

Exploring the economic discourse on market-based instruments for ecosystem services

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1. Introduction

Since the mid-1990s, the concept of ecosystem and environmental services has become increasingly popular, be it in academic or operational circles. Ecosystem services correspond to the benefits derived by mankind from biological processes enabling the functioning and maintenance of ecosystems (CGDD, 2010). The services provided by ecosystems are able to sustain or protect human production or consumption activities, or affect welfare in general (Dictionary of Environmental Economics, 2001). They are classed in four categories (MA, 2005): *provisioning services* for resources essential to agriculture and industry (food: crops, livestock, fisheries, aquaculture, etc.; fibres: timber and firewood, cotton, silk; genetic resources; plant molecules for pharmaceuticals, cosmetics, green chemistry and biofuels, etc.), *regulating services* (air quality, local and regional climate, quantity and quality of water, erosion, waste disposal, natural risks, etc.), *supporting services* (soil formation, nutritional cycle development, etc.), and *cultural services* (aesthetic services provided by landscapes and animals, recreational and tourism services provided by natural sites, services of a spiritual or religious type, such as sacred forests). All these services include material and non-material benefits derived from ecosystems in their natural state or modified by human practices (Karsenty et al., 2009).

The terms “environmental services” and “ecosystem services” are sometimes used interchangeably. However, FAO (2007) proposes to make a distinction between environmental services, considered as a subset, and ecosystem services which correspond to externalities⁷. Environmental services thus possess characteristics that make them more like public goods, which excludes provisioning services, which can be assimilated to private goods traded on markets.

Jeanneaux et al. (due out) showed that the number of articles on ecosystem and environmental services in the international databases Web of Science and Scopus has increased nine-fold in ten years. Apart from scientific literature, a whole range of books and reports arising from institutional initiatives has been widely distributed and mediatized, such as the Millennium Ecosystem Assessment (2001-

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⁷ That is to say unintentional effects that the activities of a person or company have on others. Externalities can be either harmful or beneficial to others – i.e. negative or positive. And above all, they are “external” to the market in the sense that they are not subject to trading and therefore have no market value.

2005) (MA, 2005), The Economics of Ecosystems and Biodiversity (TEEB, 2010), the FAO report (2007) or the report by the French Strategic Analysis Centre (Chevassus-au-louis et al., 2009). Lastly, very many networks have been launched since the 2000s to simplify the promotion and operationalization of these concepts through biodiversity conservation policies and projects⁸.

Economics played a major role in the birth of the ecosystem services concept and contributed to its dissemination and politicization (Méral, 2012). Yet, this concept does not seem to be totally stabilized and is subject to controversies, notably in the ecology field (Teyssède, 2010). Several operational stakeholders met during the Serena research programme⁹ emphasized that understanding of the ecosystem services concept and its insertion in public policies needed to be clarified¹⁰. The risk of seeing a transdisciplinary concept (along the lines of the ecological function concept) compromised, and especially of it being made into a vector for the promotion of market-based regulation instruments or for the requalification of public policy provisions as market-based instruments (MBIs), is often highlighted (Sullivan, 2009).

The purpose of this paper is to analyse the market-based instruments applied to ecosystem services, along with their potentials and risks as regards sustainability requirements. It seems necessary beforehand to take another look at the different interpretations of the ecosystem services concept within the economics field, in order to more effectively analyse its politicization through the promotion of market-based instruments generally assimilated to payments for environmental services systems (Pagiola et al., 2004; Wunder 2005). The merits and limitations of such assimilation are discussed taking the case of environmental certification systems.

2. The Economics view of ecosystem services

Publication of the final *Millennium Ecosystem Assessment* report in 2005, was a key stage in the birth of the ES concept, but it was more a case of its politicization (in the same way as the Brundtland report for sustainable development) than its emergence as an actual scientific concept (Méral, 2012). If we are to understand the reasons for its mediatization since the turn of the century, it is important to consider the origin of its appearance in the academic

⁸ In addition to the networks feeding the economics–environment interface debate (*Ecosystem Valuation, Earth Economics, Earthtrends, etc.*) or those that are more media-oriented (*Guardian Environment Network, Business Green.com, Ecoworldly, etc.*), it is worth mentioning those directly geared towards conservation funding: *Conservation Finance Alliance, Katoomba group, Ecosystem Marketplace, Avoided Deforestation Partners, BBOP Learning Network, Nature Valuation and Financing Network, etc.*, which were virtually all created in the mid-2000s. Their aim is to strengthen, promote and increase knowledge and skills on conservation funding issues and payments for ecosystem services. They also seek to persuade multinationals to invest in conservation (Méral, 2012).

⁹ ANR Serena programme (Environmental services and use of rural areas). <http://www.serena-anr.org/>

¹⁰ In particular, the operationalization of the concept means specifying the links between ecosystems, ecological functions, and regulating and supporting services, which is necessary for knowing the conservation status of an ecosystem and thereby the services it will be able to provide in the future.

and economic sciences field. Another key stage was the appearance of the book by Daily and the article by Costanza et al. in 1997.

In fact, from the end of the 1990s, the monetary valuation of services provided by ecosystems reconfigured the relations existing between environmental economics and ecological economics¹¹. Indeed, many economists claiming to be from the latter school of thought consider today that monetary valuation is a road to be taken to influence political decision-making. For Spash (2009), these new “environmental pragmatists” choose monetary valuation to speak “*the language of the market place, accountants, financiers and bankers*” (p.256). This stance, launched with the biodiversity programme of the Beijer Institute at the beginning of the 1990s and publication of the article by Costanza et al. (1997) on the values of global natural capital and ES, was strongly backed and supported by conservation ecologists and biologists. The latter, who were greatly involved in the *Millennium Ecosystem Assessment* found in monetary valuation a way of alerting decision-makers to the economic stakes of conservation. The ES concept serves to illustrate how the erosion of biodiversity affects the ecosystem functions underlying services critical for human welfare.

The objective sought by this “new economy of nature” to use the title employed by Daily and Ellison (2002), via the monetary valuation of ES, is to identify the costs generated by the absence or non-application of public policies intended to reduce pressure on ecosystems. The TEEB approach fits explicitly into this way of thinking, as highlighted by De Groot (2009, p. 5): “*One of the aims of the TEEB study is to provide more and better data and understanding of the significance of these losses and the consequences of policy inaction on halting biodiversity loss at different scales (global, regional and local)*”¹².

Likewise, the 2010 report by the Secretariat of the Convention on Biological Diversity entitled *Global Biodiversity Outlook* particularly emphasized the monetary value of ES. The merits of monetary valuation for integrating potential effects in terms of how projects and programmes impact on biodiversity are also being increasingly acknowledged. For instance, the report by the French Strategic Analysis Centre published in April 2009 formed part of this perspective, by highlighting the usefulness of monetary valuation in public decision-making processes, particularly for an *ex-ante* assessment of policies and projects (Chevassus-au-Louis et al., 2009).

The different economic assessment exercises undertaken on national and international scales thus fit into a perspective of enhancing awareness: it is a matter of putting a figure on the value of ecosystem services to show their economic importance and the costs generated by their deterioration or destruction. Initially, they were more in response to a pragmatic objective of

¹¹ Theoretical divergences within environmental and natural resource economics led to a split. Some authors, influenced by systemic ecology and by heterodoxical economics focusing on human-nature interactions, began to lay the foundations of contemporary ecological economics (Røpke, 2004). Ecological economics is quite an unorthodox school of thought that looks at conditions for coevolution between ecosystems and economic systems. As noted by Froger (2008), while some are interested in the biophysical dimensions of economic activity and study the ecological limitations of human activity (via bioeconomic models) (Costanza et al., 1992), others place emphasis on institutional issues associated with the regulation of natural resources (Costanza et al., 2001), along with the redistributive challenges of environmental issues (Martinez-Alier, 2002). Ecological economists recommend using not only monetary valuations but also qualitative evaluations, integrated within multi-criteria analyses (Froger, 2005).

¹² See also the European study entitled “The Cost of Policy Inaction” (Braat and ten Brink, 2008).

mobilization, rather than being an end in themselves (Daily et al., 2009). This economic approach predominates, even though their impact in decision-making terms remains weak, notably due to their static nature, the fact that they do not take into account threshold effects and an absence of monitoring, as shown by Fisher et al. (2008) based on an analysis involving 34 case studies of ES valuation¹³. By adopting such a stance rather than taking a holistic approach, from which the ecosystem concept was derived, economic analysis favours an anthropocentric vision with, on the one hand, the monetary valuation of ES (total economic value) and, on the other hand, the promotion of new market-based instruments designed to encourage the maintenance or production of an optimum level of ES. This dominant vision explains the tendency to favour an approach to ES from an externalities viewpoint rather than a broader vision of all the services provided by ecosystems.

In the economics of externalities, ES are conceived by way of the externality concept, which defines them with the help of two conditions (Baumol and Oates, 1988 p. 17):

- A condition (1) of existence (what the externality is): *"an externality is present whenever some individual's (say A's) utility or production relationships include real (non-monetary) variables, whose values are chosen by others (persons, corporations, governments) without particular attention to the effects on A's welfare. (...) It should be noted also that this definition excludes cases for which an individual deliberately acts to affect the welfare of A"*.
- A condition (2) relative to the ineffectiveness of payment *"The decision-maker whose activity affects others' utility levels or enters in their production functions, does not receive (pay) in compensation for this activity an amount equal in value to the resulting (marginal) benefits or costs to others"*.

If environmental services are considered to be externalities, their internalization, making it possible to fix them at an optimum level, assumes "payment" between the beneficiaries and the providers/producers of the services in question. The arrangements for such a transaction are variable and may take the form of a tax or subsidies, and may also involve a contract between the State and private operators, or even a direct contract between service producers and beneficiaries. The market-based instruments designed to promote positive externalities and reduce negative externalities are developed below.

By taking a service economy¹⁴ or package economy approach (Moati, 2008), another, more relevant qualification of ES can be proposed for analysing other types of market-based instruments – those involved in environmental labelling, and they are examined in the final section of this paper. ES can thus be qualified

¹³ In fact, the monetary valuation of ES gives rise to debates on the technical, ethical and pragmatic dimensions of the calculation methods (Méral, 2012). How can ecosystems, which are dynamic and stochastic by nature, be assessed? Are not the anthropocentric and utilitarian undercurrents of the monetary valuation of ES questionable? Do they not entail the risk that measurement of the functional values of ecosystems in particular will be side-lined? How efficient are such measurements? Are they not likely to give the illusion of an ecological equivalence between natural assets that are subject to different threats, hence requiring varying degrees of protective efforts? See the special issue of *Ecological Economics* (1998), 25(1).

¹⁴ The service economy (du Tertre, 2010) is a fairly recent school of thought in economics. It involves selling "services" (sometimes called "solutions") to users/consumers, rather than goods or services separately.

in terms of functionality. In this perspective, a product, agricultural for example, is not just a mere tangible good, it may also guarantee the respect of different clauses, or the adoption of values relative to supply chains and production process (genetic resources, animal feed, veterinary products, seeds, phytosanitary products, etc.). In recent years, growth in the content of information available for agricultural products bears witness to such a structural change: there is “tertiarization” of agricultural products¹⁵: they incorporate new services, such as the preservation of health and of the environment (Nefussi and Aznar, 2007).

Insofar as the different dimensions of the contribution made by agriculture are conceived and integrated into the product to meet consumer demand, agricultural products become “agricultural solutions” combining goods and services. What is produced and sold is a package of complementary services and goods (Moati, 2008; Jeanneaux et al., 2011), such as cashew nut chocolate, a product of organic agriculture derived from fair-trade. Payment for the service(s) incorporated into the product is usually procured through the consumer’s agreement to pay more for that product and the associated services. Certification by an independent third party reduces the asymmetry of information between the producer and the consumer by providing the consumer with a guarantee that the means employed by the producer, which may involve practices designed to help maintain the provision of one or more specified ecosystem services and which the consumer is paying for, are actually being respected¹⁶. The voluntary nature of these environmental labelling systems should be noted.

However, ES issues in economics are usually very largely interpreted from the externality angle, without any major break from the tradition of environmental economics. How then are ES internalized through systems qualified as market-based instruments? The “payment for environmental services” concept, initially introduced to designate intervention mechanisms resembling a private voluntary transaction, is currently tending to be used to requalify other private systems – environmental labelling of agrifood products targeting ecosystem management methods for example, but also some pre-existing public regulation mechanisms, notably agri-environmental measures (Engel et al., 2008). What are the objectives and implications of such requalification? What are the potentials and risks of these systems with regard to sustainability requirements?

3. Payment for environmental services: what means for what ends?

As highlighted by FAO in its 2007 report, PES are justified by the existence of positive externalities (to be encouraged) or negative externalities (to be reduced) induced by production activities (agriculture or forestry) which play a decisive role in spatial management. This justification is widespread in the literature.

¹⁵ This tertiarization is also increasingly concerning the forestry sector.

¹⁶ It needs to be pointed out that while the definition of certification is legally supervised, hence precise, initiatives designed to obtain labels are restrictive to varying degrees – except in the case of agrifood products where the use of the term label is, at least in Europe, limited to official labels of origin and of quality which are subject to regulations.

In PES schemes, the beneficiaries or buyers of environmental services compensate or remunerate the service providers or producers¹⁷. PES were initially defined as being voluntary transactions conditional upon clearly defined environmental services between a provider and a beneficiary (Wunder, 2005)¹⁸. PES are taken to be a transfer of resources between actors that is of an incentive nature, intended to reconcile individual and/or collective land use decisions with the social worth of sustainably managing natural resources and conserving biodiversity. They should (ideally) include an “additionality” dimension (bringing environmental gain when compared to an absence of any project¹⁹) and a “conditionality” dimension (there should only be payment once the service has been effectively provided). In this original acceptance, PES stood out from other environmental policy systems in that they were based on direct negotiation of a Coasian type between contractors to produce a given level of service (Muradian et al., 2010) fitting a beneficiary-payer logic rather than a polluter-payer logic²⁰.

“PES” terminology is not neutral (Karsenty et al., 2009). It suggests an implicit distribution of the rights and duties of those involved: who has the right to services, who has the right to pollute or degrade the environment, whether or not those responsible for the degradation must pay, who has the right to be paid for not damaging the environment, etc. (Swallow et al., 2007). “Payment” is the most frequent and generic term, but it is associated with the idea of remuneration likely to create conflicts (Wunder and Vargas, 2005). The term “market” (“Markets for Ecosystem Services (MES)”, (cf. EU emission trading system in 2005) suggests the idea of institutionalized competition between actors, whereas in reality it usually involves a contract signed between stakeholders (beneficiaries or providers) defined right from the start of bilateral negotiations. Moreover, in developing countries, the term “market” is often assimilated to a risk of the privatization of services which had hitherto been freely or cheaply accessible to the largest number of people (Wunder and Vargas, 2005). Another term sometimes used in reference to PES is that of “reward”, which induces an idea of merit and justice (fair remuneration). As service producers are “rewarded” – even if providing those services does not cost them anything – it may lead to disputes when the expectations in return for that reward are not forthcoming (Swallow et al., 2007). Lastly, the term “compensation” is also used. It refers to the cost (direct or opportunity) that the service producer incurs to provide the service in question (change of location, practices, etc., or abandoning such changes). In such a perspective, only the service producer incurring the cost has the right to benefit from compensation (Swallow et al., 2007).

¹⁷ The literature often uses the term “provider”, which seems problematic for cases where the agent is paid for reducing pollution. The term “producer” seems more neutral and, moreover, refers to the fact that the economic operators remunerated by PES are virtually always producers in the economic sense (loggers and farmers in particular) (Laurans et al., 2011).

¹⁸ Following criticism, notably from Muradian et al. (2010), Wunder (2011) reformulated his definition: the transaction is “voluntary” to a certain degree for the buyer and entirely so for the producer; the environmental service may be specific or make up a “basket”; the service may be bought by the buyer (beneficiary) or by a public body; it is “provided” by a producer or a community; conditionality underlies the conception and functioning of the systems.

¹⁹ Demonstrating additionality means defining a “scenario without a PES project” and comparing it to a “scenario with a project” and deducing the “net effect” of the PES project forming the additional component.

²⁰ Although the “polluter pays” principle is sometimes applied to justify payment by the beneficiaries of services, as in Costa Rica with the fossil fuel tax, paid back into the PES system.

The term PES is also used to qualify systems of a very different nature. Laurans et al. (2011) thus distinguished between four types of PES. “Voluntary and bilateral” PES (private contracts and bilateral agreements with the example of Vittel, contracts for the provision of services with the example of conservancies in Namibia, environmental certification), “voluntary and collective” PES (corresponding to voluntary and conscious contributions by different consumers, not necessarily beneficiaries, to remunerate practices producing an ES, cf. donations to WCS used to protect birds’ nests in Cambodia), “compulsory and bilateral” PES (mechanisms that organize an exchange between two uniform groups of economic stakeholders, with compulsory payment, cf. taxes or user charges for water consumption imposed by public services and used to remunerate practices protecting the water source upstream), and “compulsory and collective” PES (based on compulsory contributions, levied without any direct link with the service, to remunerate practices, cf. “collective” obligations, taxes levied and public subsidies assigned to payments for “good practices”).

In fact, since the turn of the century, there has been a multiplication of PES contracts in Latin America (Corbera et al., 2007; Kosoy et al., 2007; Pagiola, 2008; Wunder and Alban, 2008; Rapidel et al., 2011), Africa (Sommerville et al., 2010; Wendland et al., 2010) and Asia (Bennett, 2008; Adhikari, 2009). They cover a very broad spectrum ranging from national programmes managed by governments²¹ to local projects of more limited scope and tending to be funded by the private sector or cooperation agencies. The different elements of Wunder’s definition of PES apply more or less depending on the number and type of ES involved (on the nature of the service approaching the characteristics of a public good – depending on the degree of rivalry and/or exclusivity of the beneficiaries), the payment mechanisms used (by the beneficiary or by tax), and the number of buyers (public or private, direct or intermediate beneficiaries) and vendors (producers) involved in the transaction (Landell-Mills and Porras, 2002; Wunder, 2005; Engel et al., 2008).

In industrialized countries, promotion of the ES theme is usually reflected in a requalification of pre-existing public intervention systems, particularly in agriculture. The “PES” found in the literature are thus usually existing instruments, whose purposes have been reformulated in terms of promoting ES. This is particularly the case with certain agri-environmental measures established in Europe and the United States (Baylis et al., 2008). It involves internalizing a positive production externality within agricultural policies, with those externalities being requalified by numerous authors as “environmental services” (e.g. Madelin, 1995; FAO, 2007) or as “environmental goods and services” (Mahé, 2001) without, moreover, making any distinction between goods and services. Work by the OECD on rural amenities (OCDE, 1994) and on the multifunctionality of agriculture (OCDE, 2001) also fits in with this perspective. ES can thus be used

²¹ Costa Rica is a pioneering country in implementing PES through a national PES programme (or PSA – *Pago por Servicios Ambientales*) launched in 1996 by forestry law 7575 with a view to halting deforestation (Daniels et al., 2010; Legrand et al., 2011). The national forestry finance fund (FONAFIFO), the trust fund in charge of PES programme management, buys from landowners (usually private individuals) services generated by certain land uses. For instance, several types of land use can qualify for payments: (1) reforestation through plantations (since the forestry law), (2) conservation of existing forests (since the forestry law), (3) natural regeneration of forests (since 2005), (4) agroforestry systems (since 2003), (5) sustainable logging (introduced by the forestry law, withdrawn in 2002 and reinstated in 2010). The PES programme requalifies the former systems implemented in Costa Rica to control deforestation (Le Coq et al., due out).

as a new element to justify agricultural subsidies and support measures for farmers that are sometimes challenged because of the distortions they are likely to generate for competition. Requalifying them as PES makes it possible to present them expressly as market-based instruments and not as protectionist tools. The argument in defence of environmental protection gives way to a more positive discourse on the promotion of ecosystem services and an incitement to produce them.

Alongside these public agri-environmental measures, there are some rare cases of PES linked to private voluntary contractualization. They arise from “private”, “self-organized” bilateral negotiations resembling the Coasian model (Coase, 1960). The example always cited in France is that of the contract concluded between farmers located in the catchment area of the Vittel spring and the Bottling Company for Vittel mineral waters. It is in fact the one that most resembles the PES promoted in developing countries and which is therefore most easily identified as such by international observers (Landell-Mills and Porras, 2002; Perrot-Maître, 2006; Engel et al., 2008).

The relevance and effectiveness of PES are the subjects of lively debates. According to Wunder (2005) and Laurans et al. (2011), they have great potential for halting the degradation of natural resources, attenuating the imperfections and limited successes of integrated conservation and development projects (ICDP) or sustainable management of resources, and mobilizing additional financial resources. They would also appear to have certain social potentials, especially in developing countries: diversification of incomes and activities, job creation, capacity building (Froger and Maizière, 2012). Some authors, such as Sembrès (2007), Karsenty et al. (2009), Muradian et al. (2010), Legrand et al. (2011), are more sceptical about their effectiveness (ability to meet contractual environmental objectives²²), their efficiency (ratio of achieved effectiveness to investment made), their equitable nature, their legitimacy and their longevity. They express reservations about the results expected from PES, highlighting the difficulties encountered in implementing this mechanism (scientific uncertainty, inadequate ecological knowledge, high transaction costs, inappropriate methodology for controlling the status of environmental services, etc.) or in identifying their perverse effects (hijacking and appropriation of the instrument by stakeholders who are not initially targeted, funding capture strategies, weakening of public authorities and the role of environmental policies, degradation of ecological systems, slow-down in the development of new more sustainable practices, commodification of biodiversity, worsening of inequalities, etc.).

What is probably most notable about PES, and for which there is consensus in the literature, is the diversity of the systems in which they take shape. It is impossible to make an overall judgment on the virtues or problems assignable to such a mechanism. Its effectiveness, its efficiency and its redistributive impacts can only be appraised for particular forms of instruments. This is what we propose to illustrate using the example of environmental labelling/certification²³. What are its main characteristics? Have the different types of labelling/certification and their purposes been redefined in favour of the

²² For example, the link between PES and changes in stakeholder behaviour is subject to debate: the lack of additionality in some PES is sometimes pointed out, notably for national PES like those in Costa-Rica (Wunder et al., 2008) or Mexico (Alix-Garcia et al., 2009).

²³ For a comparison of PES and environmental certification, see Le Coq et al. (2011).

emergence and promotion of ES as the new frame of reference for environmental policies? What are the implications of such a requalification and its impacts with regard to sustainability requirements (environmental, economic and social)?

4. The example of environmental labelling and certification as a market-based instrument for ES

Environmental labelling and certification (eco-certification) of products²⁴, which is now considered as a form of remuneration for the joint production of ES, has flourished. The number of systems and agrifood products involved, and the size of the market shares for those products, have grown continually since the 1980s, and especially in the last decade (IFOAM, 2011). Environmental labelling and certification systems developed well before the promotion of ES and were originally associated with other forms of justification: such as food safety for human health (organic agriculture), equitable commerce or poverty alleviation (fair-trade), etc. However, they are tending to be increasingly referred to in relation to ES (Soto and Le Coq, 2011). In this perspective, one might wonder about their possible requalification.

Labelling and certification systems are intended to ensure information for consumers and establish a relationship of confidence with producers regarding the characteristics and attributes of products (Ponte, 2004). The attributes of products can be defined as their ability to be checked by the consumer; a distinction is generally made between search attributes (verifiable at the time of the transaction), experience attributes (verifiable after the transaction and consumption of the product) and credence attributes (which are not verifiable and assume confidence in the producer) (Nelson, 1970). These attributes may be linked to the product itself, or to its production and processing.

Generally speaking, certification is a procedure whereby a third party provides a written guarantee that a product, process or service complies with a specific standard, based on an inspection conducted according to an appropriate procedure (Bass et al., 2001 – quoted by Taylor, 2005). Labelling procedures may be less restrictive than certification procedures.

First of all, environmental labelling and certification are a response to the changing demands of consumers. In recent decades, they have evolved to take into account not only the intrinsic characteristics of products, but increasingly their extrinsic characteristics (effect of the production process on the environment, social conditions of workers, animal welfare, etc.). Numerous ecolabelling systems have developed, the oldest one being that of organic agriculture. Its creation, primarily in Europe and the United States, fits in with the search for safer and more sustainable agrifood systems that respect organic processes and integrate them (Raynolds, 2000). The promotion of this new form of agriculture took off with the creation of the International Federation of Organic Agriculture Movement (IFOAM) in 1972, notably in developing countries. Today,

²⁴ Only the certifications and labels intended to differentiate agricultural and agrifood products incorporating an environmental dimension in their specifications are considered here. Geographical indications are not included, though some encompass an environmental component (Boisvert and Caron, 2010). Likewise, the standards of the International Organization for Standardization (ISO) regarding the environmental management of companies, such as ISO 14000, are not included.

on most major consumer markets in the world, organic agriculture is subject to public regulation (labels exist alongside private certification marks which launched the development of organic agriculture) (IFOAM, 2011). Free trade certification and marks are today sometimes seen as possible tools working for environmental conservation (Boisvert and Caron, 2010). Yet, the guarantees offered by such certifications only concern the social organization of production and the sharing of added-value throughout the supply chain. However, the best known fair-trade organization (Fairtrade Labelling Organization – FLO), founded in 1989, encourages all its members to seek double certification (equitable and organic) to more effectively meet consumer requirements. Beyond organic labels and environmental certifications, numerous marks and new certification instruments have developed since the end of the 1990s for many products²⁵.

Environmental certification is related to PES in that, like them, it is an instrument of positive economic incentives, based on voluntary membership²⁶ and directly geared towards conservation (Wunder, 2006). Certification, through the higher selling prices it is supposed bring, is meant to enable remuneration for the efforts made by producers, who contribute towards environmental protection by respecting specifications, just like PES remunerate users of forest or rural areas for producing ES. Lastly, they are voluntary and conditional contractual instruments, insofar as remuneration for efforts depends on the conformity of practices²⁷ (objective of means) implemented by the beneficiary (service producers/certified product producers).

However, unlike PES which are designed for a given area, environmental certification marks and labels are not linked to a territory (Wunder, 2006; Le Coq et al., 2011). They are also adapted to the expectations of consumers – usually living in industrialized nations (Europe, United States, Japan) – and therefore depend on the market on which the products are traded. Thus, there can be no modulation of rules depending on local conditions and on more precise conservation objectives, as in the case of PES. In addition, the amount received under PES is fixed by contract, which is not the case for the amount of the premiums linked to certification. These premiums are not guaranteed, they fluctuate depending on supply and demand, and depending on the balance of power between the different actors in the supply chain²⁸. In addition, the premium is not guaranteed over time, unlike for PES where payments are made

²⁵ For example, in the coffee sector, which is one of the most important products in international trade, in addition to organic labels and environmental certifications there are, today, 6 other certifications, such as *Bird Friendly* created in 1998 by the Smithsonian Migratory Bird Centre, *Utz Kapeh* (today *Utz Certified*) created in 1999 by a group of European retail and distribution companies, *Rainforest Alliance* created in 2003 by the Sustainable Agriculture Network (SAN), *C.A.F.É. practices* (Coffee and Farmer Equity practices) created in 2004 by the Starbucks company, the *Common Code for Coffee Community - 4C*, created in 2005 by private companies and international organizations in the coffee sector with the backing of German cooperation and, more recently, *Nespresso AAA* certification by the Nestlé company in 2006 (Muradian and Pelupessy, 2005; Reynolds et al., 2007; Soto and Le Coq, 2011).

²⁶ Although, in some cases, environmental certifications can be considered as import barriers. For example, it is impossible today to export pineapples to the European market if producers do not have *Global Gap* certification.

²⁷ Practices that are subjected to rules set down beforehand in the PES procedures manual, or in the standard or specifications in the case of Eco-labels. The conformity of practices is checked by accredited certifying bodies (certification by third parties in the case of Organic Agriculture).

²⁸ Only fair-trade offers a minimum price and premiums fixed in advance. Be that as it may, as for other types of certification, producers have no guarantee in terms of outlets. It may prove impossible for them to sell all their production in the fair-trade circuit.

on the basis of multiannual contracts. The producers of certified products (ES providers) therefore bear the transaction risk, which is not the case in PES systems. Moreover, while contract supervision costs are payable by the PES system manager, certification costs are payable by the producers²⁹.

Like PES, environmental labelling and certification are not a uniform category. Certifications are a matter for private operators: the specifications, criteria and reference documents whereby products are assessed are many. For each product, each body has its own rules and standards. As for labels, they are public in the agrifood field: they are official signs adopted as part of national or European public policies. They therefore differ from one country to the next. Labels and certifications are diversified. They are a field of analysis in themselves and are subject to numerous debates about their effectiveness and efficiency (Bass et al., 2001; Grolleau et al., 2004; Nebel et al., 2005; Le Coq et al., 2011).

The environmental effectiveness of environmental labelling and certification, which rely on an obligation of means (respect of generic specifications) is in fact challenged. Whilst work undertaken in industrialized countries in particular on organic agriculture has revealed the positive impacts of organic agriculture specifications in maintaining a certain number of ecosystem services (Fleury, 2011), in developing countries a lack of knowledge is found about the links between soil use and the provision of services³⁰. In addition, the link between certification and the actual change in behaviour and practices of stakeholders newly entering such systems is questioned. Only certain certifications are intended to generate substantial changes in practices and guarantee the effective provision of ES (e.g. *Bird Friendly* certification)³¹. The multiplication of eco-labels and/or certifications involving private marks, resulting from differentiation strategies based on commercial motivations and which are less ambitious in terms of guaranteeing the effectiveness of that link, has been encouraged by an increase in demand for these environmental characteristics (IFOAM, 2011), which constitutes a substantial market niche for agricultural and agrifood products.

The second debate concerns the efficiency of the systems, in financial terms on the one hand, and in terms of efficiency compared to other systems on the other hand. For environmental certification, the main criterion is transmission of the premium paid by consumers to producers, bearing in mind the balances of power within the supply chains considered and operating conditions on the market (Le Coq et al., 2011). In fact, given the multiplicity of middlemen and the asymmetry of power in international supply chains, there is not necessarily a close correlation between the payment granted by consumers and the difference received by the producer.

²⁹ Except when it is covered by cooperation programmes, or as part of incentives for conversion to organic in the case of fair-trade.

³⁰ In particular, although the link between soil use and carbon fixation is relatively well defined for most ecosystems and easily measurable, and the link between soil use and biodiversity is also identifiable and measurable (Hui et al., 2008), albeit more complex, that of soil use and hydraulic service is often difficult to demonstrate given the complexity of hydraulic functioning (Chomitz and Kumari, 1998; Bruijnzeel, 2004; Chagoya, 2008).

³¹ A case study on coffee showed significant differences in practices between certified and non-certified producers (notably in organic agriculture) (Quispe, 2007). However, it is difficult to establish a cause and effect relationship between certification and positive impacts on the environment. Does certification lie behind environment-friendly practices or does certification intervene where those practices already exist?

Lastly, eco-label systems are the subject of a third debate about their role in alleviating poverty and reducing inequalities. In this field, whilst the potential contributions of such systems are acknowledged, notably in reducing the vulnerability of producers (Bacon, 2005), many limitations are highlighted, such as the low production intensity of small-scale producers (Valkila, 2009) or low productivity in the case of certification (Hagggar and Soto, 2011).

The certification tool also has some limitations inherent to a system based on supply and demand for certified products. The certification system is limited by demand, i.e. the capacity of the markets to absorb certified products, and consumers' agreement to pay for these types of products. Indeed, despite growing demand, certified production still outstrips the purchasing capacity of the markets. For example, when the market share of certified coffee underwent substantial development (Giovannucci, 2003), a large share of certified central American coffee production was not sold as such in 2006³². In addition, the certification system is limited by supply in some cases, due to certification costs for producers³³ leading to the smallest farms having difficulties in obtaining certification (Lescuyer et al., 2004), or to excessively limited advantages when costs are considered, compared to the conventional sector. Lastly, being based on trade, the certification system is affected by competition within the same market segment (e.g. fair-trade and/or organic coffee, or the multitude of rival standards in forestry). This competition between countries possessing contrasting comparative advantages (production factor costs – labour costs, access to inputs, etc.) and between producers with contrasting efficiency (due to different technologies) leads to an exclusion, selection and adjustment process which might thus lead to a trend (Villalobos, 2004; Killian et al., 2006). This process is likely to undermine the very principle of the system and its merits as a mechanism for compensating the efforts made by producers through practices helping to guarantee the perpetuation of ES (Le Coq et al., 2011).

All these characteristics mean that, while there no doubt exist some analogies between environmental certification systems and PES, it is not possible to equate these two types of instruments. Not all the products arising from certified processes can be sold as certified products, given the limited demand. In other words, a given level of ES provision does not always lead to remuneration for producers. Next, the value of the premiums – supposed to represent remuneration for ES – depends at least as much on the degree of competition between producers as it does on objective production conditions – including the ES actually provided. Moreover, the premiums are distributed among the different stakeholders in the supply chain, so that only a fraction comes back to the producers, who are at the root of ES provision. It is therefore difficult to see certification as a market-based mechanism in which ES would be the purpose.

Lastly, the sustainability of the certification system, beyond the mere financial aspects, depends on the ability to maintain its legitimacy in the eyes of the payers (consumers) and thus depends on the credibility of the system in terms of effectiveness and efficiency, and in terms of the institutions managing it. One might wonder what the new functions assigned to environmental certifications as

³² In 2006, the volume of certified coffee production was up to six times greater than the volumes actually sold as certified products (authors' estimation based on Pratt and Kilian, 2008).

³³ Under pressure from smallholders in developing countries, IFOAM launched a debate on collective or participatory certification initiatives to promote organic agriculture; this is also the case in industrialized countries with, notably, the initiative promoted by "Nature et Progrès" a private organic agriculture certification mark.

regards ES change in that respect. Does the fact of explicitly presenting them as market tools lead to them being considered more effective or credible?

5. Conclusion

Recent years have seen widespread experimentation with market-based instruments for the provision of environmental goods and ecosystem services. A wide range of mechanisms, such as payments for environmental services schemes, are therefore described as MBIs for ecosystem services. Many believe that market-based approaches can provide powerful incentives to conserve the natural environment and the public goods it provides, while at the same time offering new sources of income to support rural livelihoods. A review found almost 300 examples of such mechanisms worldwide (Landell-Mills and Porras, 2002) and the list grows longer year on year. However, little attention has been paid to their emergence, design and performance and to the effects of the underlying pro-market narrative on conventional environmental policy instruments. Our paper aimed at deepening understanding of the discourse on and politics of MBIs for ecosystem services.

We analysed the interpretation of the notion of ecosystem services in the field of economy. Since its inception, the notion of ecosystem services has been associated with the neoliberal turn in conservation policies. From this perspective, the sustainable provision of ecosystem services is hindered by market failures (e.g. public good attributes, externalities) and prices that do not capture the full value of the natural assets. Depending on how these issues are defined and prioritized, different types of institutional arrangements are suggested as policy tools. The craze for market development has also led to rethink and reword existing conventional policy instruments as MBIs. It has even encouraged a shift in these arrangements, instilling market attributes into them. Generalizations about the virtues and limitations of market-based instruments for improving the management of ecosystems and contributing to rural development are more difficult than usually assumed.

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