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Which role for public policy?

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New tools for EU agricultural sector and rural areas. Which role for Payments for Ecosystem Services?

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New tools for EU agricultural sector and rural areas.

Which role for Payments for Ecosystem Services?

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Abstract

In this paper we try to understand if 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 conducted during last years about monetary and no-monetary environmental evaluation. These studies help us firstly to identify some rural landscape features able to improve or to worsen landscape aspect and secondly to point out the willingness to pay of beneficiaries to maintain landscape and environment features. Then to understand if it is possible to increase social benefits by using market and economic instruments in favor of landscape and environmental resources conservation, we study Payments for Ecosystem Services (PES). PES are economic instruments that can be used to support ecosystem services conservation and improvement. We describe this instrument and discuss the opportunity to introduce it in favor of some ecosystem services in Italy.

Keywords: Payment for Ecosystem Services, landscape, environmental resources.

JEL classification: Q56 - Environment and Development; Environment and Trade; Sustainability; Environmental Accounts and Accounting; Environmental Equity; Population Growth.

1. INTRODUCTION

Rural landscape and environmental resources play a crucial role in providing ecosystem services (Millennium Ecosystem Assessment, 2005). Nevertheless many landscape complements and environmental resources are increasingly being lost in rural areas worldwide (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 resources conservation is essential to develop and improve tourism activities.

In spite of their importance, the sustainable management of these resources and provision of their services to benefit society are only partially financed by public institutions.

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 ecosystem services provision deriving from landscape and environment.

In this paper first we analyse the role of demand and offer for ecosystem services derived from landscape and environmental resources. We note that a range of demand and supply factors are leading to an increase of PES adoption.

Then we describe the task of public intervention in favor of PES.

Finally we try to point out the opportunities of developing PES in Italy.

2. DEMAND OF RURAL LANDSCAPE ECOSYSTEM SERVICES

To identify the desired features of the landscape, i.e. those that combine to determine a "beautiful landscape", is a task pregnant with difficulties (Jindal and Kerr, 2007). Despite having an objective component connected to the features that characterize the complements, the beautiful landscape is a subjective concept, as well as illustrated by the European Landscape Convention (Council of Europe, 2000). 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 certain features that generally seem to be able to improve or worsen the beauty of a landscape.

This goal was pursued, for example, by conducting 1,778 interviews. They were carried out during 1999-2008 period (Marangon *et al*., 2009) in order to analyse the preferences of citizens that had exploited the rural landscape in different areas of the North-Eastern part of Italy. Citizens were asked to indicate which landscape complements helped to improve or worsen the appearance by assigning a 1 to 4 rating scale ("4" means "very important"). 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 complement are reported.

The results show that the presence of some landscape complements 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. These features and their ecosystem services may become the subject of trade in a specific market. Instead, some complements contribute to deteriorate the appearance of the landscape: i.e. pylons, motorways and urban areas.

Table 1: Supposed influencing landscape features

Variables	Media	Std. Error Media
Supposed improving landscape features		
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

Supposed worsening landscape features		
Pylons	3,600	0,016
Highways	3,570	0,016
Urban areas	3,390	0,017

Source: Marangon *et al*., 2009

However a beautiful landscape derives often by combining some complements and sustainable management practices.

A beautiful landscape can also be the result of providing more features and services/benefits by multiple managers. It may therefore be difficult to identify a single service connected to the qualitative aspect of the landscape. Moreover in same occasions it could be necessary the involvement of several (or all) potential suppliers of landscape beauties. Otherwise it could not be possible to guarantee an optimal provision of ecosystem services from the social point of view.

3. OFFER OF RURAL LANDSCAPE ECOSYSTEM SERVICES

The multifunctional role of agriculture emphasizes the ability to provide not only market goods, such as food and fiber, but also further goods (or "bads"), which are not all traded on the market. Inside the group of these goods there are also the ecosystem services derived from landscape and environmental resources. These further goods are jointly produced with market goods (Commodity Outputs - COs) (OECD, 2001). Some of these "secondary" products are traded on proper markets, but most of them is externalities or public good (Not Commodity Outputs - NCOs). The lack of adequate markets or their malfunction creates the market failure, which involves the intervention of the government, in order to obtain a level of optimum supply.

The institutional intervention can use different tools, like Command and Control instruments or economic/financial incentives, in order to support the provision of economic services from landscape. More precisely, while the first ones proves to be unable to counteract the loss of ecosystem services resulting from the abandonment of an economic landscape, especially in rural areas, the second ones seems to act better. In detail, the financial incentives were adopted not only to maintain rural landscape and environmental features, but also to support projects to enhance their quality level.

The financial incentives act with the intention to secure the provision of ecosystem services/public goods using different types of incentives. Nevertheless institutional intervention aimed at cancel the divergence between private and social costs is able to support only a part of ecosystem services provision. As regards the European Union intervention through the Common Agricultural Policy (CAP), it is possible to identify the presence of financial incentive in favor of the sustainable management of rural landscape in the documents created to support rural development, the Rural Development Programmes.

These documents contain some financial measures in favor of landscape. Mainly these measures are present in the axis devoted to environmental intervention (Rete Rurale Nazionale, 2009) and more precisely in the so-called agri-environmental measures. These incentives engage farmers for a minimum period of five years to adopt a sustainable management of rural landscape and environmental resources that goes beyond usual good-farming practices. 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 there is still a lacking knowledge of the impacts of these institutional incentives on the landscape and the provision of ecosystem services. In fact, in spite of the great importance attached by the European Commission to the financial support in favor of the preservation and improvement of rural landscape, there is only an occasional use of the environmental valuation methods in order to quantify the benefits deriving from the implementation of such measures.

Moreover these financial incentives are able to support only a part of ecosystem services provision.

4. PAYMENTS FOR ECOSYSTEM SERVICES

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

The institutional intervention is not necessarily always the best choice, because there may be alternative, better tools.

Although it may seem paradoxical to use market instruments from a situation of market failure (Farley and Costanza, 2010), 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 including PES.

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

Although the recognition of the importance of the services provided by landscape and environmental resources is not recently, 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 formalize the concept identifying five basic principles for the identification of a 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 service, v) if and only if the provider ensures the provision (conditionality).

5. PAYMENTS FOR RURAL LANDSCAPE BEAUTY SERVICES

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 a compensation in favor of landscape managers that provide aestethical and recreational benefits to residents, tourists, hunters, fishers or other citizens. It is also necessary to consider that from the landscape we can derive further services (i.e. spiritual, religious, intrisic, existence, etc.) (World Resources Institute, 2009).

From PES scheme created in Costa Rica, several further PES have been creating in favor of landscape resources. Mainly they have been built according to the public scheme. In fact, public administration has provided several interventions to safeguard rural landscape conservation, as for example agri-environmental payments in the European Union, which consist of financial resources provision to farmers to adopt more landscape ecosystem services-friendly practices[1]. However, this type of public-financed PES is not able to reach optimal levels of effectiveness and efficiency (Pagiola and Platais, 2007).

On the basis of users' preferences and their willingness to pay (WTP) in favor of specific landscape features, it seems to be suitable to create some users-financed PES schemes.

Among 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 beauties, as they are very important tourism 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, PES are created among tourism enterprises and local communities in order to avoid hunting in the areas attended by tourists for bird-watching, nature photography, etc. (Wunder, 2005). Moreover ecotourism can contribute to sustainable management and conservation of landscape ecosystem services, in particular if payments are addressed to conservation.

PES can be concluded by a tour operator belonging or not to the affected area. The conclusion of a PES by local tour operators could be an important tool also to develop local

[1] We refer to farmers as "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).
1.

economic activity and bypass the mechanisms of vertical integration implemented by great tour operators.

The tour operator may contract directly with the land managers to maintain an ecosystem service or create contracts for the local supply of labor, food, etc., paying a premium price (Robertson and Wunder, 2005). In this case, the premium price is designed as a PES.

We have a PES 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 complements (Milder *et al*., 2010).

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

The role of private sector in developing PES in favor of landscape beauties 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 complements and environment could be not only private tour operators, individual or associated, but also entrepreneurs in specific activities, hunters, fishermen and tourists. Among them it is important to focus attention on those engaged in sustainable tourism activities with regard to environmental resources, such as eco-tourists (FAO, 2007).

The ecosystem services provided by landscape are suitable for a synergistic provision, i.e. they facilitate the creation of an aggregate PES, where users can combine their payments. At the same time the ecosystem services provided by landscape depend on cooperation among farmers. In fact, only if a sufficient number of them act to protect rural scenic beauties it is possible to achieve a high quality level landscape (Goldman *et al*., 2007).

Then 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 the definition proposed by FAO (2007) comprehending the green premium price of a product, an interesting opportunity for the ecosystem services provided by rural landscape beauties 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 allow us to take into account the widest range of ecosystem services attributable to a specific landscape and the aspects that are not evaluated (Huberman and Shepherd, 2010). In this context, the idea of expanding the scope of PES schemes by creating some "landscape labels" (Ghazoul *et al*., 2009) in order to label all goods and services originating from a specific area/landscape should allow the inclusion of all those ecosystem services that arouse less interest owing to the difficulties of their identification and quantification (i.e. cultural services). Nevertheless, it is important to be aware about the

confusion deriving from the presence of a multitude of labels and the adverse effects, both in economic and environmental terms.

In favor of this type of PES for rural landscape 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 certificated agricultural products (Forest Trends and The Ecosystem Marketplace, 2008).

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

A considerable positive effect of PES that provides or maintains the landscape beauties is the rise in the value of local resources, especially real estate. In fact, they can enjoy better landscape and undergo a process of appreciation, estimated through appropriate estimation methodology: the hedonic price method (Rosen, 1974).

On one hand, PES scheme in favor of landscape beauties seems to have significant positive consequences, especially in some landscape contexts, as the Italian one. On the other hand, consistent are also the difficulties encountered in their implementation. An example of this situation is the impossibility that occurs in certain situations to separate the ownership of the ecosystem services from the landscape one. This problem does not allow the creation of a market.

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

These difficulties are partially overcome if the rights to control access to landscaper are placed in the hands of local communities. The same reason applies to the right to weave agreements with the users in order to secure the payment of a fee to guarantee the possibility of fruition.

The potential role of co-operative approaches is strategic in particular when it supports the implementation of PES for the landscape. 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 to obtain ecosystem services.

Cooperation may be a mode of coordination 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 that accompany the implementation of PES schemes.

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

The development of a PES in favor of the landscape needs the creation of synergy among different activities. Conservation of rural landscape and environmental resources, ecotourism, production of quality goods, marketing are some of the activities that must act in harmony (Robinson and Keenan, 2010).

In summary then, PES scheme is part of a diverse set of tools aimed at the conservation and improvement of the landscape ecosystem services (Table 2). On the one hand there is the traditional institutional intervention that requires the preservation of a scenic resource through instruments such Command and Control approaches. The creation of parks and protected areas is an example of application of this system, which draws on public funds, or funds rose through entrance fees, permits, etc. Similarly, the actions of urban planning are part of this mode of intervention.

On the other hand, we identify cases in which the market encourages the conservation of the landscape. In particular, it happens on the real estate market that appreciates the assets near an attractive landscape, as demonstrated by hedonic pricing method. Also the conservation of the provision of ecosystem services based on purchasing or renting of land passes through the market using an ordinary transaction.

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

Table 2: Tools in favor of the conservation of landscape beauties

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

Some authors propose to create appropriate conditions for conducting private transactions through collective approaches, cooperation in finding a useful tool for landscape management (Farley and Costanza, 2010).

A market in favor of the landscape can be realized even on philanthropic foundations that try to materialize the willingness of private individuals to pay to the landscape. In this case it is necessary a public awareness towards environmental problems that seems to be still lacking. It should also be considered that donations generally do not respect the character of conditionality and not require an exact definition of the ecosystem service (Robertson and Wunder, 2005).

An innovative market in favor of the landscape is that created by the aid of Internet: i.e. the case of the site EcologyFund.com, in which users are given the option of "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 by the sponsors of the site.

In this framework it seems that PES could play an important role in managing and conserving landscape and environmental resources (UNECE, 2007; Waage, 2007). Although they need to be supported by the work of specific organizations and made by implementing appropriate flexible schemes (Landell-Mills and Porras, 2002), they seem to offer interesting opportunities.

PES 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 scheme.

6. PAYMENTS FOR LANDSCAPE BEAUTY IN ITALY

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

To try to assess the opportunities in implementing PES schemes in the Italian context it seems to be interesting the results obtained from the above mentioned studies carried out in order to identify the preferences of citizens for landscape and environmental complements and define a monetary estimate of them.

These data and the results of further more recently studies conducted in other Italian areas (Bossi Fedrigotti *et al.*, 2011; Tempesta and Thiene, 2006) allowed us to estimate that the preservation of the rural landscape will produce benefits for the community that are 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 the ecosystem services deriving from the landscape produce considerable benefits to citizens. Therefore, in Italy there is the opportunity to develop some PES schemes in favor of the rural landscape resources.

The data point out the significant opportunities for the realization of these schemes in Italy. In fact, the benefits received by the community from the conservation and enhancement of

the landscape seem to be high. In particular, it seems desirable to develop PES schemes in different Italian rural areas in accordance with the preferences expressed by respondents in favor of specific landscape complements and their benefits.

On the basis of the importance of tourism in Italy and the importance of tourism linked to nature, the idea of using this tool in support of tourism could play a significant role in developing socio-economic systems and conserving landscape and environmental resources. In fact, "green" tourism, i.e. the one linked to the landscape and environmental resources, is experiencing positive trends, in contrast with other tourism businesses (Ecotur, 2011). The increasing number of green-tourists in Italy shows the desire to spend leisure time in contact with the landscape and environmental resources. This seems to be a viable opportunity for developing PES, in which tour operators or users of the same resources can act as buyers of the ecosystem services provided by the managers of these resources.

Moreover PES may be a useful tool to make explicit the costs and benefits associated with the use of portions of the soil and landscape for the production of renewable energy sources. There is a heated debate on the opportunities for land use in Italy in favor of the installation of wind turbines or photovoltaic. The realization of PES in this area could be a solution to balance the needs of the various stakeholders, such as, for example, on the one hand the desire to obtain the benefits in the form of integration of the income of land managers and minor environmental impacts (quality of air, water, etc.), on the other hand, costs related to the inclusion in the landscape of extraneous complements and the possible negative impact on the activities related to the landscape.

The use of PES does not exclude the presence of other tools (Engel *et al.*, 2008). In particular, considering PES features it is possible to state that it could not be considered the most suitable approach in any field and to achieve any goal. In fact, the choice of the best instrument depends on the characteristics of the ecosystem service, considering also the degree of conjunction between the ecosystem service and other benefits provided by landscape.

Of the highest importance is also the consistency of the scheme with the existing institutional framework.

7. WHICH ROLE FOR PUBLIC POLICY?

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

The public intervention in favor of PES diffusion can occur with several degrees of engagement. In fact, on one hand we can have the traditional role of institutional decision maker, on the other hand the government can act as an intermediary, a promoter/financier of PES, but also a seller of ecosystem services. The latter is the case in which the government has

the properties 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 be present in a PES scheme in order to remove barriers that may 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 realization. Among these, significant is the presence of high transaction costs related to the implementation of a PES scheme and the relative negotiating agreements. These costs are often due to the presence of supply and demand composed by individual economic agents. The key issue is the role that the government can play by bringing together buyers and sellers or stimulating the market mechanism by providing appropriate information, training and awareness in the community (Gutman, 2007). Moreover the institutional task is to increase public awareness about the benefits received by the sustainable use of landscape and environmental resources, inviting them to ensure their protection, through the payment of a price for the benefit they receive.

Furthermore, the government has to guarantee to the citizens the right to enjoy the essential ecosystem services, even when they have not the necessary financial resources to pay their delivery. It is important they do not look to the ecosystem services as luxury goods. In this case the government has to intervene directly financing the creation of a PES.

There are several examples of PES with the presence of government as a buyer. The mainly example is the European Union context is the agri-environmental payment, contained into the Rural Development Programme.

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

Public-financed PES is often uniform payment in favor of ecosystem services providers. It is characterized by low spatial differentiation and lack of specific targets. Moreover Pagiola and Platais (2007) showed that often in public-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 to observe the level of provision of ecosystem service that leads to adopt 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, sometimes public-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, the citizens are not stimulated to develop private transactions.

Nevertheless, public-financed PES has the opportunity to realize scale economies for transaction costs, given the considerable breadth of action that characterizes this type of scheme.

Although less efficient, there are some cases in which public-financed PES remains the only option: for example, when there is a significant conflict of interest between beneficiaries

and providers of ecosystem service or an increase in transaction costs or increasing incentives for opportunistic user behaviour (Wunder *et al*., 2008).

Public-financed PES is sometimes able to achieve objectives that a user-financed PES is not able to obtain. For example, the reduction of poverty in developing countries through the development of public-financed PES, which is intended mainly to improve 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 on one hand could confirm the importance of institutional support to ensure to the local population a certain level of quality of life, on the other hand 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 further targets.

8. CONCLUDING REMARKS

There are still some relevant difficulties to solve in order to be able to develop optimal patterns of PES in favor of rural landscape. First of all, the difficulties in estimating the value of the ecosystem service and in its price, identifying the best type of contract to ensure optimal deployment from a social perspective, but also the need to undertake an evaluation of the consequences arising from the application of a PES. The valuation needs the ability to make appropriate use of indicators and a sufficiently large period of time to observe and determine the impact of PES on the landscape and its complements (Marangon *et al*., 2007).

Nevertheless, the positive effects that seem to come from a suitable use of PES for landscape argue in favor of its extensive future use, according to 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 best instrumentation must take place according to the characteristics of the ecosystem service in question.

Each tool mentioned above could be the right one to maintain or increase the supply of ecosystem services provided by the rural landscape. Moreover the choice of one does not preclude the use of the others: in fact, each context and ecosystem services require an appropriate solution (Troiano and Marangon, 2011).

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