

Article

Rural Landscape Planning and Forest Management in Tuscany (Italy)

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Abstract: The article analyzes the relationships between landscape planning and forests in Italy with a specific focus on Tuscany. For the Tuscan region landscape represents a fundamental value from the cultural, economic, environmental and social point of view. This is why it was the first region of Italy to develop a landscape plan in 2014, according to the National Code for Cultural Heritage, setting up a Landscape Observatory to monitor the application of the plan in 2016. The plan is the main instrument providing a vision for the development model of the region and guidelines for the planning of rural areas also affecting forest management. The construction of the plan has caused an intense debate, due to the strict limitations imposed to soil consumption, to agricultural and forest activities. Forests cover more than the half of the regional surface, but 30% of them is the result of the abandonment of farmed land occurred in the last decades, while 50% of the forests are currently managed. The article examines how the values connected to the forests have been identified and assessed in the plan, the strict limitations for their protection but also the decision to allow the restoration of farmed land to maintain a balance between farmed and forest land in the landscape. Landscape and forest is the topic of the chapter about Italy in the FAO SOFO 2018.

Keywords: landscape planning; sustainable forest management; historical rural landscapes

1. Introduction

Despite its small size, the 72nd smallest country in the world, Italy has a large cultural heritage. More than 3400 historic towns, fine arts, architectural and archeological sites, museums, protected areas, more than 50 UNESCO sites and a variety of diverse landscapes distributed all over the country represent a fundamental asset influencing development strategies favoring several economic activities such as tourism. In 2015, 110 million domestic and international tourists (48%) visited the country, putting Italy in 4th place among tourist destinations. Tourism makes up 13% of gross domestic product (GDP) and accounts for 12.8% of employment. The agricultural landscape, including forests, farmed land, pasture and rural settlements, account for more than 70% of the territory, and its beauty has attracted foreign travelers since the 16th century [1,2]. Today the search for typical food alone represents 25% of the motivations of tourists traveling to the country and Italian food is known all over the world. The Mediterranean diet has also been included in the United Nations Educational, Scientific and Cultural Organization (UNESCO) list of immaterial heritage [3]). Italy can also be considered one of the best examples of the multi-functionality of the agricultural sector, incorporating a wide range of goods and services in the rural development model.

The importance of landscape as a fundamental element of modern Italy is demonstrated by the inclusion of landscape protection in the constitution of the Italian Republic written in 1947, soon after the Second World War and long before the European Landscape Convention was signed in Florence in 2000 [4]. Considering rural landscape, Italy introduced landscape among the strategic objectives of

National Strategic Plan for Rural Development 2007–2013, addressing its role as an added value for the rural economy, for the quality of the environment and for the quality of life of the population. Italy set up a national observatory for rural landscape and a national register of historical rural landscapes and traditional agricultural practices at the Ministry of Agriculture, as well as a national observatory for the quality of landscape based at the Ministry of Culture. Landscape quality has been officially included among indicators of the well-being of the population by the National Statistical Agency in 2014 [5].

In the national context, Tuscany has been chosen as the most important case study for landscape planning and forest management. The Tuscan landscape has become a symbol of the region all over the world, an expression of the values associated with the Italian lifestyle. The choice of Tuscany is also justified by the fact that the concept of a wise management of the territory, harmonizing economic, social and environmental processes, expressed by a fine-grained rural landscape cultivated as a garden, had developed already by the middle ages.

The Tuscan regional government considers landscape and territorial planning as strategic assets, so that Tuscany has been the first Italian region to develop a landscape plan (www.regione.toscana.it/-/piano-di-indirizzo-territoriale-con-valenza-di-piano-paesaggistico) according to the National Code for Cultural Heritage [6]. Landscape has been recognized as a fundamental resource for the economy of the region, but territorial planning has to deal with national laws, rural development, environmental protections, preservation of historical features and values. In this paper all of these instruments will be analyzed, showing how landscape and forests are considered in the official territorial planning of the region and in the national framework.

The objective of this paper is provide a review of how rural landscape and sustainable forest management are taken into consideration in official territorial planning in Tuscany (Italy) within the Italian context. Italy represent a case of a country where the quality of the landscape has played a fundamental role not only in the definition of cultural identity [7], but also for socio-economic development, especially in rural areas. This is also why the State of the Forest of the World 2018, produced by FAO, has included a chapter about forest and landscape planning in Italy.

2. The National Framework

2.1. National Planning Framework

At national level, forest planning can be mainly divided into two types of organization: a vertical logic (hierarchical mode from the national to the local level) and a horizontal logic (or intersectorial) ([8]. Often, not all the forest planning tools are consistent with each other, and there is a lack of true integration.

The document reporting the national strategies for the Italian forests is the National Framework Program for the Forests Sector (NFPFS) 2014–2020, a document implemented through the National Partnership Agreement, a document outlining the intended use of the funds in the pursuit of the EU 2020 targets (https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/europe-2020-strategy_en). These economic resources are spent through Operation Programs and Regional Rural Development Programs. The legislation concerning forests, according to the division of the roles between the state and the 20 Italian regions defined by the Italian constitution, is a multilevel and multisector discipline. Two distinct concepts of environmental multifunctionality and economic function of the forest have been included in the national and regional legislation [9]. The main legislative act is the forest law containing indications to prioritize silvicultural activities as the main tool for the socioeconomic development and environmental protection of Italian territory, as well as for the improvement and correct management of forest resources. The law allows the regional governments to develop stronger form of forest protection. The NFPFS proposed by the Italian Ministry for Agricultural, Food and Forestry Policies (MIPAAF) and by the Ministry of the Environment, with the final approval of the permanent conference between the state and regions,

defines strategic objectives for the national forest sector. These objectives are mainly oriented in favoring harmonization among regional forest policies for the execution of the international agreements signed by the Italian government. These strategies are achieved through different, national and regional, sectorial programs financed by the EU and the government, while at regional level the Regional Forest Programs are the main operational tool. As a general strategic objective, the NFPFS attempts to stimulate active sustainable forest management, with the aim of ensuring the multifunctionality of forest resources.

Forests are also included in the Common Agricultural Policy (CAP) objectives, defining three long-term strategic objectives for European Union (EU) rural development policy in the 2014–2020 period:

- Improving the competitiveness of agriculture;
- The sustainable management of natural resources and climate action;
- A balanced territorial development of rural areas.

For the purposes of managing rural development policy through Rural Development Programs (RDPs) these broad objectives are given more detailed expression through 6 priorities:

1. Fostering knowledge transfer in agriculture, forestry and rural areas;
2. Enhancing the competitiveness of all types of agriculture and enhancing farm viability;
3. Promoting food chain organization and risk-management in agriculture;
4. Restoring, preserving and enhancing ecosystems dependent on agriculture and forestry;
5. Promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in agriculture, food and forestry sectors;
6. Promoting social inclusion, poverty reduction and economic development in rural areas.

Forest are particularly important in the area of intervention n. 1 of priority n. 4, “Restoring and preserving biodiversity (including in NATURA 2000 areas and areas of High Nature Value farming) and the state of European landscapes”. Each regional RDP priority identifies specific areas of intervention (focus areas). RDP priorities and focus areas provide the basis for programming and rolling out the European Agricultural Fund for Rural Development (EAFRD) support to EU rural areas. Several EU funds provide additional support for rural areas alongside the EAFRD, namely: the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF) and the European Maritime and Fisheries Fund (EMFF). In order to deliver greater European added value and maximize synergies, in 2014–2020 all European Structural and Investments funds (ESI funds) concentrate their support on achieving the EU2020 headline targets and are coordinated under a Common Strategic Framework (CSF). The forest strategy is also enhanced through the EU Forest Strategy [10] and the Forest Action Plan (FAP), while the MCPFE (Pan-European Ministerial Conference on the Protection of Forests in Europe, now Forest Europe) has defined the criteria for Sustainable Forest Management for the European continent since the early 1990s [11].

Concerning nature protection, 7.6% of Italian forests are included in National Parks, 6.7% in regional parks, 1% in natural reserves, and 22.2% in the Nature 2000 network. Although many Italian forests are, therefore, included in the Natura 2000 network, local forest planning is not always coherent with Natura 2000 planning. Natura 2000 management plans have in fact limited effects on the management of specific forest activities, mainly because management measures are not clear, or are abstract concepts which are not translated into forestry practices [12], or because the final purpose of the two planning levels is different.

2.2. Ecosystem and Landscape Services

The Italian economy is the 8th largest by nominal GDP in the world and Italy is the second manufacturer of Europe. Services are the most important value-added sector, followed by industry and tourism, while agriculture and forestry represents 2.2%. Timber production plays a limited role in the forest economy. In fact, the combined effects of the geomorphological features, the quality of the forest species, and the structure of ownership, did not favor the development of a timber industry. The most valuable conifer forests are mostly situated in the north-eastern part of the country, but only 1/3 of the Italian forests are managed for production and the average size of the cutting plots is less than 1 hectare. Regarding ownership, 33% of the forest land is owned by the state, including common properties, while 66% is privately owned, but average size of private ownership is quite small, about 7 hectares. Also for this reason, although Italy has one of the most important furniture industries in the world, most of the timber is imported. In 2015, 10.7 million of m³ were imported, which makes up 80% of the needs of the country. Italy is also first in the world as a global importer of wood for energy use. Despite these limitations, the timber industry engages 420,400 workers, with 89,000 companies.

The European Landscape Convention has also been implemented by the MIPAAF, and landscape has been included in the agricultural policies since 2007, when it was indicated as one of the objectives of National Strategic Plan for Rural Development (NSPRD). This was the first time that landscape has been considered a strategic resource for rural development [13].

In 2009, a national scientific research program promoted by MIPAAF involving universities and institutions identified 123 areas characterized by significant historical rural landscapes associated to forests, pastures and farmed land and traditional production practices. These areas serve as important examples for rural development strategies, combining high-quality food, uniqueness of the landscape and attracting tourists. Following the results of this scientific research and of the introduction of landscapes in the NSPRD, MIPAAF itself established the Landscape Observatory of Rural Landscapes [14]. The observatory has the task to monitor landscape changes, develop a collaboration between landscape planning and rural development, define landscape quality objectives, develop international collaboration and manage the National Register of Historical Rural Landscapes and Traditional Agricultural Practices, which includes also forests having historical value [15]. The establishment of the observatory occurred after a decree of the president allowing the Ministry of Agriculture to develop landscape policies in the framework of rural development [16], recognizing the economic nature of the rural landscape and its contribution to rural development.

Thanks to the collaboration established with the observatory, in 2014 the National Statistical Agency [5] incorporated the quality of rural landscapes and the conservation of historical landscapes in the national indicators of the well-being of the population, a major step in recognizing the role that rural landscape plays for the quality of life in Italy. According to the need to maintain the diversity of the landscape mosaics and reduce the effects of abandonment, a modification of the landscape protection system was also introduced in 2012, allowing the restoration of previously cultivated areas, even if reforested after abandonment, and the restoration of forests having specific cultural features.

What has caused a lack of development of the national timber industry (geomorphological features, the quality of the forests species, and the structure of the ownership), has also contributed to the high level of biodiversity related to forests and to rural landscapes. According to the joint program between UNESCO and CBD (Convention on Biological Diversity) on the linkages between cultural and biological diversity [17] and to the Florence Declaration of 2014 [18], Italian and European rural landscapes are considered rich in biocultural diversity. This definition is also in line with the features of most of the Italian forests, according to third pillar of sustainable forest management in Europe, social and cultural values, introduced by MCPFE in 2002 and enhanced through specific guidelines in 2007 by the International Union of Forest Research Organizations [19].

Although some reports speak of natural forests when referring to woods resulting from regeneration that occurred in forests without visible signs of human intervention, from a scientific point of view there are only a few thousand hectares of natural forests in Italy. On the other hand, definitions

such as “natural” applied to forests having a cultural origin but evolving towards seminatural models is a widespread approach in Europe [20,21]. A similar situation concerns definitions such as “old growth”, recently appearing in some forest surveys; since Italian forests were extensively managed until the Second World War and, with few exceptions, they are usually not very old.

Extension, density, structure and species composition of forest have all been affected by human factors according to the processes originating cultural landscapes [22]. Coppicing is the most widespread management form, under the form of mixed coppice, simple coppice, simple coppice with mother trees, selective coppice; less common management forms are pollard trees, although widespread in the past. In the past few years there has been a tendency to reduce coppicing, both for the low cost of fuel wood compared to the cost of forest utilization and also for nature conservation strategies.

In terms of species the most widespread species are the broadleaved, mostly *Quercus* spp. (24.3%), followed by *Fagus sylvatica* (12%) and *Castanea sativa* (9.2%); among the conifers *Picea abies* makes up 6.8%, *Larix decidua* and *Pinus cembra* 4.4%, other *Pinus* spp. 5.3%. The woodlands classified as “other wooded land” in the national inventory of 2005 represent 16.3% of the total, mostly made of scrubland 58% largely distributed along the coasts and the islands. Most of the high forests are pure stands (68%); 13.5% are pure conifer stands, while 9.7% are mixed stands of conifers and broadleaved.

The limited extension of Italian forests (0.23% of the world’s forests) does not allow them to play an important role as carbon sinks, but for some qualitative features, such as biodiversity, landscape, history and cultural values they represent important values.

Regarding biodiversity, Italy is host to around 67,500 species of animals and plants, representing 43% of the total species described for Europe and around 4% of the species in the world. Approximately 35% of the species assessed by the European Red List of Species are present in Italy [23].

3. The Case of Tuscany

Tuscany is probably the best example of a region of Italy known all over the world for the quality of its landscape, and it is the first Italian region that has developed a landscape plan according to the National Code for Cultural Heritage, integrating urban and territorial planning with landscape planning.

Moreover, forests represent an important feature of the Tuscan landscape, since it is the second region of Italy for the extension of forests, covering about 53.4% of the regional territory [24]. Tuscany is the fifth Italian region in terms of extension; 67% of the territory is classified as hills, 25% as mountains, mostly in the Apennine range, and only 8% as plains. The regional territory is mostly classified as rural (93%), while the population (3,753,000 people—162 inh./km²) mainly lives in the cities and is mostly distributed along the Arno valley (70%). Despite the rural features, agriculture production has a minor role in GDP (1.8%), while services represent the most important part of the economy and tourism is about 7%; Tuscany is also the first region of Italy for agritourism (Figure 1). This an important resource for the rural economy witnessing an impressive increase during the last decade compared to the other economic sectors (+367% between 1997–2012); farmhouses are the most preferred choice of the tourists traveling to Tuscany after five star hotels [25].

The attractiveness of the rural landscape is associated to the high quality of rural settlements and of local foods, and the market price of cultivated land in some areas is higher than the price of the land used for urban development. The variety of geographical conditions, the diversity of agriculture and forest activities, and the level of integrity of historical villages contribute to preserve a high-quality landscape.

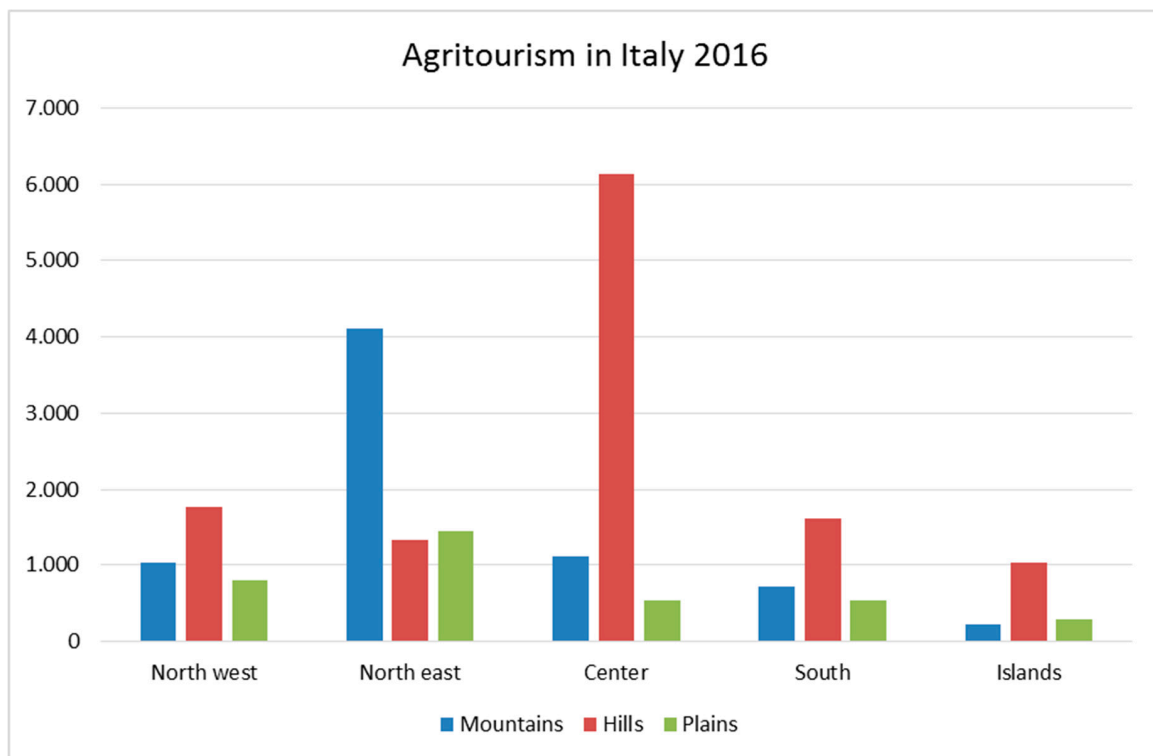


Figure 1. The distribution of agritourism in Italy shows a higher number in the central part of the country and on the mountains. These confirm that hilly areas and mountains, less developed than the plains but where we find most of the forests, have attractive landscapes. The small number of businesses in the south and the islands are mostly due to organizational problems of this sector, and these areas have usually a higher number of unique landscapes compared to the rest of the country.

3.1. The Landscape Plan of Tuscany

The landscape plan of Tuscany is an act required by the National Code for Cultural Heritage, that allows each region to develop a landscape plan independently from the ordinary territorial plans defined by urban planning, or to integrate them in one single plan. In the case of Tuscany, the regional council decided to integrate the two planning levels in one single act, the law n. 65 of 2015 “Norms for the Government of the Territory” [26]. The law aims at achieving sustainable development controlling the transformations induced by economic activities, fostering the maintenance, reuse, restoration and the creation of new landscapes. In the law, landscape capital has been considered a common good, recognizing equal rights to the citizens in terms of use and fruition, respecting their needs for a better quality of life for the present and future generations. Landscape capital is defined as the “whole set of structures resulting from the long-term coevolution between nature and human society and an important value for the future generations” [27]. An active conservation of landscape resources, together with the protection of the cultural and natural heritage of the region represent the general view of the plan.

From the legal point of view, the landscape plan prevails over all the other regional planning levels as they must take into account the rules indicated by the plan. This is an important difference in comparison with other parts of the world. It means that from minor things such as the architectural details of buildings (e.g., doors, windows etc.), to forest management (e.g., coppicing, clear cuts etc.), or major infrastructures (e.g., roads, railways etc.), everything is regulated and submitted to authorization procedures. The plan divides the regional territory in 20 landscape units (Figure 2), homogenous areas with common characteristics and objectives regarding landscape and environment.

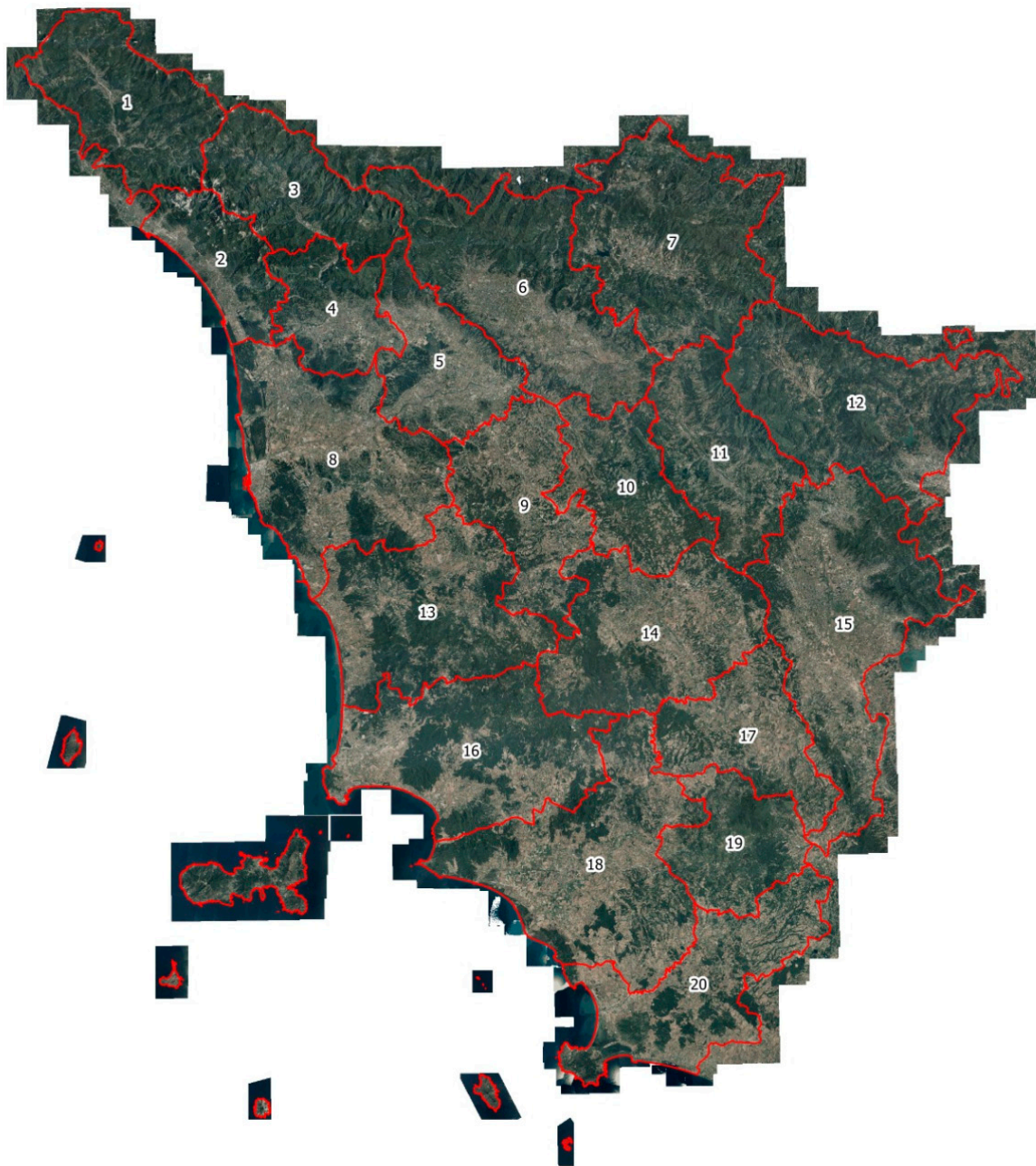


Figure 2. The 20 landscape units in which the territory of Tuscany has been divided according to the landscape plan. In the aerial photo forest areas are in dark green color. As it can be observed they are distributed all over the territory, especially on the Apennine mountains in the north, creating a complex landscape mosaic made of forest and agricultural patches.

Among the landscape quality objectives of the Tuscan landscape plan it is possible to find:

- The maintenance of the characteristics, constituting elements and morphologies, also taking into account architectonic typologies, as well as construction materials and techniques;
- The restoration and upgrading of the buildings and areas subject to protection which have been compromised or degraded, with the aim of recovering pre-existing values or of creating new landscape values that are consistent with and integral to the previous ones.

The plan includes a detailed survey of the entire land area through the analysis of its historical, natural and aesthetic characteristics and their inter-relationship, the definition of the landscape values to be protected, and an analysis of the dynamics of land transformation through the identification of risk factors and landscape vulnerability. Moreover, it provides the definition of general and operative prescriptions for protection and use of the land and the definition of measures for the conservation of the distinctive features. The specific objectives of the landscape plan are summarized in Table 1.

Table 1. The specific objectives of the landscape plan of Tuscany.

Represent and valorize the richness of the landscape resources, taking into account its long-term evolution and avoiding the risks of trivialization.	Address the features of settlements, valorizing the polycentric nature of settlements and the reuse of existing urban areas.
Ensure the integrated management of the structural elements of the landscape.	Ensure the positive coevolution between rural landscapes and agro-silvo-pastoral activities.
Ensure the coherence among geomorphology, localization, form and extension of settlements.	Ensure the role of landscape as a common good and the public fruition of all types of landscapes.
Promote the awareness of the importance of alluvial plains for the quality of the landscape and the environment where most of the urban areas are concentrated.	Improve the knowledge of the landscape, starting from the places described by the travelers of the Grand Tour since the 16th century, up to the landscapes along the road network crossing the region and around residential areas.
Recognize the contribution of natural and rural landscapes to biodiversity and improve the ecosystemic values of the territory.	Ensure that the transformation of the territory occurs according to appropriate knowledge and rules.

According to the national indications and to the aesthetic, ecological and structural approaches, the plan assumed as a central reference of its structure four “structural invariants”, fundamental values associated to Tuscany, that cannot be degraded (Figure 3). While the landscape units represent the local level of the plan, the four invariants represent the regional level:

1. The hydrogeomorphological features of morphogenetic systems and river basins: this is the fundamental physical structure on which the different identities of the Tuscan landscape developed.
2. The ecosystemic features of the landscape: this the invariant where the biotic structure supporting the animal and vegetal species, made of complex mosaics in the agricultural and forest matrix and the associated biodiversity. This is also the invariant where forests are described.
3. The polycentric and reticular features of urban, infrastructural and settlement systems: this invariant represent the prevailing structure of settlements inherited from Etruscan times (7th century B.C.) and maintained through the centuries.
4. The characters of the rural landscapes: this invariant identify the detailed features of the land-use mosaic and agricultural cultivation affecting the quality and biodiversity of rural territory. The description includes the relationships with the settlements and the architectural features of rural buildings.

The four invariants are reflected in all the 20 landscape units, and each unit is described in a specific chapter of the plan, taking into account the values and the criticalities for each invariant, as well as the landscape quality objectives and the rules for the management of the territory. Each chapter contains also a set of diachronic land-use maps starting from the cadaster of 1823, as well as geological maps. Maps are an integral and important part of the landscape plan, including the map of the “Historical Rural Landscapes of Tuscany”, which takes into consideration the national register of historic rural landscape developed by the Italian Ministry of Agriculture [28]. This map intends to highlight the origins of the Tuscan landscape, in order to increase knowledge of the territory, favoring the restoration and the protection of important historical features.

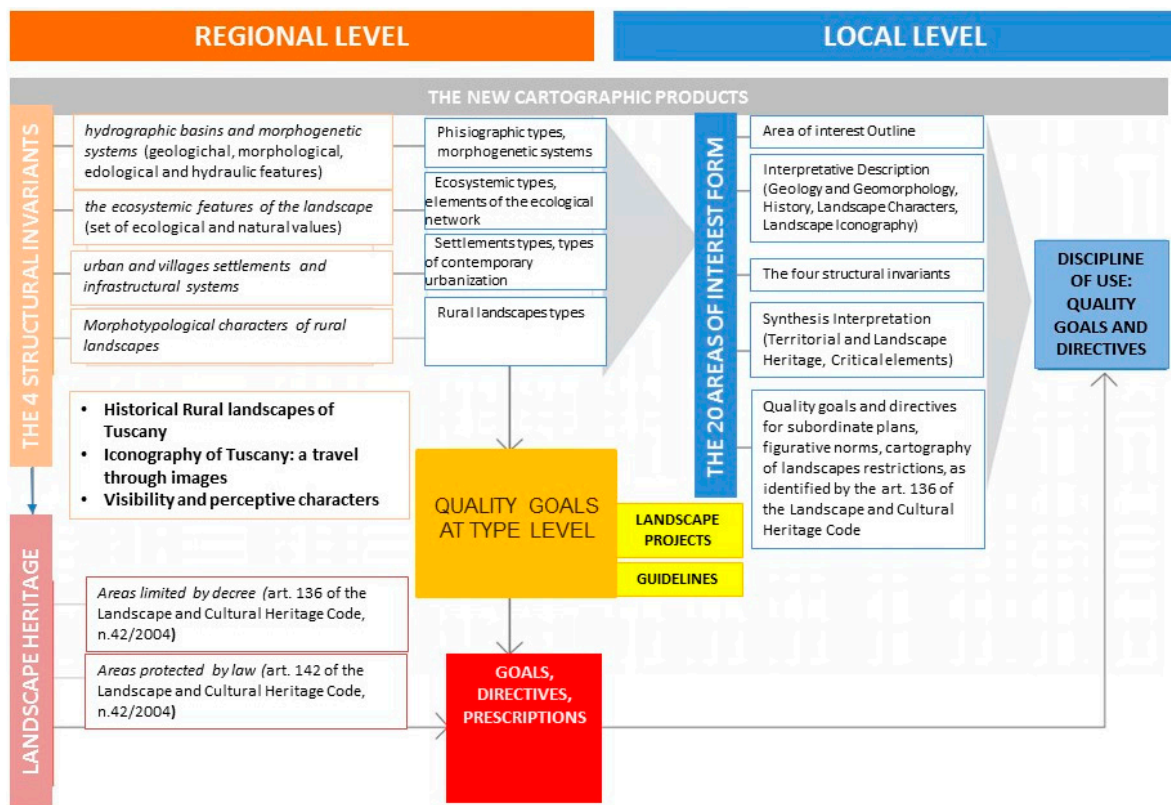


Figure 3. The structure and components of the landscape plan of Tuscany.

Finally, the plan contains the discipline of use, a fundamental document for what concerns the application of the protection system put in place. This document contains for each landscape unit, the categories of elements directly protected by the national code for cultural heritage, as well as the prescriptions deriving from the hydrogeological law of 1923, the Forest Law of 2001, and the restrictions due to the presence of protected areas. The plan has also incorporated modifications to the national forest law 227/2001 [29], allowing the restoration of previously cultivated land as well as forests having historical features and the identification of historical rural landscapes.

3.2. The Forests in Tuscany and in the Landscape Plan

As for most of Italy, the current forest cover in Tuscany is the result of secondary successions that have occurred on former cultivated areas [30], about 400,000 ha of the 1,196,992 (33.4%) of forests results from this process, with an estimated increase of 6000 ha/year. Also direct re-forestation with conifers carried out during the 20th century has contributed to the increase of forests in Tuscany, as in the rest of Southern and Central Europe [31].

Historically the most forested areas were not the mountains but the hills, as mountain areas were quite populated with large areas of pastures and cultivated areas up to 1000 m a.s.l. Tuscany has the highest percentage of broadleaved forests in Italy, representing 78% of the total forest. Concerning ownership, 80% is private property, while public property is about 14%; this includes regional property and woods owned by municipalities (Table 2). The Tuscan regional government is the largest forest owner of Italy [32].

Table 2. The features of Italian forests show the prevalence of coppice woods as a management form. This is due to the better integration of these woods with the needs of agriculture and the high request of fuelwood and charcoal. Today coppice woods are reducing due to decreasing economic interests and to nature conservation strategies limiting this kind of management form. The data of Tuscany includes shrublands and the cultivation of trees for wood production on agricultural areas [24].

Total Forests	Forests in Italy	Forests in Tuscany
	11.778.249 ha (39% of Territory)	1.208.820 ha (53.4% of Territory)
Private property	63.5%	80%
Public property	32.4%	14%
Management—Coppice	42%	63%
Management—High stand	36%	18%
Broadleaved	80%	84%
Conifers and mixed stands	20%	8%

Wood production represents a small portion of the GDP of the region (0.25%), fuel wood represents 80% of the production, while the internal production of timber covers 38% of the needs of the timber industry. Although this may seem a low percentage, it is a much higher percentage compared to the rest of the country. However, the economic values of all the services associated with forests raises to 6% their role in the GDP and forest services associated to the landscape make up about 76% of their total economic value. This explain the importance given by the landscape plan to forests. In this respect, forest management is considered a fundamental activity for the conservation of the values associated to forests, not only for biodiversity, but also for reducing hydrogeological risk, in particular decreasing erosion and increasing slope stability. This choice is in line with the indications of the national forest framework program and the idea of promoting an active forest management strategy in opposition to previous views suggesting limited or no silvicultural interventions.

In Tuscany there has always been a strong integration between agriculture and forestry (Figure 4), and it is demonstrated by the fact that coppice is largely the most common management form. In fact, assortments coming from coppice were, and still are, of utmost importance for fuel wood production, farming activities and for everyday life in farmhouses. Small beams were used for building roofs or to tie the vines to their support, or to build baskets for food transportation; poles were used in the vineyards, while pollard coppice, an aerial coppice resulting from the cutting of trees a couple of meters off the ground, provided leaves for fodder.

Concerning high-stand forests, one of the best examples of forest type explaining the relationships with agriculture and the life of the population are the chestnut orchards. These forests, for many years were inventoried as agricultural cultivations because the main purpose was the production of nuts to feed the population. They were particularly important in the mountains, as competing territory to wheat since the calories per hectare produced was often higher. Moreover, chestnut trees produced leaves for feeding livestock, bark for tannin, wood for charcoal, poles and fuel [33]. Furthermore, grazing was associated with these forests given the need to keep the ground under the trees clean for harvesting the chestnuts. At the same time the chestnut orchards, 13% of the total of Tuscan forests, although reduced to one third of the extension existed one century ago, still play a fundamental role in the cultural heritage of mountain communities. Many of them present monumental trees, with plants 200 to 300 years old. Another important type of forest strongly related to agriculture were oak forests, which represent today about 60% of the forest of Tuscany. In the past they were commonly used for grazing, especially for pigs, so that the economic reports of the large farms existing all over the region used to value oak forests according to the number of pigs that could be raised.



Figure 4. The Tuscan landscape is made of a mosaic of different land uses including forests, farmed and grazed land as well as rural settlements. The main task of the landscape plan is to maintain the quality of the landscape harmonizing economic, social and environmental processes.

The extension of the different forest types does not fully explain the values associate to them, as some forests may have a very high value in terms of landscape quality or for their historic significance compared to their limited extension. This is the case of the *Pinus pinea* forests along the coast, planted between the 18th and 19th century, after the land reclamation, that represent only the 1% of the total forest areas. However, the peculiar architecture of the crowns, as well as the age and the location of the stands, assign them a fundamental role in the quality of the coastal landscape also for recreational purposes. Similar observations can be made for the fir forests around the abbeys of the Appenine range, where the monks promoted even-age stands applying clear cuts and artificial regeneration already by the 17th century. Monasteries played a fundamental role in the conservation of the knowledge about agriculture and forestry during the dark ages after the fall of the Roman Empire and until the renaissance of Italy. Also, for these reasons the Abbey of Vallombrosa became the headquarter of the first Italian school of forestry in 1869, and today it is still the main center for the field work of the forestry courses held at the university of Florence.

3.3. Critical Analysis of the Interaction between Forest Plans and Landscape Plans

In the landscape plan, the forests of Tuscany are described in the invariant “ecosystemic feature of the landscape”. The methodology adopted by the plan follows the approaches of landscape ecology taking into account matrix and patches, interpreting the Tuscan landscape as a complex mosaic, characterized by the forest and agricultural matrix and their connecting structures, contributing to the regional ecological network. The ecological network organizes forests into primary and secondary nodes connected by corridors, the first having a surface of at least 1000 ha and the second having a surface between 100 and 1000 ha. Forest matrix have been divided into a matrix having a high connectivity and lower connectivity, considering the potential ecological value associated to focal animal and plant species, and to the age and structure of the forest stands. Generally, high stands have been considered as playing the role of a matrix, while low forests, basically coppice woods, have not

been considered as a matrix. Other matrices not classified as forests (pastures and cultivated areas) have been assessed according to their suitability to host focal species, but agroecosystems have also been considered as the repository of biodiversity especially when associated to traditional practices.

In the chapter describing the ecosystem features of the plan, together with the description of the different types of ecosystems, vulnerabilities and criticalities have been assessed, as well as dynamics and quality objectives for each matrix type and for the knots of the ecological network. The indications concerning vulnerability and criticalities have been transferred into the discipline determining use, becoming a list of rules to be considered in development plans proposed in these areas. Nevertheless, according to the national laws, the landscape plan has allowed the restoration of previously farmed and grazed areas and of specific forests, in order to find a balance among the functions played by the different land uses contributing to the uniqueness of the Tuscan landscape.

The importance given to the forest landscape is confirmed by the establishment of the landscape park of the Apennine mountains, near the Benedictine abbey of Moscheta, today listed in the national register of historical rural landscapes. However, the development of this initiative is a good example of the tensions existing between the different planning levels, especially forest planning in protected areas. This park is included in a Site of Community Interest, created according to the EU HABITAT Directive, requiring member states to identify natural habitats to be protected in their territory. The original management plan of this site, was made according to a phytosociological approach, indicating potential vegetation types as the goal to be achieved through management. As a matter of fact, the area has been cultivated since the year 1037 and most of the vegetation is now characterized by secondary successions on abandoned pastures and chestnut forest and conversions of beech coppice to high stands undertaken in view of favoring renaturalization. The conflict between the historical evidence on the ground and the planning approach of the protected area has been solved adopting a different management strategy in a portion of the area, dedicated to the conservation and restoration of the historical landscape. From a technical point of view the regional landscape plan considers the management plans of the protected areas as a higher level of protection, usually approving these lower planning level. Only the intervention of the local communities, as in this case, can sometimes change the general approach adopted in protected areas.

Concerning the regulatory framework, forest management is under the rule of the landscape plan. Therefore, forest management plans, as management forms, such as coppice woods or high stands, are regulated by the landscape plan. For each one of the 20 landscape units, a specific regulatory framework has been set up, indicating the forest features to be preserved and the indications for the forest management plans. According to the legal value of the landscape plan, the lack of a landscape authorization for forest cutting, depending on the case, can be considered a criminal or an administrative offense. The higher value of the landscape plan compared to forest planning has in fact created conflicts between the forest sector and the planning sector.

Due to this approach, the landscape plan does not always match the historical and cultural features of the forest, since all of them have cultural features that have been maintained through forest management forms such as coppicing. As a results, although coppicing is the most extended management form, in seven landscape units, out of the 20 in which the region has been divided, coppicing has been considered as a danger to forest conservation. This has created a tension between forest management plans and the landscape plan.

3.4. The Regional Landscape Observatory

The landscape observatories are institutions required by the European Landscape Convention and promoted by the National Code for Cultural Heritage, that each Italian Region, together with the landscape plan, should establish. The observatory of Tuscany was established by the law n. 65 of 2015 and started the activities in November 2016. A president, a secretariat and a board composed of 21 members, forms the structure of the observatory.

The board is composed by people coming from different institutions: 6 from the regional planning observatory, 2 representatives of the municipalities, the director of the regional planning department, the director of the Geographic Information System, the representatives of the four main Italian environmental non-governmental organizations, 2 experts designated by the network of the Universities of Tuscany, 1 representative of the association of Italian architects, 1 representative of other technical associations of professionals in the field of landscape, the director of the landscape office, the director of the culture office, and the representative of the agricultural department.

The president of the observatory is directly nominated by the presidency of the regional government. The term of the board expires after 5 years, usually when regional political elections occurs. The main activities of the observatory are the following:

- Collect all the information related to the Tuscan landscape.
- Promote participation among the population, particularly establishing a network of local observatories.
- Elaborate proposals for the implementation of the landscape plan.
- Promote the Tuscan landscape.

Since 2016 further activities have been assigned to the observatory, such as the monitoring of the efficacy of the plan, the implementation of the state of knowledge, the evaluation of the coherence of the activities of the regional departments and of the quality of the landscape projects developed in Tuscany. The observatory has also established a landscape prize and elaborates a report on the state of the landscape in Tuscany every two years. The observatory acts like an independent institution inside the regional government, although it has stronger links with the planning department.

The observatory carried out some important initiatives in 2017:

- A monitoring system of the rural landscape has been set up, based on 20 fixed study areas, one for each landscape unit, to monitor changes of land use and of landscape structure through a methodology capable of analyzing in detail the fine structure of the Tuscan landscape.
- The creation of rural landscape parks, trying to counterbalance the degradation affecting the agricultural landscape due to industrialization and abandonment, not by imposing limitations or environmental protections but by promoting actions to support farmers and farming practices maintaining the quality of the rural landscape. This initiative integrates with the National Register of Historical Rural Landscapes and with international programs such as the FAO Globally Important Agricultural Heritage Systems (GIAHS) and the UNESCO World Heritage List.
- Organization of a workshop to develop policies for drystone terraces. Tuscany has about 9800 km of drystone terraces, severely affected by abandonment. Dry stone terraces, as well as earth terraces, were also used in forestry for reforestation projects and for chestnut orchards. Terraces have been the only way to cultivate land in many places due to the regional morphology, and they represent a fundamental feature besides the reduction of hydrogeological risk. The workshop presented a state of the art report and promoted a collaboration between different regional offices on this topic. Dry stone terraces represent multifunctional agricultural systems all over the world, so that they have also been the subject of several presentations during a session on agricultural heritage systems and their contribution to climate change mitigation and adaptation at the last COP23 (United Nations Climate Change Conference of the Parties) in Bonn.

4. Conclusions

The development of a national landscape law and the incorporation of landscape into rural development policies, in both of which Italy and Tuscany have been pioneers in Europe and the world, marked an important achievement in the recognition and protection of a fundamental resource of the country.

Considering the above it is possible to summarize some positive key aspects, that can be proposed as examples and reproduced in other parts of the world:

- Policies on landscape carried out by three Italian ministries (culture, agriculture, environment) during the last decades have not always been entirely successful or consistent with each other. The National Code for Cultural Heritage requiring regional landscape plans, must be considered an important achievement in the attempt to protect and valorise landscape resources through a set of legally binding norms coordinating and harmonizing economic development, landscape quality and society.
- According to the European Landscape Convention, landscape has been put among the objectives of the agricultural policies in the NSPRD 2007–2013. Although the CAP indicates the conservation of landscapes and biodiversity as one of the objectives, landscape is currently only mentioned among the elements that can be preserved inside the “ecological focus areas”. In the case of Italy, rural areas are no longer considered simply as a place for food production, but as complex systems where different activities contribute to development and where the concept of quality applies to the entire landscape.
- The features of the Italian territory have not allowed promotion of the diffusion of a competitive agricultural and productive model based on high yields. The alternative to industrialization in agriculture has been found in the uniqueness of the rural landscape. An economic model based on quality food and tourism and agriculture with low energy input is more effective for marginal areas on mountains and hills, compared to intensive agriculture. Between 2009–2013, the worst year of the recent economic crisis, Tuscany lost 22,000 workplaces in industry and 12,600 in services, but had an increase of 10,000 workplaces in tourism, while arrivals in rural houses and farms increased by 14%. From 1997 to 2014 there was an increase of about 380% in the number of accommodations in rural houses and farms.
- Since landscape is nowadays perceived by stakeholders and farms as a fundamental resource for the development of rural areas, landscape restoration must be supported to preserve the characteristic features. In 2017, the department of agriculture of the regional government allocated €10 million for projects to be developed by groups of farmers. The total amount of requests was equal to €39 million, many of them for the restoration of dry stone terraces.
- The Ministry of Agriculture, Food and Forestry Policies established in 2012 a National Observatory of Rural Landscape, Agricultural Practices and Traditional Knowledge that has the task of setting general guidelines and strategies for the adoption of specific measures aimed at safeguarding, enhancing, planning, restoring and managing the rural landscape. Moreover, it is in charge of monitoring the effects of agricultural policies and environmental and socioeconomic dynamics on rural landscapes.
- Together with the observatory, MIPAAF established a National Register of Historical Landscapes. The scope of the register is to identify and catalogue traditional rural landscapes or landscapes of historical interest connected to traditional practices and knowledge, defining their significance, integrity and vulnerability. In these areas, farmers play the central role of landscape managers. Considering the common goals of the National Register and the FAO GIAHS program, Italy has developed a memorandum of understanding with the FAO promoting cooperation on this topic.
- For the first time the quality of the landscape, particularly the rural landscape, has been introduced among the indicators of the wellbeing of the population by the National Statistical Agency (ISTAT), in collaboration with the National Observatory of Rural Landscape. These indicators of wellbeing are part of an effort to go beyond the usual GDP and other economic indicators in an attempt to develop a better view of the progress of society. The introduction of the quality of rural landscape among these indicators means that landscape has been recognized as a fundamental aspect of the quality of life.
- The peculiar geographical situation of Italian territory, where mountains and hills are very fragile and 500,000 landslides occur every year, requires forests not to be abandoned but actively managed in order to reduce hydrogeological risk. Management is also needed to support biodiversity,

which is another fundamental asset of the country, and the production of timber and wood for energy, where this is economically viable.

- The production of quality food with Protected Designation of Origin, as well as organic products, has been steadily increasing in the last few years. Italy is the country of Europe with the highest number of labels ensuring customers that food is coming from the place of origin, as well as the first country for organic products. In this context, together with agricultural landscapes, the conservation of a variety of forest landscapes, ranging from dense forests to wood pastures and grazed areas inside the forest, supports high quality food production and landscape diversity.
- Global challenges on various topics (climate change adaptation and mitigation, biocultural diversity, environmental and landscape degradation, territorial governance, and sustainable development goals) suggest a change from a purely ecosystem approach to a landscape approach, where man is not a disturbing factor but a central element for the quality of the environment. In these terms, the concept of biocultural diversity adapts to the Italian landscape, and it is slowly taking place in all Europe.

Together with important success in the development of landscape policies, there are also areas where it is important to increase efforts and improve effectiveness:

- There is the need to better integrate the multi-sectorial policies of territory planning, which can have a direct or indirect impact on rural landscapes. At national level one of the main difficulty is to transfer general planning indications at the operational level. Each ministry has its own structure and operational programs; the Ministry of Culture through landscape protection and of the Ministry of Environment through nature conservation, basically operate applying restrictions on landscape and natural values. These restrictions are almost ineffective or can create conflicts when applied to rural landscapes. Protection has been effective in reducing soil consumption and urban sprawl, and protecting wildlife, rather than rural landscapes, that require local and specific strategies.
- More interdisciplinary cooperation is needed in scientific research. Landscape planning and management require an integrated, multi-disciplinary approach. This process of integration is hindered not only by the separation of the administrative skills attributed to the different institutional bodies, but also by the rigidity and the divisions between the different disciplinary domains, partly deriving from academic traditions.
- Fostering conservation and innovation. Some of the landscape strategies proposed by the landscape plan of Tuscany encountered a certain resistance, especially when challenging big landowners, or the agro-industry. While there was a broad consensus on the need to have a plan protecting a fundamental resource, some productive sectors (especially the owners of the marble quarries in the Apuan Alps and the big wine producers in Chianti) raised some concerns about some of the orientations and restrictions of the plan. There is a need to encourage both conservation and innovation in rural territory, since the opposition between the two is a false problem. Innovation always occurs through the re-elaboration of values accumulated in the past, while conservation also creates new values.
- Landscape perception and education. The urban population, although in favor of quality food and landscape conservation, often have limited knowledge and a different perception of the difficulties of cultivating the land, of the rural economy, and of the origin of rural landscape,, often interpreting as “natural” areas that have a cultural origin. On the other hand, farmers should take care of landscape quality, as the reasons why they sell products and the fundamental importance of tourism in the rural economy are based on the quality of the landscape.

The case of Tuscany shows that the efficiency and effectiveness of rural development policies depend crucially on the possibility of connecting them with landscape policies, or more precisely with the territorial policies of the different sectors that may be found in a landscape, widely speaking, as a strategic framework of reference. This is the main point of contention between collective interests

and rights, on one hand, and individual privileges and interests on the other. It is especially—but not only—here, that the rural development policies and areas deserving special protection are to be integrated in urban, territorial and landscape planning in order to face the challenges arising on the new frontiers of sustainable development.

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