predicting the short-term environmental impacts and do not realise that their activities, especially their supply chain, depends on ecosystem services and biodiversity. They do not look at the long-time vision needed for biodiversity (Fétiveau). At the end of the day, to attract private financial resources the public authorities need to show an example and create leverage.

Karsenty and other participants suggested the following. Why not direct national REDD+ policies towards national PES policies thereby avoiding problems connected to the "REDD+ projects", especially the very high costs of "carbon bureaucracy" connected to measuring stocks and flows and carbon credit certification? The savings on REDD+ projects expertise would provide money available for investment. Or else, political courage should be used to transform harmful subsidies into positive incentives, thereby strengthening the coherency of public policies. The impacts of these ideas are difficult to evaluate (long-term process) but their potential is great.

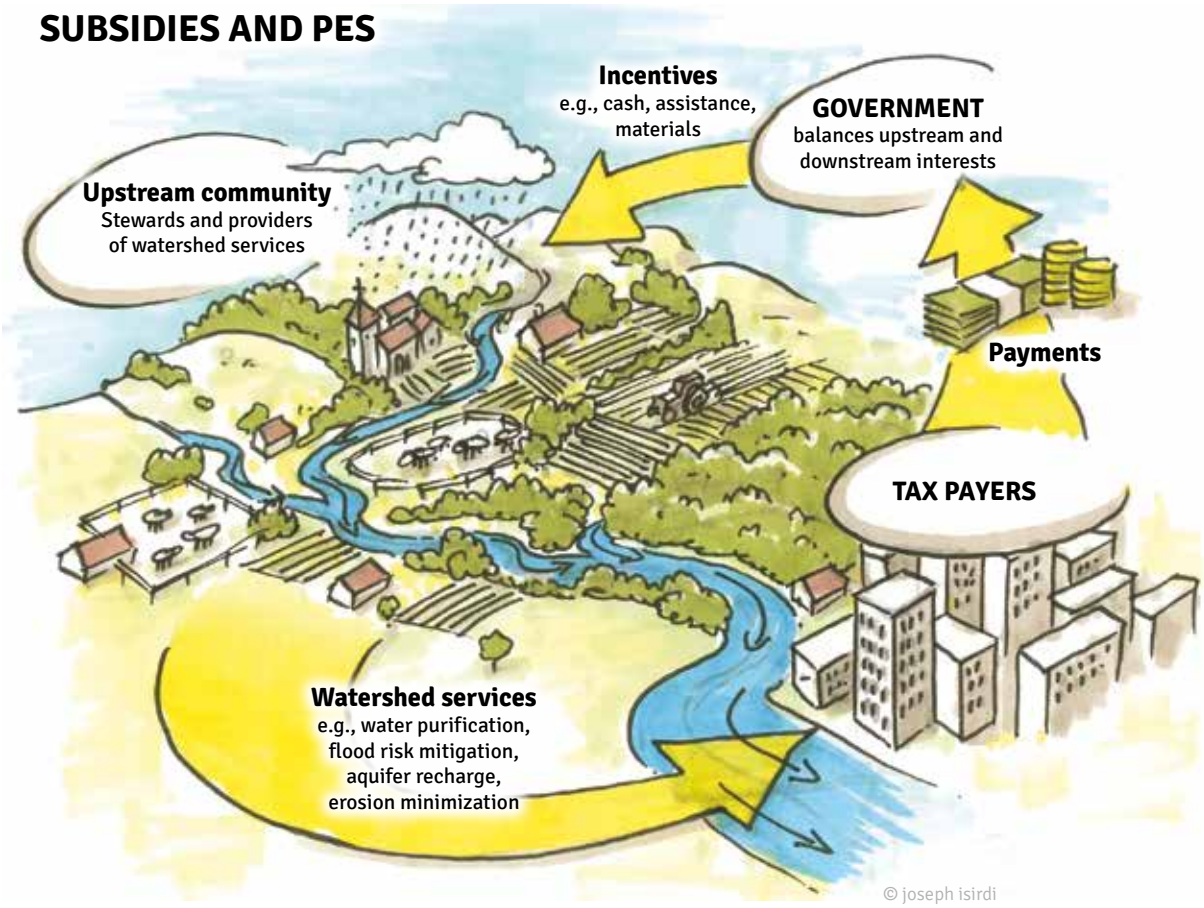

Fig. 9. Funding by the direct beneficiaries (Mortelmans, adapted from DEFRA)

6 PES and the law

Does PES require special legislation? According to Aubert, an overabundance of legal provisons could make the law inapplicable, as is the case in Madagascar.

At the worldwide level, what are the legal provisions that govern North-South relations concerning the management of global public goods? With globalised thinking dominated by western law, could PES impose a single model of legal relationship? Applying such a model would be complicated since it would clash with customary law and traditional ancestral practices. Similarly, should lighter forms of property law be adopted or would this reflect a western ethnocentric view of the law? What are the collateral effects of applying a standard PES model rather than using the pluralistic approach recommended in the anthropology of development (Langlais)? A first solution to that dilemma would be developing a contract-based legislation with due respect for pre-existing laws (Aubert).

The contract as a major legislative tool for PES

Contracts are a central component in the issue at hand. However, according to Langlais, a contract, in the economic sens of the term, remains theoritical. The law, in this case expressed through a contract, is much more than an adjunct serving the economy. Nonetheless, the contract-based approach could contribute to the emergence of a new type of governance that would benefit the private actors. In this scenario what would be the role of the State?

First of all, a contract has to be explicit and express the consent of the contracting parties to conditions that have been negotiated. The conditions can be renegotiated when the contract is renewed (Aubert). Certain conditions are essential, e.g. an institutional framework that facilitates short financial circuits and guarantees the stability of private law contracts. A contract has to be secured by the commitment of a legal entity and not through linage. With this in mind, PES may be useful in restoring resource rights that have been revived as a result of social dynamics (Aubert). But it can also be problematic, especially because of the lawyers' staunch demand that a legal entity be party to the contracts.

Besides the rules on drawing up and applying the contract, that create certain difficulties, the very idea of a contract suggests the existence of an exchange of desiderata between the beneficiaries and the service "providers". Yet the roles of the debtor and creditor are not cast in marble. Furthermore, when drawing up a contract, the beneficiaries need to know the purpose of the contract and thus know why it is in their interest to sign it. There is a potential risk that the beneficiaries refuse to pay when the service is no longer free of charge (A. Langlais). Once again, it all depends on the definition of the "services".

Last, Labat stipulated that certain elements in the existing legislation on contracts hindered the development of PES (in France):

- the duration of contracts does not correspond to the long time-spans of biodiversity;
- Contracts with farmers are still fragile because it may be requalified by the judicial authorities;
- requests related to biodiversity on owned lands are infrequent and complicated to implement from the notary's point of view.

Considering the above, what ideas for the future should be introduced into French law on the conservation and restoration of ecosystem services? Labat suggested three legal actions: environmental land trusts, "transpropriation", and the introduction of environmental easements (partly inspired by foreign legal systems).

Conclusion

Karsenty stressed the importance of this interdisciplinary meeting as an opportunity for economists, lawyers, ecologists, philosophers and many others to discuss a subject of research they share, an instrument that is used both in the developing countries and industrial countries. One question that came up repeatedly concerned the limits to the mechanism being discussed, which led to the question of the need for common conventions. The uncertainty of the scope with regards to PES led to the question of innovation: is this an unprecedented instrument or are we giving new conceptual meaning to an existing line of logic or policy known under some other name? This question has legal implications. Is a new legal regime needed for PES or do the existing instruments suffice to give it legal status?

As usual, the questions outnumbered the answers, although there were real marks of progress. First of all, the deconstruction of the idea that PES are market-based instruments although there is still some disagreement on the – complex – relations between PES and markets, especially when the REDD+ mechanism is included. The distinction between ecosystem services and environmental services, which was outlined by a number of authors, was brought out during the discussion and was useful is clarifying several points, especially in relation to contracts, "results-based payments", and the risk of commodification.

Furthermore, the economists' traditional vision of "one objective per instrument", which distinguishes effectiveness and equity, was taken apart in several interventions by economists. Equity is decisive in collective action and hence to environmental effectiveness, especially in the South. Likewise, the logic behind "compensation for opportunity costs" creates huge problems of equity and legitimacy for the poorest stakeholders and for the ones (and they are often the same) whose practices do not threaten ecosystems. Thereupon, the debate on "compensate or reward?" went beyond the question of effectiveness to examine the global position or the most appropriate status to give to the "guardians" and the "producers" of nature.

Last, the discussion gave due pride of place to the central problem of property rights. PES are intended for people who have rights, especially land tenure rights, be they individual or communal. This point was implicit in Coase's proposals in 1960 when he emphasised the importance of recognising clear, complete property rights as a prerequisite to negotiations that are supposed to produce an optimal solution – providing there is no transaction costs. The world of today, however, is very different from the 1960s, Coase's time, and the ecological crisis is obliging us to revise our way of defining the role of instruments. PES can be used as pivotal elements in the hierarchical recomposition of territorial policies by incorporating the various – ecological, economic and social – objectives of public action. In sum, the political mix would be absorbed and coordinated within an investment-oriented PES instrument with a variety of goals. This may be the prerequisite that allows PES to become a veritable instrument of an ecological transition in rural territories.

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