NEW TOOLS FOR THE EU AGRICULTURAL SECTOR AND RURAL AREAS. WHAT ROLE FOR PUBLIC POLICY IN PROMOTING PAYMENTS FOR ECOSYSTEM SERVICES?

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Abstract. *In this paper we examine whether it is possible to create a market for ecosystem services deriving from rural landscape and environmental conservation.*

First of all to do this we consider the results of some studies we have conducted in recent years about monetary and non-monetary environmental evaluation. These studies help us first to identify some rural landscape features which improve or worsen landscape appearance and secondly, to discover the willingness of beneficiaries to pay for maintaining these landscape and environmental resources. Then, in order to understand whether social benefits can be increased by using market and economic measures for conservation of landscape and environmental resources, we study Payments for Ecosystem Services (PES). PES are economic instruments used to support the conservation and improvement of ecosystem services. We describe PES for landscape (PaLBeS) and discuss the suitability of introducing it in favour of some ecosystem services in Italy.

Keywords: *payment for ecosystem services, landscape, environmental resources.*

1. Introduction

Rural landscape and environmental resources play a crucial role in providing ecosystem services (Millennium Ecosystem Assessment, 2005). Nevertheless, many landscape features and environmental resources are increasingly being lost in rural areas throughout the world (FAO, 2009). Such loss is of great concern also as regard socio-economic aspects. This is in particular the case of Italy, where rural landscape and environmental resource conservation is essential for developing and improving tourism.

In spite of their importance, the sustainable management of these resources and the provision of their services for the benefit of society are only partially financed by public institutions (Grammatikopoulou *et al*., 2013).

Consequently, in recent years, the use of Coasian approaches such as Payments for Ecosystem Services (PES) are being seen as a complementary tool to guarantee provision of ecosystem services deriving from landscape and environment.

In this paper first we analyse the role of demand and supply for ecosystem services deriving

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from landscape and environmental resources in order to note whther a range of demand and supply factors are leading to an increase in adoption of PES.

Secondly we describe the task of public intervention in favour of PES.

Finally we try to identify the opportunities for developing PES in Italy.

2. Demand for rural landscape ecosystem services

To identify the desired features of landscape, i.e. those that combine to determine a "beautiful landscape", is a highly difficult task (Jindal and Kerr, 2007). Despite having an objective component connected to the features that characterize the landscape, a "beautiful landscape" is a subjective concept, as well illustrated by the European Landscape Convention. In fact, it relates to the different perceptions that people express in relation to landscape attributes (Tempesta and Thiene, 2006). Nevertheless, it is possible to identify some features that generally seem to be able to improve or worsen the beauty of a landscape.

This goal was pursued, for example, by the authors (Marangon *et al.*, 2009) who carried out 1,778 interviews during the period 1999-2008 in order to analyse the preferences of citizens that had utilised or enjoyed the rural landscape in different areas of the North-Eastern part of Italy. Citizens were asked to indicate which objects in the landscape helped to improve or worsen the visible features. They had to assign a 1 to 4 rating scale ("4" means "very important") to these objects. The results of these investigations are set out in Table 1, in which the average values and the standard error of the mean for each are reported.

The results show that the presence of some features could improve the beauty of landscape. In detail, they are: rivers, streams and other waterways; forests; meadows; hedges and rows of trees; typical rural buildings; vineyards; orchards; headlands; poplars. On the one hand, these features and their ecosystem services may become the object of trade in a specific market. On the

Tab. 1- Landscape features assumed to be influential

Variables	Average	Std. Error
Features assumed to improve the landscape		
Rivers, streams, etc.	3,720	0,012
Woodlands	3,660	0,014
Meadows	3,630	0,013
Hedgerows and rows of trees	3,370	0,016
Typical rural buildings	3,370	0,019
Orchards	3,210	0,019
Vineyards	3,170	0,020
Dirt roads	2,960	0,022
Poplars stands	2,570	0,022
Features assumed to worsen the landscape		
Pylons	3,600	0,016
Highways	3,570	0,016
Urban areas	3,390	0,017

Source: Marangon et al., 2009

other, some features contribute to deterioration of the appearance of the landscape, i.e. pylons, motorways and urban areas.

It is worthwhile observing that a beautiful landscape often derives from the combination of several features with sustainable management practices. Consequently, landscape beauty can be the result of the provision of many features and services/benefits by multiple managers. It could, therefore, be difficult to identify a specific service/benefit connected to a qualitative aspect of the landscape. Moreover sometimes it may be necessary to involve several (or all) potential suppliers of landscape beauty to obtain a visual benefit, since otherwise it may not be possible to guarantee an optimal provision of ecosystem services from the social point of view.

In spite of these difficulties, it could be useful to develop innovative markets to improve the maintenance and conservation of some landscape complements in order to increase opportunities of local socio-economic development.

3. Supply of rural landscape ecosystem services

The multifunctional role of agriculture emphasizes the ability to provide not only market goods, such as food and fibers, but also further goods (or "bads"), which are not all traded on the market. Within this latter group of goods are also the ecosystem services derived from landscape and environmental resources. These further goods are produced jointly with market goods (Commodity Outputs - COs). Some of these "secondary" products are traded on proper markets, but most of them are externalities or public goods (Non-Commodity Outputs - NCOs). The lack of adequate markets or their malfunctioning creates market failure, which requires the intervention of government, in order to obtain an optimum level of supply.

The institutional intervention can use different tools, such as Command and Control instruments or economic/financial incentives, to support the provision of ecosystem services from the conservation of landscape resources. But the first type of instrument has proved to be inadequate to counteract the loss of ecosystem services resulting from the abandonment of a landscape, especially in rural areas, while the second seems to be more effective. In detail, financial incentives have been adopted not only to maintain rural landscape and environmental features, but also to support projects to enhance their level of quality.

Financial incentives act with the intention of securing the provision of ecosystem services/public goods using different types of schemes. Nevertheless, this institutional intervention aimed at cancelling the divergence between private and social costs is able only partially to support the provision of ecosystem services.

As regards intervention by the European Union through the Common Agricultural Policy (CAP), the presence of financial incentives in favour of sustainable management of rural landscape are to be found in the documents created to support rural development, the Rural Development Programmes.

These documents contain some financial measures created to improve the quality of rural landscape. The incentives are present mainly in the axis devoted to environmental intervention (Rete Rurale Nazionale, 2009) and, more precisely, in the so-called agri-environmental measures. These economic tools commit farmers to adopt a sustainable practice, that goes beyond usual good-farming practices concerning rural landscape and environmental resources, for a minimum period of five years. The incentive compensates contractors for additional costs and income losses resulting from the commitment. This type of financial incentive is not coupled, which helps to

limit the distorting effects. Nevertheless knowledge of the impacts of these institutional incentives on the landscape and the provision of ecosystem services is still lacking. In fact, despite the great importance attached by the European Commission to the financial support in favour of the preservation and improvement of rural landscape, there is only occasional use of environmental evaluation methods in order to quantify the benefits deriving from the implementation of such measures. These institutional financial incentives are, moreover, able to support only a part of the provision of ecosystem services.

4. Payments for Ecosystem Services

In order to avoid distortions and inefficiencies it appears necessary to identify the most appropriate tool to support the provision of landscape ecosystem services which should be targeted, flexible and transparent.

Institutional intervention is not necessarily always the best choice, as there may be alternative, better tools.

Although it may seem paradoxical to use market instruments for a situation of market failure (Farley and Costanza, 2010), sometimes the use of these tools appears to provide a suitable solution.

The market-based instruments include direct payments (subsidies, tax incentives and payments). This aggregate gathers various types of incentives used to maintain or restore the supply of ecosystem services and includes PES.

PES is constituted by a payment for the provision of an ecosystem service (or use of the soil which allows the service to be produced). This service must be configured as an externality. In fact, while some ecosystem services are produced with the specific intention of being sold/consumed, others are configured as externalities.

Although the identification of the importance of the services provided by landscape and environmental resources is not recent, the introduction of the concept of PES can be placed at the end of the 'nineties, due to the rapid development of the tool.

The concept of PES is sometimes implemented using alternative labels, such as Compensation for Ecosystem Services (CES), or Compensation and Rewards for Environmental Services (CRES).

A definition produced by Wunder (2005) tries to clarify the concept, indicating five basic principles for better indentifying PES. In detail, PES is: i) a voluntary transaction, in which ii) a well-defined ecosystem service (or a use of land to secure it) iii) is acquired by at least one buyer from, iv) at least one supplier (farmer, manager of a protected area, etc.) that actually controls the supply of the service, v) if and only if the provider ensures the provision (conditionality). According to a revised, broader definition (Tacconi, 2012, p. 35) PES is "a transparent system for the additional provision of environmental services through conditional payments to voluntary providers".

5. Payments for Rural Landscape Beauty Services

As stated above PES is built on compensation flows from the beneficiaries of an ecosystem service to its provider. Here we call attention to what can be termed "Payments for rural Landscape Beauty Services" (PaLBeS).

PaLBeS provide compensations in favor of landscape managers that supply aestethical and recreational benefits to residents, tourists, hunters, fishers or other citizens. It is necessary to

consider that from the landscape we can derive further services (i.e. spiritual, religious, intrisic, existence, etc.) (World Resources Institute, 2009).

From a PES scheme created in Costa Rica, several, further PES have been created in favor of landscape beauty. Mainly they have been built according to the public scheme. In fact, the public administration has provided several measures for safeguarding rural landscape conservation, such as, for example, the agri-environmental payments in the European Union, which provide financial resources to farmers for adopting more friendly practices[1] towards landscape ecosystem services This type of publicly-financed PES, however, is unable to reach optimal levels of effectiveness and efficiency (Pagiola and Platais, 2007).

On the basis of users' preferences and their willingness to pay (WTP) for specific landscape features, it seems suitable to create some user-financed PES schemes to counteract the problems of publicly-financed PES: as stated above they could be named PaLBeS tools.

In this type of PES, we can identify the relevant presence of direct payments provided by tourism enterprises in order to assure the presence of landscape beauty, as it is very important tourist attractions (Allali, 2009; UNESCAP, 2009). In these cases, landscape managers receive directly from tourism enterprises a payment to maintain a sustainable practice, conserve or improve specific features of rural landscape, or assure the presence of more biodiversity.

In some cases, PaLBeS are created among tourism enterprises and local communities in order to avoid shooting in the areas frequented by tourists for bird-watching, nature photography, etc. (Wunder, 2005). PaLBeS can be concluded by a tour operator belonging or not to the affected area. The creation of a PaLBeS by local tour operators could be an important tool also for developing local socio-economic activity thus bypassing the mechanisms of vertical integration implemented by larger tour operators.

It is possible to create two schemes of PaLBeS: tour operators may i) contract directly with land managers to maintain an ecosystem service or ii) create contracts for the local supply of labor, food, etc., paying a premium price (Robertson and Wunder, 2005). In the latter case, the premium price is designed as a PaLBeS.

We can identify a PaLBeS scheme also in (or near) protected areas when a portion of the ticket paid by visitors is given to local land managers. In detail, the payment is stipulated in favor of local managers in order to protect and maintain the existing landscape features (Milder *et al.*, 2010).

Although the benefits arising from the development of PaLBeS in favor of rural landscape are usually considered to benefit only local residents and tourists, or those who can easily enjoy landscape for recreational purposes, it must not be forgotten that i) there are some benefits that potentially affect a greater portion of present and future users and ii) some people derive a benefit simply from the awareness of the existence of a natural beauty (i.e. non-use values).

The role of the private sector in developing PaLBeS could still be expanded (Landell-Mills and Porras, 2002; Milder *et al.*, 2010; Waage, 2007). In fact, potential customers in a market for beautiful landscape features and environment could be not only private tour operators, individual or associated, but also entrepreneurs in specific activities, hunters, fishermen and tourists. Amongst these it is important to focus attention on those engaged in sustainable tourism activi-

[1] We refer to farmers because "Agricultural landscapes hold tremendous potential for producing a diverse stream of ecosystem services" (Goldman *et al.*, 2007) and "since agricultural producers are the largest group of ecosystem managers in the world, their activities may produce (or reduce) ecosystem services" (Lipper *et al.*, 2009, p. 2). Moreover "Environmental services also comprise benefits associated with different types of actively managed ecosystems, such as sustainable agricultural practices and rural landscapes" (Muradian *et al.*, 2010, p. 1202).

ties with regard to environmental resources, such as eco-tourists (FAO, 2007). In fact, ecotourism can contribute to sustainable management and conservation of landscape ecosystem services, in particular if payments are addressed to conservation (Yadav *et al*., 2013). The creation of collective PaLBeS schemes could be suitable for ecosystem services provided by landscape derived from synergistic provision: firstly, they facilitate the creation of an aggregate PaLBeS where users can combine their payments and secondly they could improve cooperation among farmers. In fact, only if a sufficient number of farmers act to protect rural scenic beauty is it possible to achieve a high quality landscape (Goldman *et al*., 2007).

Nevertheless it has been found that the presence of a single buyer (monopsony) of landscape beauty services is rather frequent (Wunder, 2005).

According to a broad definition of PES, such as that proposed by FAO (2007) which takes into account the green premium price of a product, an interesting opportunity for the ecosystem services provided by rural landscape beauty seems to come from PES constructed through the certification of agricultural products (Robinson and Keenan, 2010). In particular, we refer to the case of certification that aims at maintaining specific landscape and biodiversity. The certification should permit the widest range of ecosystem services attributable to a specific landscape to be taken into account and, in particular, the services that are difficult to evaluate (Huberman and Shepherd, 2010). In this context, expanding the scope of PES schemes by creating some "landscape labels" (Ghazoul *et al*., 2009; Unseld, 2007) aimed at labelling all goods and services originating from a specific area/landscape should allow the inclusion also of those ecosystem services that arouse less interest owing to difficulties in their identification and quantification (i.e. cultural services). It is, nevertheless, important to be aware about the confusion deriving from the presence of a multitude of labels and their adverse effects, both in economic and environmental terms.

In favor of this type of PaLBeS some studies reveal significant positive effects for European Union farmers, whose products do not currently seem to be able to meet the growing demand for certified agricultural products (Forest Trends and The Ecosystem Marketplace, 2008).

The development of PaLBeS, schemes created on the basis of certification allows the involvement of different types of economic agents: for example, the sellers may have various structures,since both the producers (and also exporters, brokers, distributors, etc.) and consumers can act like buyers. A cooperative approach able to coordinate the actions of the economic agents involved is important in the case of certification: in particular it allows a reduction of costs involved in implementation of PaLBeS.

An important positive effect of a PES scheme that provides or maintains landscape beauty is the increase in the value of local resources, especially real estate, that benefit from a better landscape: the process of price appreciation can be evaluated through appropriate estimation methodology, such as the hedonic price method (Rosen, 1974).

On the one hand, PaLBeS seems to have significant positive consequences, especially in some landscape contexts, such as the Italian one. On the other hand, there are considerable difficulties in their implementation. An example of this situation is the impossibility, in certain contexts, of separating the ownership of the ecosystem services from landscape ownership in general. This problem prevents the creation of a market.

A further problem in the development of PaLBeS is the non-excludability faced by managers of landscape. This obstacle makes payments to the landscape similar to benefit-sharing schemes, or management at community level, rather than to PES schemes (Milder *et al*., 2010).

These difficulties are partially overcome if the rights to control access to landscape are put in the hands of local communities.

As stated above, the potential role of cooperative approaches is strategic, in particular when it supports the implementation of PaLBeS. In fact, conservation and provision of ecosystem services related to landscape are the result of the synergic action of all stakeholders present in an area. The achievement of consensus and sharing of rules are necessary steps for obtaining ecosystem services (Farley and Costanza, 2010).

Cooperation may be an opportunity for coordinating not only the supply side but also the demand for ecosystem services and consequently the purchasers of the services. Moreover a partnership approach can help reduce transaction costs associated with the implementation of PES schemes.

The preparation of an adequate system of sharing and using resources collected by the local community should also allow management mechanisms free from distortion (corruption, waste of resources, etc.) (Lindsey *et al*. 2007).

The development of a PaLBeS requires the creation of synergy among different activities: i.e. conservation of rural landscape and environmental resources, eco-tourism, production of quality goods and marketing are some of the activities that must act in harmony (Robinson and Keenan, 2010).

It is necessary to make clear that PaLBes is only one part of a set of tools aimed at the conservation and improvement of landscape ecosystem services (Table 2).

Firstly there is the traditional institutional intervention that requires the preservation of a beautiful scenic resource through instruments such Command and Control approaches. The creation of parks and protected areas is an example of application of this measure, which draws on public funds, or funds raised through entrance fees, permits, etc. Similarly, the actions of urban planning are part of this type of intervention.

Secondly, we identify cases in which the market encourages the conservation of the landscape. In particular, on the real estate market assets near beautiful landscapes appreciate. Also the conservation of the provision of ecosystem services based on purchasing or renting of land passes through market as a normal transaction.

Further forms of payment mechanisms come from some experiences of joint ventures between tourism operators and managers of landscape (Landell-Mills and Porras, 2002).

Tab. 2 - Tools in favor of the conservation of landscape beauty

Command & Control	Payment for Ecosystem Services - PES				Market	Voluntary instruments
	public	public-private	private	(certification)		
Urban Planning Parks, Protected areas, etc.	Subsidies, agro-environmental payments, etc.	Tickets, entrance fees, etc.	Trading with tour operators, payments for leisure activities	Labels	Price of property	Sponsorship with Internet
	Management agreements				Lease or purchase	Voluntary contributions, donations

Source: our elaboration

A market in favor of landscape can be created even by philanthropic foundations that attempt to mobilize the willingness to pay of private individuals to maintain landscape beauty. In this case, public awareness of environmental problems is necessary and that seems still to be

lacking. It should also be considered that donations generally do not respect the character of conditionality and do not require an exact definition of the ecosystem service (Robertson and Wunder, 2005).

An innovative market for landscape beauty is also created by Internet: an example is the case of the site EcologyFund.com, in which users are given the option to "click" appropriate keys present in site to provide financial resources for the maintenance of landscape and environmental resources identified by specific associations. However, the funds do not come from users, but from the sponsors of the site.

In this framework, in an appropriate context it seems that PaLBeS could also play an important role in managing and conserving landscape and environmental resources (UNECE, 2007; Waage, 2007). Although these PES need to be supported by the work of specific organizations and implemented by appropriate flexible schemes (Landell-Mills and Porras, 2002), they seem to supply interesting opportunities for landscape ecosystem services provision.

Moreover PaLBeS seem to provide excellent prospects for socio-economic as well as environmental resources, both in developing countries and in developed countries, where PES schemes have been implemented almost exclusively under the public sector.

6. Payments for Landscape Beauty in Italy

Last, but not least, it seems interesting to explore the opportunities for implementing PaLBeS in the Italian context, where rural landscape is a resource of great interest for local socio-economic development. In particular, it has a positive impact on the development of local tourism activities.

To try to assess the opportunities for implementing PaLBeS schemes in the Italian context, the results obtained from the above mentioned studies carried out to identify citizen'preferences for landscape and environmental complements and to define a monetary estimate of them are of some interest..

These data and the results of recent studies conducted in other areas of Italy (Bossi Fedrigotti *et al.*, 2011; Tempesta and Thiene, 2006) allowed us to estimate that the preservation of the rural landscape produces benefits for the community of around € 60 per year per household (Tempesta and Thiene, 2006). Extending data to national level it is possible to quantify the national benefits from the preservation of scenic resources: they amount to € 1,290 million per year.

These results highlight the fact that ecosystem services deriving from landscape produce considerable benefits to citizens. These benefits received by the community from the conservation and enhancement of the landscape seem to be high. Therefore, in Italy there is the opportunity to develop some PaLBeS schemes in favor of rural landscape resources. In particular, it seems desirable to develop PaLBeS schemes in several Italian rural areas in accordance with the preferences expressed by respondents in favor of specific landscape features and their benefits.

On the basis of the importance of tourism in Italy, especially as regard tourism linked to nature, the idea of using the PaLBeS tool to support this economic activity could play a significant role in developing socio-economic systems and conserving landscape and environmental resources. In fact, "green" tourism, i.e. tourism linked to landscape and environmental resources, is experiencing positive trends, in contrast with other types of tourism (Ecotur, 2011). The increasing number of green-tourists in Italy points to the desire to spend leisure time in contact with landscape and environmental resources. This seems to offer a viable opportunity for

developing PaLBeS, in which tour operators or users of the same resources can act as buyers of ecosystem services provided by managers of these resources.

Moreover PaLBeS may be a useful tool to make explicit the costs and benefits associated with the use of portions of soil and landscape for the production of renewable energy sources. For example, there is a heated debate about whether land in Italy should be used for the installation of wind turbines or photovoltaic panels. The implementation of PaLBeS in this context could be a solution for balancing the needs of various stakeholders, such as, for example, on the one hand the desire to obtain benefits of increased income for land managers and minor environmental impacts (quality of air, water, etc.), and on the other hand, to consider costs related to the inclusion in the landscape of extraneous features and possible negative impacts on activities related to landscape resources.

The use of PaLBeS does not exclude the presence of other tools (Engel *et al.*, 2008). In particular, considering PaLBeS features it could be affirmed that it is not the most suitable approach in any field or the best solution for achieving any goal. In fact, the choice of the best instrument depends on the characteristics of the ecosystem service, taking into account the the relationship between the ecosystem service and other benefits provided by landscape.

7. What role for public policy?

Although PES originated as a market solution for the sustainable management of ecosystem services, with the specific goal of creating an alternative to public management, the role of government in developing PES could be decisive (Vatn, 2009). In particular, its role in reducing transaction costs related to the nature of the traded goods is relevant.

Public intervention in favor of the diffusion of PES can occur with several degrees of engagement. In fact, firstly we can have the traditional role of the institutional decision maker, secondly the government can act as an intermediary, a promoter/financier of PES, but it could also be a seller of ecosystem services. The latter is the case in which the government is the owner of the landscape and environmental resources. In this case, PES is necessary to fund the conservation activities carried out by the government (Pagiola *et al.*, 2002).

The government may take part in a PES scheme in order to remove barriers that could prevent or cause difficulties in starting a market between suppliers and users of ecosystem services. In fact, there are some situations that could prevent its development, among which, high transaction costs related to the implementation of a PES scheme and relative negotiation of agreements. These costs are often due to the presence of supply and demand by individual economic agents. In this case the key role that the government can play is that of bringing together buyers and sellers or stimulating the market mechanism by providing appropriate information, training and awareness in the community (Gutman, 2007). The institutional task is, moreover, to increase public awareness about the benefits deriving from the sustainable use of landscape and environmental resources, inviting citizens to ensure their protection, through the payment of a price for the benefit they receive.

Furthermore, the government must guarantee citizens the right to enjoy the essential ecosystem services, even when they have not the necessary financial resources to pay for them. In fact, it is important that ecosystem services are not considered as luxury goods. In this case the government must intervene directly by financing the creation of a PES.

There are several examples of PES where government is a buyer. The main example in the

European Union context is the case of agri-environmental payments, contained in the Rural Development Programmes. However, Pagiola and Platais (2007) pointed out that public-financed PES (government acts as a purchaser on behalf of users), such as the agri-environmental measures mentioned above, appears less efficient than those directly funded by users. Their inefficiency derives firstly from the lack of direct information about the value of the ecosystem services perceived by beneficiaries. Another source of inefficiency is the inability of the government to monitor the supply of the service, and the absence of incentives to ensure the efficiency of PES.

Publicly-financed PES is, moreover, often a uniform payment in favor of ecosystem services providers. It is characterized by a low spatial differentiation and a lack of specific targets. In addition Pagiola and Platais (2007) show that often in publicly-financed PES the payment is tied to the inputs rather than to the actual provision of services. The cause of this gap stems from the impossibility of observing the level of provision of ecosystem service that leads to adoption of incentives related to the use of production factors (e.g. land). This situation could create potential distortions at the expenses of PES effectiveness and efficiency.

Furthermore, on some occasions, publicly-financed PES makes citizens less responsible, eroding their sense of duty to protect ecosystem services (Neely, 2008). In fact, if this task is attributed to the government, citizens are not stimulated to develop private transactions.

Nevertheless, publicly-financed PES has the opportunity of achieving economies of scales for transaction costs, given the considerable breadth of action that characterizes this type of scheme.

Although less efficient, however, there are some cases in which publicly-financed PES remains the only option: for example, when there is a significant conflict of interest between beneficiaries and providers of an ecosystem service or an increase in transaction costs or incentives for opportunistic user behaviour (Wunder *et al.*, 2008).

Publicly-financed PES is sometimes able to achieve objectives that a user-financed PES is not able to obtain: for example, it seems to be possible to reduce poverty in developing countries through the creation of a publicly-financed PES. In these contexts PES should be mainly aimed at improving local economic conditions, providing opportunities for the integration of income or additional services to the population (training, technical assistance, etc.).

The use of PES to achieve further issues could, however, on the one hand, confirm the importance of institutional support to ensure a certain level of quality of life for the local population but, on the other hand, it may jeopardize the achievement of the primary objectives, i.e. the provision of ecosystem services. The main difference between PES created in developing countries and PES in developed socio-economic systems concerns the presence, in the first case, of the above-mentioned further targets.

8. Concluding remarks

There are still important difficulties to be resolved in order to develop optimal patterns of PES in favor of rural landscape. First of all, the problems in i) estimating the value of an ecosystem service and its price, ii) identifying the best type of contract to ensure optimal deployment from a social perspective, and iii) the need to evaluate the consequences arising from the application of a PES. The evaluation requires the ability to use appropriate indicators and a sufficiently long period of time to observe and determine the impact of PaLBeS on landscape features and complements (Marangon *et al.*, 2007).

Nevertheless, the positive effects that seem to follow from a suitable use of PaLBeS argue in

favor of its extensive use in the future, following a trans-disciplinary approach (Farley and Costanza, 2010), based on considerations regarding not only efficiency but also equity and sustainability.

In any case, the choice of the most suitable measures must be made according to the characteristics of the ecosystem service in question.

Each tool created in favor of landscape conservation could be the best to maintain or increase the supply of ecosystem services provided by the rural landscape according to the context. Moreover the choice of one tool does not preclude the use of the others: in fact, each context and ecosystem service requires an appropriate solution (Troiano and Marangon, 2011).

REFERENCES

Allali K. (2009), Agricultural landscape externalities, agro-tourism, and rural poverty reduction in Morocco, in Lipper L., Sakuyama T., Stringer R., Zilberman D. (eds), *Payments for environmental services in agricultural landscapes*, FAO, Berkeley: Springer, 189-220.

Bossi Fedrigotti V., Fischer C., Marangon F., Troiano S. (2011), *Payments for Ecosystem Services (PES) for traditional land-use systems in South Tyrol, Italy: the case of chestnut orchards and their recreational benefits*, International Conference on Payments for Ecosystem Services, 10-12nd November, Berlin.

Ecotur (2011), *IX Rapporto Ecotur sul Turismo Natura*, Pescara.

Engel S., Pagiola S., Wunder S. (2008), Designing payments for environmental services in theory and practice: an overview of the issues, *Ecological Economics*, 65: 663-674.

FAO (2007), *The state of food and agriculture. Paying farmers for environmental services*, FAO Agriculture Series 38, Rome.

FAO (2009), *Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*. Food and Agriculture Organization of the UN, Rome.

Farley J., Costanza R. (2010), Payment for ecosystem services: from local to global, *Ecological Economics*, 69: 2060-2068.

Forest Trends, The Ecosystem Marketplace (2008), *Payments for Ecosystem Services: Market Profiles*, http://ecosystemmarketplace.com/documents/acrobat/PES_Matrix_Profiles_PROFOR.pdf (October 2013)

Ghazoul J., Garcia C., Kushalappa C.G. (2009), Landscape labelling: a concept for next-generation payment for ecosystem service scheme, *Forest Ecology and Management* 258: 1889-1895.

Goldman R.L., Thompson B.H., Daily G.C. (2007), Institutional incentives for managing the landscape: Inducing cooperation for the production of ecosystem services, *Ecological Economics*, 64: 333-343.

Grammatikopoulou I., Pouta E., Salmiovirta M. (2013), A locally designed payment scheme for agricultural landscape services*, Land Use Policy*, 32: 175-185.

Gutman P. (2007), Ecosystem services: Foundations for a new rural-urban compact, *Ecological Economics*, 62: 383-387.

Huberman D., Shepherd G. (2010), Delivering Environmental Services in Landscapes: experiences with PES through IUNC's Livelihoods and Landscapes Strategy, *Mountain Forum Bulletin*, January: 14-17.

Jindal R., Kerr J. (2007), *Payments for Scenic Beauty*, http://sanrem.cals.vt.edu/1010/PESbrief2.4.ScenicBeauty.pdf (October 2013).

Landell-Mills N., Porras I.T. (2002), *Silver bullet or fools'gold?* London: IIED.

Lipper L., Sakuyama T., Stringer R., Zilberman D. (eds) (2009), *Payments for Environmental Services in Agricultural Landscapes: Economic Policies and Poverty Reduction in Developing Countries*, Rome: Food and Agriculture Organization of the United Nations (FAO) and Springer Press.

Lindsey P.A., Roulet, P.A., Romañach S.S. (2007), Economic and conservation significance of the trophy hunting industry in sub-Saharan Africa, *Biological Conservation*, 134(4): 455-469.

Marangon F., Troiano S., Rainis M. (2007), Un'opportunità da non perdere: l'introduzione di incentivi a sostegno delle esternalità positive del processo di produzione agricola, in Brunori G., Marangon F., Reho M. (eds), *La gestione del paesaggio rurale tra governo e governance territoriale*, Milan: FrancoAngeli, 101-139.

Marangon F., Tempesta T., Troiano S. (2009), *Rural Landscape Preferences: socio-economic analysis in the North-East of Italy*, 15th International Symposium on Society and Resource Management (ISSRM 2009), Meet old and new worlds in research, planning and management, Vienna (A), 5-8 July 2009.

Milder J.C., Scherr S.J., Bracer C. (2010), Trends and Future Potential of Payment for Ecosystem Services to Alleviate Rural Poverty in Developing Countries, *Ecology and Society*, 15(2), 4, http://www.ecologyandsociety.org/vol15/iss2/art4/ (October 2013).

Millenium Ecosystem Assessment (2005), *Millenium Ecosystem Assessment, Ecosystems & Human Wellbeing, Synthesis*, Washington: Island Press, www.MAweb.org (October 2013).

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

Neely H. (2008), *Restoring Farmland to Wetlands: The Potential for Carbon Credits in Eastern North Carolina*, Duke University Master's Project.

Pagiola S., Landell-Mills N., Bishop J. (2002), Making Market-based Mechanisms Work for Forests and People, in Pagiola S., Bishop J. e Landell-Mills N. (eds). *Selling Forest Environmental Services*, London: Earthscan, Londra, 261-290.

Pagiola S., Platais G. (2007), *Payments for Environmental Services: From Theory to Practice*, Washington: World Bank.

Rete Rurale Nazionale (2009), *Paesaggio e sviluppo rurale.* Ministero delle politiche agricole alimentari e forestali, Rome.

Robertson N., Wunder S. (2005), *Fresh Tracks in the Forest*, CIFOR, Bogor Barat.

Robinson R. Keenan L. (2010), The Rhoen Biosphere Reserve: Developing new marketing strategies to conserve a traditional agricultural landscape, *Mountain Forum Bulletin*, January: 60-64.

Rosen S. (1974), Hedonic prices and implicit markets: product differentiation in pure competition, *The Journal of Political Economy*, 82(1): 34-55.

Tacconi L. (2012), Redefining payments for environmental services, *Ecological Economics*, 73: 29-36.

Tempesta T., Thiene M. (2006), *Percezione e valore del paesaggio*, Milan: FrancoAngeli.

Troiano S., Marangon F. (2011), I Payments for Ecosystem Services: opportunità di sviluppo nella tutela delle risorse paesaggistico-ambientali, *Economia delle fonti di energia e dell'ambiente*, 3/2010: 87-113.

UNECE (2007), *Recommendations on Payments for Ecosystem Services in Integrated Water Resources Management*, United Nations, New York and Geneve.

UNESCAP (2009), *Payments for ecosystem services*, United Nations, Bangkok.

Unseld L. (2007), *Branding the Landscape - a Guide*. Regionalvermarktung Unseld, Vorstadt 2, Langfurth, Germany

Vatn A. (2009), An institutional analysis of payments for environmental services, *Ecological Economics*, 69: 1245-1252.

Waage S. (2007), *Investing in the Future: an Assessment of Private Sector Demand for Engaging in Markets & Payments for Ecosystem Services*, FAO e Forest Trends, http://www.katoombagroup.org/documents/tools/FT-FAO_Private%20Sector%20Buyers%20Report%20_Mar%2007.pdf (October 2013).

World Resources Institute (2009), *Banking on Nature's Assets*, http://pdf.wri.org/banking_on_natures_assets.pdf (October 2013).

Wunder S. (2005), *Payments for environmental services: some nuts and bolts*, CIFOR Occasional Paper 42, http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-42.pdf (October 2013).

Wunder S., Engel S., Pagiola S. (2008), Taking Stock: a comparative analysis of Payments for Environmental Services Programs in Developed and Developing Countries, *Ecological Economics*, 65: 834-852.

Yadav L.P., O'Neill S., Van Rensburg T. (2013),"Supporting the Conservation of Farm Landscapes Via the Tourism Sector, *The Economic and Social Review*, 44(2): 221-245.