

## Perspective Essay

# Rural landscape, nature conservation and culture: Some notes on research trends and management approaches from a (southern) European perspective

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## H I G H L I G H T S

- Historical landscapes are important.
- Nature conservation is discussed.
- Protected areas do not protect landscape.
- International directives.

## A R T I C L E I N F O

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## A B S T R A C T

There is a growing interest today in landscape as an important perspective in sustainable development. A landscape perspective is being promoted at the global level by all of the most important institutions and through important regional directives and policies. The opportunities presented by a landscape-based approach for the European continent mark out the landscape as a possible new paradigm for our development model, with the aim of harmonious integration of social, economic and environmental factors in space and time. Current socio-economic trends, favoring abandonment and industrialization and conservation policies, supporting and promoting renaturalization, are threatening the loss of critical heritage resources. However, while socio-economic trends are difficult to change, more attention should be placed in conservation strategies. The rural landscape is largely a historical product and the time has come to assess it accordingly, identifying not only its threats and criticalities, but also challenging the policy directives and research approaches developed in recent decades that are negatively affecting the conservation and management of values associated with it. At the policy level, international directives dealing with have reinforced the trend toward cultural globalization by often overlapping the idea of nature with that of landscape, encouraging renaturalization, particularly in the form of forest cover, and neglecting ancient landscape patterns and the long and rich cultural history that led to their creation. It is important to encourage the recognition of a different level of biodiversity, biocultural diversity, looking for examples of positive integration between society and environment occurring in the rural landscape.

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## 1. Introduction

There is currently a growing interest in landscapes as an important perspective in sustainable development, and it is being promoted at the global level by important institutions, such as

UNESCO, FAO, CBD, and IUCN,<sup>1</sup> and through important regional directives and policies, such as the European Landscape Convention and European Common Agricultural Policies (CAP) 2014–2020. A landscape-based approach for the European continent presents landscapes as a possible new paradigm for a developmental model that would harmoniously integrate social, economic, and environmental factors in space and time.

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<sup>1</sup> United Nations Educational, Scientific, and Cultural Organization (UNESCO); Food and Agriculture Organization of the United Nations (FAO); Convention on Biodiversity (CBD); International Union for Conservation of Nature (IUCN).

Landscape is largely a cultural construct and exists in a state conceived of or to a certain extent “planned” by human beings in consideration of its natural components. However, current strategies and actions applied to the planning and management of landscape resources, as well as the scientific literature supporting landscapes, suggest that more work is required. Although this concern is global, the need to promote and implement conservation and valorization of cultural features of the rural landscape is particularly important in Europe. The current socio-economic trends that favor abandonment, industrialization and conservation policies and support and promote renaturalization are threatening the loss of critical heritage resources. Although these trends are difficult to change, more attention must be given to heritage conservation strategies.

## 2. The European rural landscape

The cultural nature of rural European landscapes and their historical roots have been previously described in studies conducted by this author and other recognized scholars (Agnoletti, 2012; Antrop, 1997; Parrotta & Troster, 2011; Rackham, 1986). The continent boasts a rich heritage of rural landscapes built up over thousands of years; landscapes that continue to evolve while retaining evidence of their historical origin, albeit with different degrees of integrity, and maintaining active roles in society and the economy. Landscapes classified as rural comprise 95% of the territory of the EU. Furthermore, 66% of the EU population lives in rural areas, generating 45% of the gross value of the EU and providing 53% of its employment, whereas agriculture and forestry account for 77% of land use.

According to Carl Sauer (1925), “a cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent, the natural area the medium, the cultural landscapes the result” (p. 343). In 1961, the agrarian historian Emilio Sereni wrote: “the agrarian landscape is the form that man, in the course and for the ends of his agricultural productive activities, impresses on the natural landscape” (Sereni, 1997, p. 33). Considering only these definitions among the many existing definitions, we might conclude that most of the European landscape, especially in the Mediterranean basin and in many densely populated areas, has a cultural origin that is indissolubly tied to farming, forestry and grazing practices (Grove & Rackham, 2001). In this respect, these practices can remain active or be interrupted but the resulting type of environment has always a cultural origin.

The many ways in which humans have shaped the natural landscape over the centuries have also produced some of the most representative manifestations of diverse cultural identities on the European continent (Pitte, 1994). A complex set of ingenious and diversified techniques has fundamentally contributed to the survival of the population and construction and conservation of the historical, cultural and natural heritage. These techniques were a means of continuously adapting to difficult and changing environmental conditions to provide multiple goods and services that improved the standard of living and gave rise to landscapes of great beauty. On par with other evidence of the past, the landscape is a repository of cultural values, the importance of which must be assessed from an environmental perspective. What distinguishes the complexity of the historical character of landscapes is the multiplicity and stratification of footprints left by so many distinct civilizations. Over the course of time, settlement and activity provide a wealth of diversity in the form of new plant species, cultivation techniques, plantations and methods of land delimitation, water collection and use, and buildings and terrain structures imbuing the historical character of each region of Europe with special and unique values. We must also note that landscapes, merging

in an original synthesis the beauty of a place with its historical character and diverse habitats, are also documents of past civilizations that are admirable as esthetic works and representations of the genius of their builders. For these reasons, landscape heritage is a fundamental resource that must be safeguarded. It should also be remembered that, in contemporary society, landscapes can have values that extend beyond the interests of the immediate social group that contributed to their present configuration because of, in some contexts, their broader worth as public goods at regional, national and global levels.

If the rural landscape is such a historical product, then the time has come to assess it accordingly by identifying its threats and criticalities and challenging the policy directives and research approaches developed in recent decades that are negatively affecting the conservation and management of values associated with landscapes. At the policy level, international directives involving landscapes have resulted in outcomes within legal and administrative spheres that deeply affect the ways in which administrators manage landscapes and the broader public perception of landscapes. These directives have reinforced the trend toward cultural globalization by often overlapping the idea of nature with that of landscape, encouraging renaturalization, particularly in the form of forest cover, and neglecting ancient landscape patterns and the long and rich cultural history that led to their creation.

In turn, there has been a growing tendency favoring the scientific study of landscapes more as a natural resource than as a cultural phenomenon. One of the reasons for this is the lack of a more diversified approach to research activity. Most of the EU projects dedicated to landscape are incorporated into environmental research that has objectives and methodologies that focus on a narrow ecological point of view, with little attention given to its cultural aspects or to the knowledge gained through the humanities and social sciences. While historical ecologists have been aware of the inadequacies of such a one-sided approach for more than a decade (Balée, 1998), this scientific discipline, even in recent workshops, has done nothing more than acknowledge that the problem exists. This disparity has also recently been recognized at a high scientific level by the European Science Foundation’s COST RESCUE<sup>2</sup> initiative, which stressed the need for change (Holm et al., 2013). The reduced importance of the humanities has also been addressed during a meeting in September 2013 organized in Vilnius by the Lithuanian presidency of the EU, which produced the “Vilnius Declaration” that stressed the appropriate inclusion of social sciences and humanities in the new EU research funding program, Horizon 2020.

Publications focused on landscape studies further exacerbate the problem. Even journals such as this one, which are dedicated to planning or management as opposed to ecology or biology, mostly appear to consider landscape from an ecological point of view and in the context of nature conservation. In terms of the production of and value placed on knowledge, papers published in scientific journals are distributed among researchers in disciplinary fields, and the productivity of scientists is largely evaluated by the quality and number of papers they publish. Conversely, books and book chapters that tend to provide both a broader and deeper perspective on research matters often garner little career recognition and are mostly distributed among those in the humanities. This difference also tends to bias the value of knowledge toward an ecological or environmental approach to landscape studies.

These trends in policy, theory, and scholarly communication have had important practical side effects, of which three are particularly problematic: assessing landscape degradation, interpreting

<sup>2</sup> European Cooperation in Science and Technology (COST); Responses to Environmental and Societal Challenges for our Unstable Earth (RESCUE).

processes such as the current abandonment of farmland in EU countries, and measuring biodiversity in the landscape. After discussing each of these critical problems, I will suggest ways in which we might work toward greater recognition and action to conserve Europe's cultural landscapes.

### 3. Degradation of the rural landscape

The negative assessment generally associated with farming, forestry and grazing has been largely developed in the context of modern agriculture. The speed and extension of technological, cultural, and economic changes that have occurred in recent decades are threatening not only the environment but also the landscapes and rural societies associated with them (Agnoletti, 2006; Antrop, 2006). Multiple pressures that constrain farmers' innovation and often lead to unsustainable practices include resource depletion, productivity decline, and excessive specialization, all of which place the preservation of landscapes as an economic, cultural and environmental resource in serious jeopardy. The industrialization of agriculture has also degraded traditional landscape mosaics and the historical biodiversity associated with them. The result is an interruption in the transmission of traditional knowledge required for local landscape maintenance that produces socioeconomic destabilization of rural areas and a loss of the competitiveness of agriculture in contrast to other economic sectors. The introduced agricultural systems have moved in opposite directions. In areas most conducive to cultivation that uses technology for industrial-scale farming, the land has been subject to intensified and simplified production, and economically efficient agrosystems have been developed that are adapted to the globalized market and depend on outside energy resources. This approach has proven fragile from an ecological perspective and is often environmentally harmful. However, in areas that are not conducive to simplified and intensive crop production, a marginalization process has long been underway that has resulted in the abandonment of rural settlements and activity (Agnoletti, 2012).

The loss of connection between crop production and animal use has further simplified these monocultural systems. Animals no longer have any function (e.g., as working animals, for the recycling of crop residues, or for the production of organic fertilizer) and are no longer found in the type of agriculture made up of autonomous production units, further resulting in a decline in landscape diversity. Emphasis on increased productivity has thus impoverished the landscape without providing a model that has advantages over the many alternative types of agriculture traditionally used across Europe. Arguably, European agriculture has imported cropping systems typical of other parts of the world, such as the monoculture landscapes of North American cereal farming, without turning the identifying characteristics of European landscapes into competitive assets.

Forest landscapes have also changed their features in many areas, which are now characterized by large expanses of coniferous monocultures instead of broad-leaved trees, which is a result of the approaches promoted by forestry sciences at the beginning of the 19th century (Johann et al., 2004). Thus, what we are witnessing today is a reduction in the once wide variety of traditional forest management systems (such as woodland adapted to cattle grazing and fruit production for human consumption) and a decline of wooded meadows, shrub land, woods for the production of forage, coppicing, resin harvesting, and many other woodland systems closely connected with farming activities. Many cultural forests, such as chestnut orchards, have been similarly abandoned and turned into mixed stands; this practice, similar to the interruption of grazing, has often been supported by nature conservation

strategies, especially in protected areas. Despite all of these problems, we cannot take these observations as a reality that affects the entire rural territory, nor can we consider abandonment and renaturalization as the best possible option.

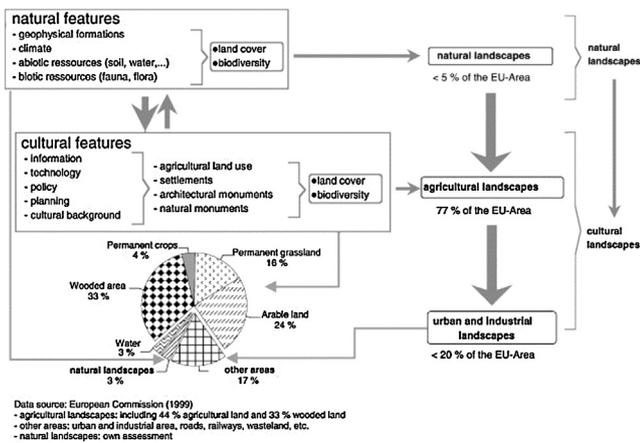
### 4. Abandonment and reforestation

Abandonment is a consequence of socio-economic changes connected to the globalization of agriculture and related demographic processes that moves rural populations to towns and cities and results in the neglect of traditional rural landscapes that are less suited to the development of industrial-scale farming. In many developed countries, this process has also been aided by agricultural policies that initially promoted set-aside programs to reduce surplus farm produce. These policies have encouraged the gradual abandonment of traditional farming systems, which are less important from economic and productive points of view but crucial as far as the landscape is concerned. In terms of surface area, woodlands are increasing across all areas abandoned by farming and sheep husbandry. According to the European Forest Action Plan, the rate of forest advance in western and central Europe is approximately 400,000–500,000 ha/year. Significant increases in forested areas since the end of the 19th century can be observed from Sweden to Italy (Agnoletti, 2012) and from western to eastern European countries, including the former Soviet Union, as a result of widespread farmland abandonment and substantial migrations away from rural areas (Ioffe, Nefedovab, & Zaslavskyc, 2004; Lerman, 1999; Mathijs & Swinnen, 1998).

Although part of the afforestation during the last two centuries is a result of the increase of conifers for productive purposes (Johann et al., 2004), the renaturalization process currently underway promotes the disappearance of open spaces and creates a homogeneous, less diverse land cover that is not only detrimental to the landscape but also to biodiversity in general and to specific aspects of it. Despite this evidence, current EU policies provide public money to member states to undertake further afforestation as if there was a scarcity of woodlands, and a large portion of the scientific community is supporting this process.

Abandonment is generated by social and economic changes but is also directly or indirectly supported by current scientific approaches and related environmental policies. Beginning in the second half of the 19th century, but especially in the last two decades of the 20th century, Europe adopted some of the world's most advanced legislation for environmental conservation. With the United Nations Conference on Environment and Development (UNCED), which was held in Rio de Janeiro in 1992, and its operational document "Agenda 21," most environmental strategies were translated into political action. Although Agenda 21 also focused its attention on traditional practices, agriculture and related landscapes, the leading strategies promoted by the majority of governmental and non-governmental organizations, as well as scientific institutions, were based on the concept of human-induced degradation of the environment and the need to recover a "natural state."

These concepts were also applied to landscape studies and principles of ecological planning and ecology, which had experienced their own development in Europe and North America and were now becoming similarly globalized with an emphasis on the conservation of natural resources (Ndubisi & Steiner, 2002). This was precipitated by the rich historical literature on the human degradation of natural environments that had roots in the second half of the 19th century, notably in George Perkins Marsh's seminal work *Man and Nature* (1867), which was written while he was living in Italy as the U.S. Ambassador. It is an interesting coincidence because the Italian rural landscape was created by humans modifying the



**Fig. 1.** Since 1999, Europe has recognized that rural landscapes are a cultural product, yet there is no specific protection for rural landscapes or historical rural landscapes. Although 5% of the EU area was indicated as natural in 1999, approximately 18% of the current territory is under nature protection.

natural environment at least since Roman times and has been celebrated by travelers of the European “Grand Tour” since the 15th century (Towner, 1985). However, beginning in the 20th century, but mostly after the Second World War, the tendency evolved to criticize rural landscapes in favor of natural ones, which can be considered one of the important cultural shifts occurring in the last century alongside the principal economic and cultural changes affecting the relationships between humans and nature in European and North American cultures.

Together with the creation of natural parks and reserves, these attitude changes and ecological planning initiatives have resulted in significant policies in Europe. Two examples include the Habitats Directive (1992) and the Natura 2000 network, which were aimed at establishing a network of protected areas across the continent, with an official list of protected species and natural habitats and strict management rules applied to the selected areas. The Habitats Directive also mentioned the importance of landscape and human activities in relation to biodiversity, but the emphasis was clearly on the conservation of natural habitats. Effects of this have been the application of an idea of “naturalness,” even to places that are not natural but must be managed according to this concept. On the European continent, the growth of protected area surface was 23% between 1996 and 2006 and corresponded to almost 18% of the territory of 39 countries (AA VV, 2008) (Fig. 1). This growth had little to do with the conservation of historical rural landscapes or the cultural values associated with them in terms of landscape mosaics and traditional rural practices, but rather the opposite. In Italy, an analysis of 120 sites classified as historical rural landscapes indicated that 60% are also partly included in protected areas and sites of the Natura 2000 network. In these areas, the assessment of vulnerability to the historical landscape showed that the most important threats are not urbanization or industrial agriculture but rather abandonment followed by reforestation (Agnoletti, 2012). However, it is very unlikely that 20% of the Italian territory currently included in the Natura 2000 network can be considered as having a natural origin; they are usually cultural landscapes most often managed according to a renaturalization perspective.

An interesting case is the Cinque Terre National Park, a beautiful historical terraced landscape lying along the coast of Liguria (Italy). The area is a UNESCO World Heritage site; however, it is also a Natura 2000 protected area, and several national restrictions for landscape and hydrogeological purposes have been enhanced. All of these forms of protection did not prevent the forestation



**Fig. 2.** The photo shows a pollarded beech tree in the Sant’Antonio Forest, Majella National Park (Italy). The forest was already protected by landscape restrictions in 1953, but the creation of the national park and its inclusion into the EU Nature 2000 network of protected areas has promoted an “integral conservation” of the area. For these reasons, grazing and pollarding to produce fodder have been prohibited, and the forest is slowly degrading, favoring the disappearance of these trees. Their shape is not natural, as most people have been led to believe, but rather is a cultural product.

of the abandoned dry stone terraces, and the current park management plan does not authorize the removal of the forests to restore the abandoned terraces, except in certain limited cases. The analysis of an environmental disaster from landslides caused by extensive rainstorms on October 25, 2011 showed that 90% of the landslides affecting the area happened on abandoned terraces that were covered by secondary successions of Scots Pine (*Pinus sylvestris*) and Mediterranean shrubs. In contrast, only 2% of the landslides occurred on terraces still being cultivated, leading to the conclusion that forest growth after abandonment exacerbated the hydrogeological risk, whereas the remaining actively managed terraces were resilient to the effects of the heavy rains (Agnoletti, Emanuelli, Maggiari, & Preti, 2012).

A similar example is the Sant’Antonio woods, a medieval wooded pasture with beech trees pollarded into impressive shapes over the centuries by grazing animals, inside Majella National Park in central Italy (Fig. 2). The park has not only defined it as an integral reserve, but the wood has been included in a Nature 2000 site, with grazing now forbidden, favoring the degradation of this historical landscape. This has generated conflicts with the local population and with scientists and institutions willing to restore the wood and grazing. Nevertheless, the situation as described above has been the standard policy for lands across Italy, making the country a hallmark case for a broader issue. Although its landscapes have cultural origins and the country spread agriculture across Europe since Roman times, Italy diligently applies the current natural science views with reduced attention to the cultural features of landscape and their proven role in long-term landscape sustainability. Protected areas, particularly those belonging to the EU Habitats Directive, are generally managed for reforestation and natural habitats, even in the case of historical forest landscapes whose features result from centuries of traditional practices. Although their activity is surely invaluable to prevent urbanization, these policies add up to the extension of forested areas across Italy, which have grown by 150% since 1920 at a speed of 75,000 ha/year, whereas the abandonment of agriculture has reduced the area of farmed land by 40% (Agnoletti, 2012).

This trend toward reforestation is perfectly aligned with nature conservation policies applied elsewhere in Italy and the EU. In contrast, restoration and management of the historical rural landscape,

which is conducted by the Ministry of Agriculture, Food and Forest Policies or private foundations such as the Italian Trust for the Environment (FAI) or the Benetton Foundation, is often neglected or viewed as out of alignment with dominant conservation goals. Thus, it is no surprise that research papers describe the abandonment of the Italian Apennines and doubling of forested area as a favorable phenomenon and the resulting degradation of the historical landscape and reduction of open spaces as a minor problem. There are obviously counterexamples of park management in Europe, such as the use of controlled fire in the Pyrenees National Park (France) to remove the forest vegetation invading the pastures and preserve the historical landscape, but these tend to be exceptions to the dominant trend (Puissant & Prodon, 2002).

Considering this momentum toward reforestation and renaturalization, the difficulty of considering culture and history as principal values is plausible, even in the candidatures of cultural landscapes for the UNESCO World Heritage List. The debate on the assessment of human and natural values is ongoing, particularly when considering the influence of the IUCN in the International Council on Monuments and Sites (ICOMOS) assessment procedures. Although it has been written that a paradigm shift started in 1990 from “fortress conservation,” which is based on the idea that humans can only damage nature, toward more holistic ecosystem and landscape approaches, the reality of many cultural landscape nominations and management systems still exhibit an emphasis on natural habitats in World Heritage List nominations (UNESCO World Heritage Committee, 2008).

Preserving the synergies between human and natural processes (Singer, 2007) cannot occur without adapting the concept of biodiversity as it is currently being used so that it considers the diversity of cultural landscapes. The recognition that humans and associated cultural diversity are integral components of ecosystems ([www.cbd.int/ecosystem](http://www.cbd.int/ecosystem)) has little meaning if there is no allowance for active conservation and restoration of historical rural landscapes. In other words, it is one thing to allow farmers to exist if they do not disturb the natural habitats but quite another to put farmers and their landscapes at the center of conservation strategies.

The issue of forests and their roles and management criteria is a good example of the difficult relationships between nature conservation and cultural values. In 1992, Europe developed a body with more than 35 member states called the “Ministerial Conference on the Protection of Forests in Europe” (MCPFE), which was given the task of implementing policies to safeguard forests. Over the last two decades, MCPFE (today called Forest Europe) has introduced many important political resolutions as well as the “Criteria and Indicators for Sustainable Forest Management” (SFM) applied by member states to their forests (MCPFE, 2003). The three pillars on which SFM is based are ecological values, economic values, and social and cultural values associated with forests. However, except for the initial declaration of the Vienna conference in 2002 introducing the concept of social and cultural values, no political resolutions have been developed to promote them (Fig. 3). This lack of policy action has occurred despite the work conducted by several scientists from organizations such as the World Bank, European Landscape Convention, the United Nations Forum on Forests and UNESCO to develop guidelines for introducing social and cultural values in SFM (Agnoletti, 2007; Emanuelli, et al., 2012; Agnoletti, Tredici, et al., 2012).

One of the reasons for the lack of action is the obvious difficulty of introducing this new concept without changing the existing criteria and indicators of SFM. As currently written, these indicators are almost incompatible with a cultural landscape perspective in that they encourage the conservation of large, dense, homogenous forest covers and their continuous expansion, whereas small-scale, heterogeneous patches that are typical of cultural landscapes are

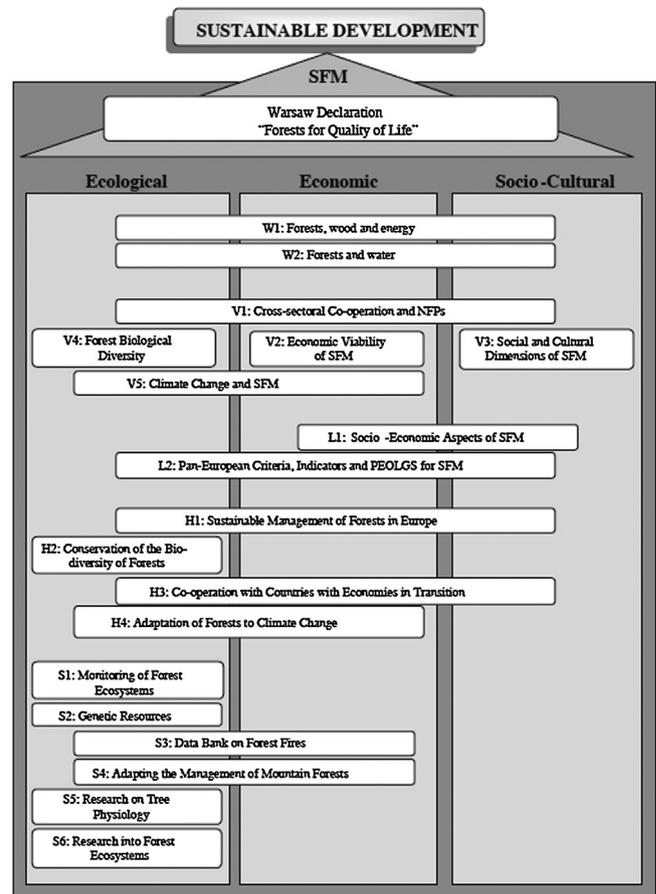


Fig. 3. The structure of Sustainable Forest Management (SFM) enhanced by the Ministerial Conference on the Protection of Forest in Europe identifies “social and cultural values” as the third pillar of sustainability. However, as shown, no specific resolutions have promoted cultural values.

considered dangers that fragment forest habitats. Cultural values in the existing criteria are relegated to single cases when identified as sacred sites, as if the cultural nature of a European forest could be reduced to a sacred site or the material heritage associated with forests.

A consequence of the above development is that a generation of foresters and research institutions has followed a narrow agenda to rebuild the landscape on a single pillar of the SFM criteria for sustainability. Presently, studies are showing a doubling of forest area, the demise of farmers and the open spaces they maintain through farming and grazing, and the invasion of wild ungulates and predators, which is described as positive and encouraged in forest management. In addition to the implications for biodiversity that will be discussed in the following section, such a viewpoint holds little regard for the historic landscape and related cultural identity of these areas. The high amount of forest in mountainous areas goes together with the rise of protected areas in this bioregion from the European average of 18–26%, but this often has little to do with natural attributes. In the case of the Alps, requirements for timber and grazing have strongly modified the natural features of the forests at least since the 15th century. In general, more than half of the protected areas are localized in rural territories and the European panorama of protected areas, which is unique in the world because such areas in Europe, unlike in North America or on other continents, are heavily marked by history and human action and all that this entails with regard to ecological, economic and cultural terms (AA VV, 2008).

A second consequence of the above is the application of these visions and strategies to rural areas through the European Common Agricultural Policy (CAP) (European Commission-COM, 2011). After an initial orientation to increase production and promote technological developments, the Mac Sherry reform of 1992 turned its attention toward environmental conservation in rural areas. The payment of subsidies within the ambits of CAP has since been directed toward actions to introduce more nature into the countryside, create new forests or otherwise make Europe more “green.”

Alongside technological and production standardization, a sort of nature standardization has become the cornerstone of action in many rural areas. In Pillar 1 of the new reform in the CAP 2014–2020, in addition to promoting more afforestation, landscapes have been placed in “ecological focus areas,” and the diversification typical of many landscape mosaics is considered because it improves soils and ecosystems and not for its contributions to the quality of the landscape or cultural identity. Nevertheless, in Pillar 2 of the new CAP, landscapes are described as an essential element of any effort to realize the growth potential and promote the sustainability of rural areas, and the need for restoring and preserving the overall state of the European landscape is also stated. This is more than what might be found in all of the previous EU agricultural policies and shows that the contacts between the European Landscape Convention and the Commission produced certain results, although not a Landscape Directive as occurred instead with the Habitat Directive. However, it can be argued that landscapes did not need to be placed into “ecological focus areas,” but instead should have been considered for what they are – a unifying concept that express the entire values of the rural territory.

Since the publication of the first reports of the International Panel on Climate Change (IPCC), even more effort has been placed on renaturalization and afforestation based on the worldwide concern for deforestation and climate change. Until the last IPCC report, this effort has often been performed while mostly ignoring the important roles that traditional rural landscape and practices serve: as key historical examples of climate change adaptation and mitigation. These roles have been rediscovered through important initiatives developed by the [International Union of Forestry Research Organizations \(IUFRO\)](#) in forestry research (Parrotta & Troster, 2011) and by the [FAO](#) for agriculture with its [Globally Important Agricultural Heritage Systems \(GIAHS\)](#) project. The conservation of these traditional and heritage systems has not always had a direct connection to the conservation of large natural forests as carbon sinks and efforts toward renaturalization may degrade their cultural features.

Finally, the agricultural abandonment and reforestation occurring in Europe have contributed to the increased importation of food with little consideration given to Europe’s growing ecological footprint because of the conversion and intensified use of land in other countries to counterbalance farmland reductions on the continent. For the past decade, Europe has doubled its imports to reach the equivalent of what 35% of “virtual agricultural land” would produce, making it the world’s single largest agricultural importer (Von Witzke & Noleppa, 2010). The ongoing debate as to whether land for nature and production should be segregated or integrated in the same area (Tscharrntke et al., 2012) clearly speaks in favor of a landscape perspective that integrates society, the economy and environment.

The application of these strategies not only affects the conservation of the rural landscape, but it also preserves people’s perception of the identity of places and changes that occur. However, while renaturalization occurring after the abandonment of the countryside is often perceived as a positive phenomenon by many EU citizens, there are important differences in perspective between people living in urban areas and working in agriculture,

with farmers usually expressing a negative view regarding such changes.

## 5. Rural landscape, history and biodiversity

Together with the importance of historical rural landscapes for hydrogeological stability (Agnoletti, 2007) and lower external energy inputs (Tello, Garrabou, & Cussò, 2006), one of the most crucial problems in a landscape approach with respect to nature conservation is biodiversity, and the biodiversity linked to the structure of a cultural landscape must be recognized. This is especially apparent when the historical dimension is explored directly in the field and the environmental systems and processes that shape each rural landscape are recognized as true functional nodes or “areas” in a more general historical process of “environmental biodiversification.” Under adequate conditions of efficiency, agrarian landscapes can play a direct role in the preservation of “agricultural biodiversity” (Wagner, Wildi, & Ewald, 2000).

What is less well-known is that by reconstructing the historical role of agricultural, silvicultural and zootechnic practices in local processes of biodiversification, we can mobilize an even vaster resource pool of rural landscapes of historical interest that could constitute a potential resource for providing new services in terms of biodiversity (Cevasco & Moreno, 2012). Many historical landscapes are currently degraded, and their productive efficiency is reduced because they have been deprived of their scenic qualities and are confined within local systems often regarded as economically marginal. Since the 1980s, scholars have recognized a curve of biodiversity in European agriculture, from a rise during the pre-historic and protohistoric phases of domestication, to a peak in the development of specialized European agricultural systems, and then a steep fall with the onset of industrial agriculture in the past century. In reconstructing the history of the management of genetic heritage, little attention has been devoted to the specific local environmental conditions under which biodiversification processes have occurred. This neglect is largely because of a still widespread notion of “landscape” based on the opposition of the “agricultural” to the “natural” landscape.

Thus, even in recent historical and archeological reconstructions, references can be found to the generally favorable climatic and environmental conditions of the great “diffusion centers” of cultivation biodiversity (a classical example is the “fertile crescent”) and to the general processes of “neolithization” or “agrarianization” that determined, according to the studies, the gradual acquisition of selected domestic species, as if the exchange, acquisition and loss of genetic heritage in local agricultures came to an end after this phase. Instead, it is known that the genetic history of domesticated plants has continued, with new local breeds and varieties selected and modified and others lost; this is one of the reasons why the identification of historical landscapes has great importance in the overarching theme of biodiversity (Cevasco & Moreno, 2012).

However, the concept of biodiversity should be adapted to the cultural nature of rural landscapes, which would reduce the current importance attributed to the habitat/species approach, which almost invariably concentrates on “alpha” diversity, and instead consider more innovative approaches, such as the concept of “biocultural diversity” as proposed by the joint program between CBD and UNESCO. Diversity at the landscape scale and interrelationships between humans and nature are most likely better standards for managing areas with a long history of human influence than standards developed for areas that have had little human influence. There are many studies showing the higher value of complex landscape mosaics, as opposed to simple forest habitat, created by farming practices and the positive role of fire in this process (Moreira & Russo, 2007). However, it is also necessary to develop

a different approach to biodiversity that expressly considers the “landscape level” to identify the complexity and fragmentation of many landscape mosaics not as a degradation or danger but rather as a positive feature in terms of biodiversity.

An example of a landscape level diversity assessment is found in a study developed to monitor landscapes changes in Tuscany over the last two centuries. The research surveyed 13 study areas using a multi-temporal methodology and showed that forestation was the most important process that occurred (Agnoletti, 2006). Tuscany is not a natural environment; however, more than 15% of the land is under nature protection, and forestation is viewed by the local authorities as a very positive factor for biodiversity. There has been a 55% increase in woodlands since 1832, which have occurred mostly on abandoned pastures and wood pastures (53%) and less often on cultivated land (20%). Woodlands have been extended in 10 study areas out of 13, and abandonment has been high in both the mountains and on hilly areas.

These trends are similar to those reported in several rural areas subjected to abandonment for comparable periods of time (Foster, 1992; Foster, Motzkin, & Slater, 1998), but in the case of Tuscany, measured changes in the landscape mosaic have been recorded. The most important evidence coming out of this study is the great loss of diversity in the landscape, with a decrease of land use linked to pastures and arable land of almost 48% between 1832 and 2004. Spatial biodiversity is a fundamental aspect in the quality of the landscape in Tuscany and other Mediterranean regions (Baudry & Baudry-Burel, 1982; Naveh, 1998). This reduction, which is related to the diversity of land use and number of landscape patches, is representative of reduced biological diversity because diverse landscapes are more species rich than individual habitat components.

The current decline in diversity reduces the diversity of regional landscapes to large subsystems inside main geographical areas and confirms the change from a fine-grained to a coarse-grained landscape that is already observed in other countries (Angelstam, 1997). However, considering the application of habitat theory in the management of protected areas and forests, the complexity of a landscape mosaic can be interpreted as habitat fragmentation and classified as a threat rather than a positive feature. This has been the main view in the past biodiversity plans of Tuscany and it is also currently supported by EU environmental strategies such as the Habitats Directive and SFM because it relates the danger of fragmentation to the survival of wildlife (EEA, 2011) and does not consider the conservation of a rich diversity of landscape patches as valuable. In this respect, the new online Italian Interpretation Manual of the 92/43/EEC Directives habitats (<http://vnr.unipg.it/habitat/>) confirms the above approaches, assigning primary responsibility of the national authorities to selecting habitats to protect.

This complexity is a typical feature of many traditional landscapes outside of Europe as well. Comparative research on the Telouet Valley in Morocco, Viñales Valley in Cuba and Itria Valley in southern Italy, the latter two of which are UNESCO World Heritage Sites and all three were farmed landscapes with high levels of historical persistence, showed that traditional farming practices created a highly complex landscape mosaic (Agnoletti, Tredici, & Santoro, 2012). The three areas display a prevalence of farmland over woodland and a relatively small average area of farmed plots: 0.48 ha for Viñales, 0.29 ha for Itria, and 0.09 ha for Telouet. The Moroccan site has the finest-grained landscape mesh because of the characteristics of its irrigated fields and historical farming practices. The number of land-use classes in which the respective land covers is divided is significantly different from one area to the other, with 12 land-use classes for Viñales, 18 for Telouet, and 36 for Itria. However, there are 2916 landscape patches in Itria, 2920 in Viñales and 3301 in Itria, and these patches have a high index of connectivity.

Complexity and historicity impart intrinsic value to rural landscapes, but this value is easily threatened by forestation because of abandonment. Forestation might create new habitats for certain species, but it also destroys the biodiversity resulting from species that only live on this farmed land and the compromised diversity of the landscape mosaic. If this level of biodiversity is not properly recognized, landscape degradation will continue not only from industrialization and urbanization but also from our failure as scientists and scholars to adopt a broader concept of biodiversity. It might not be problematic to apply the natural habitat view to certain areas of the world, such as large areas relatively untouched by humans. However, when such a perspective is applied to the entire world, especially in countries with a long history of human influence that has created a cultural landscape, it will result in an increasing impoverishment of the landscape as a source of meaning and value.

## 6. Conclusions

In view of the situation described in this paper and considering the lack of policies for the conservation of rural landscapes, it is important to view such landscapes for what they are, which means recognizing their cultural origins and managing rural landscapes to preserve their historical value. However, this requires the development of additional research to clarify the contribution of rural landscapes to the environment, economy and society, even though their importance has been indicated in previous research (e.g., Antrop, 2005). Europe has not yet adopted an adequate characterization of historical rural landscapes, though several experimental studies have been conducted that compare different areas in space and time. Unfortunately, also in the new EU Horizon 2020 research program (2014–2015) there is a reduced interest for this type of research; food security, sustainable agriculture, climate and environmental actions have no calls specifically considering landscape. There is a limited availability of funding and appropriate calls, especially those favoring interdisciplinary and transdisciplinary approaches combining the sciences and humanities, as previously mentioned. Despite these shortcomings, it is worth outlining an agenda for future work.

There is an urgent need to develop an inventory of the extension, characteristics, variety, and distribution of Europe's landscape, even if it is summary and exemplificative in nature. This inventory would provide a “living map” of the most significant articulations of cultural heritage to facilitate active protection and promotion. At the same time, such an inventory could inform citizens and policy makers and promote a higher degree of awareness and enjoyment of the multiple resources offered by rural landscapes. This in turn could lead to greater support for traditional agriculture, especially in inland hill and mountainous rural landscapes that still retain their historical value as hot spots of agricultural biodiversity and preservers of hydrogeological balance.

Research such as this could also serve as an important cultural bastion from which rural landscape conservation might be defended with more energy and civil rigor by combining nature with culture. Such research could also be the foundation for the identification, conservation and dynamic management of historical rural landscape, contribute to the implementation of the European Landscape Convention (ELC), provide a better definition of cultural landscapes for the UNESCO World Heritage Committee, and assist in the implementation of the FAO's Globally Important Agricultural Heritage Systems (GIAHS) project for the European region. The ELC requires identification and assessment to analyze landscape characteristics and the forces and pressures transforming them, observe changes, and assess the landscapes already identified to better account for their value.

Considering both the FAO GIAHS and a wider global perspective, encouraging the recognition of biocultural diversity, which is a different level of biodiversity, is important. With respect to the CBD-UNESCO joint program on the linkages between cultural and biological diversity, such an encouragement would shift the focus away from achieving a state of “natural” (or to trying to find it in unnatural environments) to examples of positive integration between society and the environment that are occurring in the rural landscape. In Europe, this would also provide new incentives for implementing the Common Agricultural Policy (CAP 2014–2020), which currently considers landscapes in the framework of “greening” or as part of “ecological focus areas” instead as cultural products that provide information on the nature of local heritage and reduce the risk of inappropriate strategies and actions. Furthermore, conservation of the cultural features of agricultural landscapes can add value to tourism and provide local and regional food products. The qualities of a rural landscape cannot be replicated by competitors as long as its uniqueness is maintained. Preserved rural landscapes also help maintain the quality of life for rural residents by providing viable communities and economies and the positive values associated such landscapes. In Europe, especially in the southern part of the continent, these values are deeply related to history and culture.

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