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Evaluation of payment for ecosystem services in Mediterranean forest: An empirical survey

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ABSTRACT

The relationship between humans and the forest has always been an important element, sometimes characterizing in the history of man himself. During the last years, the socio-economic context is profoundly changed, diversifying economic services provided by the forest. In the past, in fact, the primary function of the forest was the firewood production, while nowadays it grants several socio-economic benefits such as climate change mitigation, soil protection, protection and conservation of biodiversity, landscaping and recreational value. So, in recent decades a new type of socio-economic interest was developed in order to create a market of goods and services for the forests, called as payments for ecosystem services (PES). This paper, through a survey conducted in a wooded area of Sicily where recently was established a typical example of PES (Ecocampus), aimed at determining the actual satisfaction by users of the various services provided by forest, the reasons that lead them to visit it and their willingness to pay.

1. Introduction

Forests contain many habitats for plants, animals and microorganisms, which help to preserve the stability of the environment in terms of biodiversity (Fedrowitz et al., 2014; Marshalek et al., 2014), also playing a key role in mitigating climate change through the capture and storage of carbon (Ximenes et al., 2012; Klein et al., 2013; Liu and Yin, 2012).

Forests are considered a major asset for the socio-economic growth of rural areas, but often environmental protection has been pushed aside for tourism development, determining huge impacts on ecosystems, influencing their ability to generate services and externalities (Sukhdev et al., 2014). Therefore, a new forest management is considered necessary, in order to reconcile its several functions.

The ability of forests to produce several goods and services, many of them are externalities, in addition to wood biomass is fully recognized (Deal et al., 2012).

In recent decades, environmental economics was interested in developing a particular type of mechanisms in order to create a new market for goods and services (Bennett and Gosnell, 2015), denominated payments for ecosystem services (PES).

According to the latest available data (SIAN, 2015), the Italian forest area in amounted to 10.9 million hectares, showing in the last decade an increase of 600,000 ha (+6.1%). The highest increase of forest area was in the central and southern Italian regions, above all in Molise (+16.5%) and Sicily (+13.2%) (Fig. 1).

The most representative species in the Italian forests are spruce, larch, white fir, Scots pine, beech, chestnut tree, oak, Turkey oak, black hornbeam, Holm oaks, Cork oak, the Maritime pine and Aleppo pine (Ubaldi, 2008).

So, this paper through an empirical survey conducted in a wooded area of Sicily where recently was established a typical example of PES (Casaboli Ecocampus), aimed at determining the actual satisfaction by users of the various services provided by forest, the reasons that lead them to visit it and their willingness to pay.

2. Payments for environmental services

Human welfare depends on ecosystems and the benefits they provide (Costanza et al., 1997) but, in recent decades, human activities have had enormous impacts on the environment by influencing the evolution of ecosystems and the their ability to deliver services and externalities (Kull et al., 2015).

Externalities related to forest resources play an increasingly important role in forest economy, as a natural consequence of the growing gap between the demand for public goods (water

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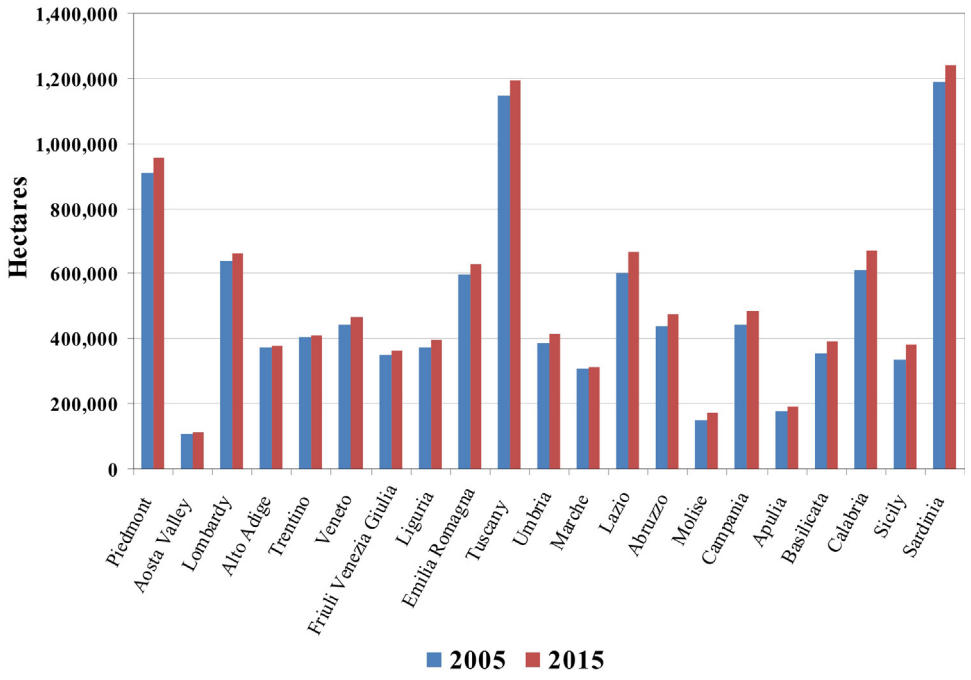

Fig. 1. Evolution of forest area in Italy.

availability, air quality, protection of the landscape and biodiversity) and supply of goods and services provided by forests.

The cultural growth and increase of environmental sensibility by the community highlighted more and more the role of forest ecosystems, including those of urban and peri-urban sector as public goods (Lanfranchi et al., 2015). This involves a growing trend of users, with an increase in the complexity of management aimed at enhancing the forest multifunctionality and with the recognition of new ethical and socio-economic values, all within a framework that ensures its sustainable development (Lanfranchi and Giannetto, 2014; Tomao et al., 2013).

The Ecosystem Services (ES) are defined as the benefits that result directly or indirectly from ecosystems (MEA, 2005). The agriculture, and more generally, the agro-forestry territory, plays a complex role in respect of ES. In fact, if on one hand the agricultural production processes using the ES generated from the surrounding area, on the other hand, agriculture can provide ES to society.

Biophysical quantification and monetary evaluation of services allows, in addition to assessing the environmental costs associated with changes of agro-ecosystems (land-use changes, technological innovations), to define and plan properly the public intervention and particularly the agricultural and environmental policies for the conservation of biodiversity (Vatn, 2015).

Several studies (Srinivasan, 2015; Di Trapani et al., 2014) have analyzed the possibility of adopting new tools based on the creation of markets for specific goods and services in order to increase the attractiveness of forest, the so-called payment for environmental services (PES).

The potential impacts of payments for environmental services (PES) on environmental outcomes and local livelihoods in several countries are numerous and have been widely debated (Clements and Milner-Gulland, 2015).

PES represents new ways of moving from land degradation toward sustainable land management through the development of economic mechanisms (Reed et al., 2015).

PES, in fact, are tools created to correct "market failures" related to traditional modalities of environmental goods and services supply, stimulating the production of positive environmental externalities and transforming them into real products sold on the market (Friess et al., 2015; Vidale et al., 2012).

Wunder (2005) defines PES as "voluntary transaction that a good defined ES is purchased by a buyer who receives it from a supplier of ES on condition that the supplier will ensure the supply of ES" because you create contacts for PES. According to Wunder, in order to create contact between suppliers and buyers, five conditions must be observed:

(1) the identification of an environmental service to be exchanged in the market;
(2) the presence of at least one buyer;
(3) the presence of at least one seller;
(4) the intent between the parties to commercialize an environmental service;
(5) the conditionality of the payment, according to which the producer is obliged to be actively involved to ensure the environmental service over the years.

The creation of PES comes from the need to improve efficacy, efficiency and distributive equity in the production of a particular environmental service compared to a reference base (Wegner, 2015).

In a global context of stagnating or even decreasing public funding for biodiversity conservation, PES have the potential both to raise some new funds, and to absorb more efficiently money previously spent otherwise (Wunder and Wertz-Kanounnikoff, 2009).

PES schemes rely on payments to induce behavioral change, thus they can be considered part of the group of incentive- or market-based instruments for environmental policy (Troiano and Marangon, 2010).

Moreover, the alleged capacity of Payment for Environmental Services (PES) to reach conservation policy goals, while reducing poverty in a cost-effective manner, makes it an extremely attractive development instrument for policymakers (Rodríguez de Francisco and Boelens, 2015).

As regards the payment strategies of PES, they are voluntary contractual agreements, environmental permissions, direct payments to managers by users/clients or public entities, incentives and/or